TEE ONE TOPICS

(An occasional bit of bumf distributed among owners and others interested in the maintenance and care of Proper Motor Cars)

Number 5 August 200I

Disclaimer

The Tee One movement is not in any way affiliated nor associated with the Rolls-Royce Owners' Club of Australia nor any other organisation. Its aims are to spread knowledge and information about proper motor cars that would not normally appear in club journals nor any other publications readily available to the public.

The knowledge of owners and enthusiasts that is shared in these gatherings is offered/received without any form of guarantee or authority. Individuals are solely responsible for their own cars and actions and the use to which they put the information gained.

OUCH!

Well the day started with a bit of sadness with news from Murwillimbah that a nice looking Shadow II had ditched itself. As the pictures show the front left hand corner copped most of the impact and from what I could see you would be up for over $30K just to get the obvious parts.

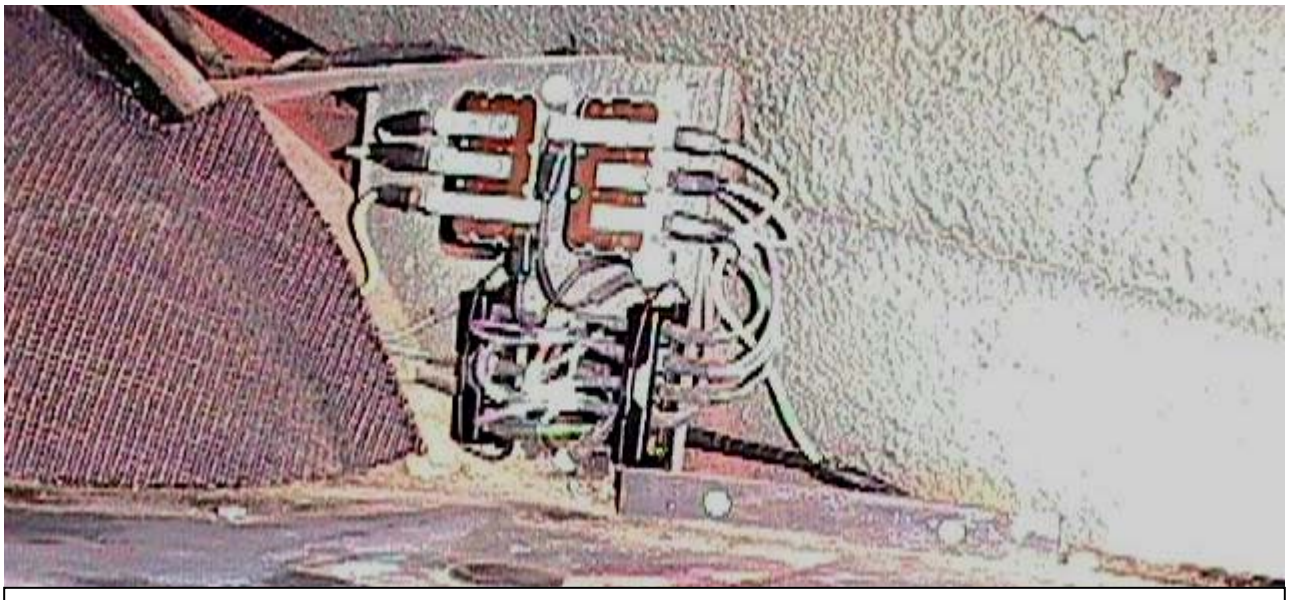
The haunting thing is that in 30 years time someone will see that and groan that we wrecked it. It used to happen to Mark VI's now they are actually building smashed chassis side rails to get those cars back on the road.

STOP LIGHTS *versus* INDICATORS

As best I remember, the first mass-produced car to carry winking turn indicators was the Renault 750 a few of which still turn up at Wheels. This tiny four door four seater car also had the weirdest idea - a steering column lock and ignition key combined! What silly ideas the French have eh! All Europe, the French included used the cute little lighted trafficators which frequently could only be seen if you were a little to the right of the centre line of the car displaying these semaphores. Hand signals were certainly the order of the of the day including the extraordinary turn left signal devised by the

The flasher relays for the fog lights fitted to an S2. The flasher units are located above the steering column behind the dash panel

Tasmanians. The first Holdens (1948) which I remember well as my father had number 49, had no signalling equipment other than a stop light neither did his 1948 Chevrolet Stylemaster. All British cars continued with the trafficators until some European manufacturers started using the winking light system. About 1954 the Factory offered kits to fit the winkers to existing cars and some coachbuilt cars fitted them as new equipment. At this time an actual international agreement was reached limiting flasher bulb size to 21 watts and a standard flashing rate of 90 – 120 per minute.



The flasher relays for the tail lights fitted to an S2 and normally hidden behind the right hand boot liner

From a marketing point of view motorists were still inclined to be startled by the winkers but gradually the message got across and today if you want to see a startled driver following you just flick out a trafficator and wait for the crash! The conversion of trafficators required using the stop

HAPPENINGS

19th August 2001. **Tee One Meet**.

Where: Bill Coburn's home (24 Jelbart Street Mawson)
When: 0800 hours (8.00 a.m.)
Who: You, your family and your car
Why: Run to Corin Park for a great breakfast and an enjoyable drive.

1st of September 2001. **Wattle Day Celebration**.

Where: Botanic Gardens
When : 1100 hours (11.00 a.m.)
Who: Anyone who wants to celebrate the "other Australia Day"
Why: Well, we are informally inviting some Legacy Widows to a picnic at the Botanic Gardens. It will be a "bring your own everything" day and for those who are kind enough to volunteer to host a widow or two, a further impost of goodies for them too.
Please note. Wear green and gold and some wattle sprigs. Should be a great day!

***** Ring George on 02 62553366 if interested in hosting a widow or two. Thanks.**

Late September 2001. N.S.W. Self Help Meet.

More information nearer the day. Automatic Transmission oil and filter changes will be the theme. Mad if you don't include yourself.

20-21st of October 2001. **Cooma Car Club Alpine Fun Run**.

Where: Royal Hotel Cooma.
When: 0900 hours (9.00 a.m.) Saturday 20th of October.
Who: All wanting to spend a nice weekend touring the Australian Alps.
Why: You deserve it!!!

*** Contact George as soon as your eyes see this, on (02) 62553366 and he will contact the organisers. Details on request. Similar route to the Tumut Run a couple of years ago so it should be a good week end. Hope you can make it.

lights at the rear and either the existing parking light or as some countries required, a separate light usually fitted to the leading edge of the front mudguard. This was the scheme used on the Mark VI and R type Bentleys and the Silver Dawns including the 'E' series. The stop lights posed a problem in switching and required a relay to disconnect the relevant stop light and through a separate circuit have the light flash. Similar switching was required at the front of the car if the normal parking lights were used for signalling.

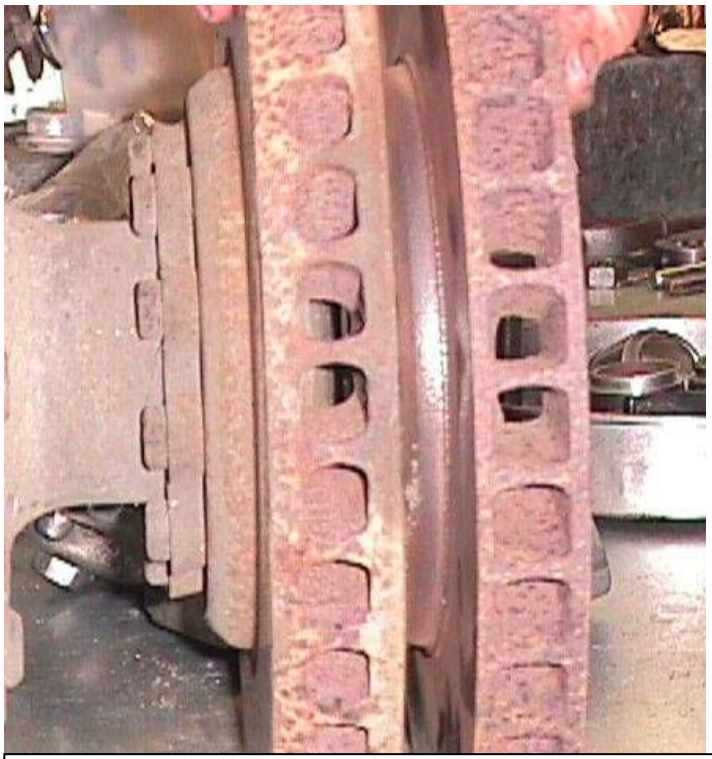
The Silver Cloud and S Series Bentley further developed the relay switching system using the seldom used fog lights as front end signallers and rather than use a fairly complicated single unit Lucas relay system from the previous model, separate relays were used for each side with standard flasher units. Life became much simpler with the advent of the Shadow which used separate lights and circuits with a simple switching system.

Disc Brakes of Australia who make solid brake rotors for Shadows but not the ventilated ones published the following which I found of interest.

Oddball Facts & Figures

Automotive brakes have benefited from over 100 years of development, transforming them from the crude and near-useless devices of yesteryear to today's reliable and efficient, electronic anti lock braking systems. Here's a few facts and figures collected on the long and fascinating path...

Volvo introduced asbestos-free clutch and brake linings to its cars as long ago as 1986. Another feature the same company brought to a wider Australian market: "twin triangular" dual circuit brakes. They came with the Volvo 140 in April 1967.



An appalling piece of maintenance. The brake rotor on the right has been ground way beyond the minimum permitted. The rotor on the left is of original dimension

Disc Brakes Australia (DBA), this country's only after market manufacturer of disc rotors, supplies products for 96 per cent of the disc-brake equipped cars, light commercials and recreational vehicles on the road. To put that in perspective, it still manufactures rotors for such obscure disc brake-equipped vehicles as the Leyland P76, Triumph TR3A convertible, Rambler Javelin, Lada Sable, Humber Snipe and various early model Rolls-Royces.

The first disc brake appeared in 1902, though it could hardly be described as practical. Widespread interest in automotive disc brakes didn't come about until the 1950s when Jaguar used them to devastating effect at Le Mans. In the 1953 "24-Hour", Jaguar C-Types - fitted with discs developed by Dunlop - finished first, second and fourth.

Early braking systems were usually hazardous. When Richard Lean of Lithgow, NSW, built a motor car in 1901, the local police chief insisted on being taken for a drive to ensure the car was safe. A contemporary report from The Lithgow Mercury stated that when Lean was ordered to hit the brakes "there was a jittering screech of iron on ground and then the strangled bellow of the sergeant as he sailed cleanly over the top of the motor and sprawled on his stomach in the dust"

The Shadow ventilated rotor fitted to the front hubs is fabricated in two pieces, the inner mount which is crimped onto the outer ventilated disc. In another publication light was given to the event of the two becoming separated through corrosion. Fortunately this has only occurred in cars imported from the tropics.

Australia's Felix Caldwell was a pioneer of four-wheel drive and all-wheel steering, and fitted four-wheel brakes to a road vehicle as early as 1910. Although four-wheel brakes were also used on a few racing cars before World War One, they didn't become near-universal until the 1920s.

The hydraulic brake system - which uses fluids to distribute to the wheels the force applied to the brake pedal - has been around since the 1920s and became common in the 1930s. Today all cars use hydraulics for their normal braking, though most parking brakes are still cable operated.

To counter Jaguar's disc brakes at Le Mans, Mercedes came up with a novel solution. Its W196S racing sports car (produced for the 1955 season) still had "drums" but incorporated a large metal wing behind the driver designed to rise during braking. Although this "wind-catcher" did help slow the Mercedes, it caused other problems and the idea never really caught on.

During a test undertaken by Williams-Renault, a Formula one racing car took just 18 metres to brake from 100km/h to a standstill. During the same test, an exotic mid-engine sports car recorded a distance of 40 metres and an everyday hatchback recorded 46 metres. The race car's main advantages include its wide and sticky "slick" tyres, its huge carbon-fibre disc rotors and its massive calipers and pads.

The Renault 8 of 1962 had disc brakes on all four wheels, a world first for a popularly priced car. The first mass-produced Australian car to have "discs all round" was the 1973 Ford LTD/Landau.

Anti lock brakes (also called anti skid brakes and ABS) are nothing new: they were tried on trains in 1908 and at least one sophisticated anti lock system was patented for cars before World War Two. Not until the 1950s, however, did serious automotive development take place. ABS was not widely fitted to road cars until the late 1980s.

Why not Formula One-style carbon-fibre brakes for road cars? Firstly, because a set of four Formula One disc rotors are worth more than the entire cost of most road cars. Secondly, because they aren't even slightly practical. To quote veteran racer Martin Brundle: "carbon-fibre brakes simply don't work until you've got a minimum of 400 degrees Centigrade, and preferably 600".

Silver Shadow Brake Rotor Dimensions

Nominal thickness of new rotor - **1.250 inch**

Minimum thickness permitted after grinding - **1.180 inch**

The 1996 Lotus Elise roadster became the first road car to use aluminium disc rotors. These rotors (which uses silicon carbide reinforcement) weigh about half as much as cast-iron equivalents and boast better thermal conductivity. The major down side is the high cost. In Australia, a joint research project between Disc Brakes Australia and Cyco Systems Group is investigating using a cheaper and more durable aluminium-ceramic composite rotor for normal road cars.

According to recent General Motors statistics, an airbag deploys every 175 "vehicle years", while a panic stop utilising antilock brakes occurs once each vehicle year.

To put racing car capabilities in context, a high-performance road car will record a braking force of about 1G during extreme braking, but in Formula One the deceleration forces can be in the order of 3.5G. That's enough to bring a driver close to blacking out, to distort his eyeballs (and consequently blur his vision), and to increase his effective body weight to 270kg.

BACK TO SCHOOL

Recently a friend sold his Silver Shadow to a gentleman who considered he had the very best advice available to him. In the event, he claimed that the tyres fitted to his newly acquired car were under rated and unsafe. The tyres fitted were Bridgestone SF 375 235x75x15 capable according to their rating of carrying a 4 tonne car at speeds in excess of 180 kph. The contention was that the ONLY tyre that could be fitted was the Avon 235x70x15 which apparently has an even higher speed rating. The catch here is that an unwary owner can be convinced that the factory advice must be followed. Unfortunately the general opinion of Avon tyres is that they don't seem to like Australian conditions and wear at a considerably higher rate than other suitable tyres such as Bridgestone. They do apparently give a nicer ride but clearly at a cost.

Quite separately, argument has raged over the past 35 years as to whether radial tyres should be fitted to a Cloud/S series car. The factory won't have a bar of the idea and some high priests hold that this is a clear indication that the tyres are NOT suitable for the cars. Actually what the Factory said was

that they had no experience with the fitting of radial tyres to these cars and with the litigious climate we live in these days they are not about to make a pronouncement on such a conspicuous safety aspect without an awful lot off empirical evidence gathered by themselves! And so most owners use tyres usually fitted to Silver Shadows. They get a very much better mileage out of them, better road holding and certainly better directional control. Personally I fit the factory recommended and very expensive Avon crossply tyres for originality but mainly appearance since radial tyres do make the car look lower. That is my choice!

At any rate I found among some of my son's notes the following which is a bit technical but should widen the thought patterns on the subject of road holding.

TYRES FOR WHEELED VEHICLES

The Pneumatic Tyre

The pneumatic tyre provides the only contact that a vehicle has with the ground. Through it alone must be transmitted tractive forces for acceleration, braking and negotiating gradients, and lateral forces for cornering and on side slopes. Besides maximising these control forces, it will also be required to attenuate the vertical disturbing forces from ground irregularities. It must achieve all this on both paved surfaces, wet or dry, and off-road under a variety of soil conditions. It should not limit the vehicle speed, either by excessive rolling resistance or over-heating, nor should it incur excessive fuel consumption. Not surprisingly, the tyre is a complicated component and compromise between the many conflicting requirements is necessary.

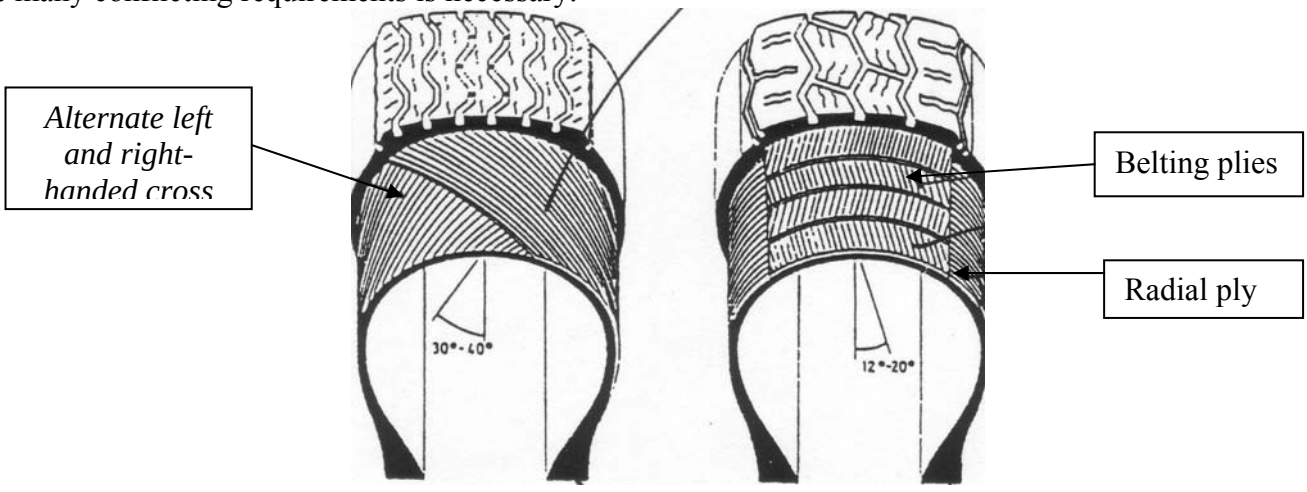


Figure 1. Tyre carcass construction.

NEW SPARE PARTS SOURCE

Conduit Components Pty Ltd have opened in Melbourne and have acquired a wide selection of stock of parts for Post-War cars.

The premises are at 386(A) Clarendon Street South Melbourne 3205.
Phone 03 9682 8400
FAX 03 9682 8244
Email spares@conduitcomponents.com.au
Contact Ross Pyke

Construction

Tyre build starts with a pair of hoops wound from steel wire. These "beads" form an inextensible base which will remain tight on the wheel rims under inflation pressure and hence transmit cornering, traction and braking loads to the wheel. Between them are laid a number of sheets of reinforced rubber (plies) to form the carcass, every ply wrapping once around the circumference. Each ply consists of an array of unidirectional cords set in a rubber matrix. The cords may be of rayon, polyester, nylon or steel.

For many years construction consisted of plies, all of which ran the full width from one bead to the other. To give strength both in the circumferential and radial planes, the cords had to run at a compromise angle between these extremes, typically with a crown angle of 350 (see Figure 1). For symmetry, an equal number of left and right handed plies was used, as many as 12 on large commercial tyres. This construction is known as 'cross ply'.

The radial seeks to overcome the compromise, inherent to the design of the crossply between the need for compliance in the sidewalls under vertical load (for a soft ride) and stiffness in the crown under lateral load (for positive handling). This is achieved by separating these two functions. No more than one or two full width plies are used, with their cords running in the radial plane (radial plies) together with a larger number of plies (perhaps 4 or 6) confined to the tread area and with their cords running nearly circumferentially (belting plies).

HELP!

Has anyone any suggestions? This is the 'out' end of the ducting on an S2 Bentley that commences below and beside the driver's seat and thence into the underwing air conditioning unit. The daggy thing hanging on the end of the duct is a rubber expansion moulding that allows movement between the fixed duct and the underwing unit. For reasons best known to someone in the Factory some 40 years ago this was neither listed as a spare nor does it even appear in the spare parts catalogue as an illustration. I have been advised that a solution is a short length of a suitable truck inner tube but it would be nice to get the original item. The seal has an 'omega' i.e. Ω cross section.

This reinforcement of the crown area brings with it further advantages, over and above the better handling. Because the tread is well-supported there will be less movement between rubber and road when the tyre flattens in the contact area, leading to less wear, especially in corners. Rolling resistance will also benefit, both because of this and the more flexible sidewalls. Ground pressure will be more evenly distributed, giving better grip both on-road and in soft going. Against this must be reckoned the increased vulnerability of the thin side-walls to accidental damage and penetration. Use of a flexible carcass allows inflation pressures to be varied widely according to the needs of the going.

The actual size of tyre (as opposed to its proportions), is designated by the section width and rim diameter, additionally, an indication of type of construction may be included e.g. 14.00 R 20

indicates a 14" wide radial tyre fitted to a 20" diameter wheel rim. For use on paved surfaces the requirement is for as large a dry contact area as possible between the tyre and road. The sole purpose of the pattern is to remove water from under the tyre by a dual process of bulk displacement through large grooves, followed by elimination of the remaining film by knife-cuts in the tread, acting as a reservoir.

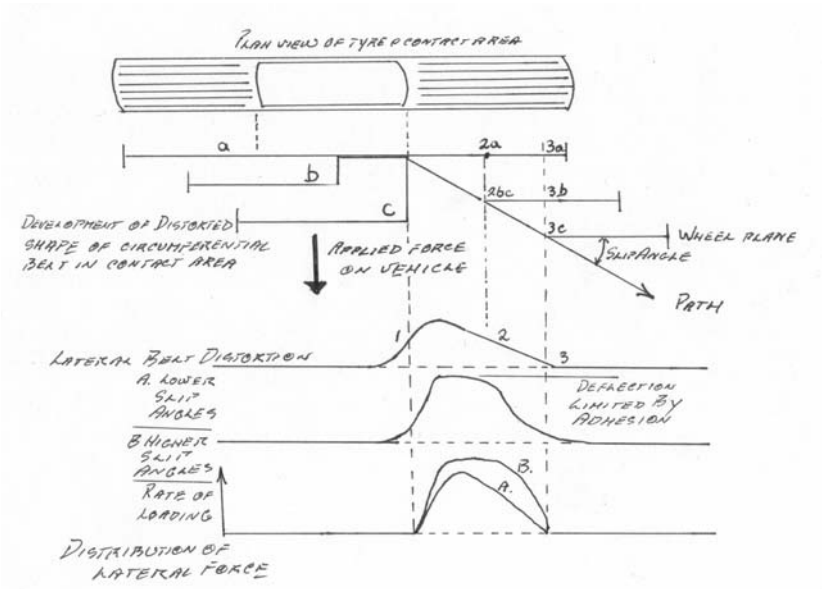


Fig. 4 Exaggerated diagram showing the behavior of a pneumatic tyre when cornering.

Handling behavior of tyres

In order to follow a curved path, or a straight path on a cambered road, a vehicle will require a lateral force to be applied to it through the tyres. It is the way that its pneumatic tyres respond to a lateral force, that principally governs the handling behaviour of a vehicle. This will now be examined.

Figure 4 shows the plan view of the circumferential belt of a rolling tyre. This is simplified in the view below to a single line representing just the circumferential hoop in the central plane of the tyre. The sequence a-c depicts this hoop as it rolls to the right, and follows the history of 3 points 1-3 after a lateral force is applied to the tyre in position a. At the start of the sequence, point a is about to contact the ground; points 2 and 3 are clear of the ground in front of the contact area, and lie on the same undeflected straight line as 1. What happens next is that points, such as 1which are in the contact area, are maintained stationary by friction from the ground. However, the lateral flexibility of the hoop and side-walls means that points on the hoop that are still off the ground, such as 2 and 3, are deflected sideways in response to the lateral force applied by the vehicle chassis to the wheel.

Thus in position b, when point 2 is about to be laid on the ground, 1 (by now in the middle of the contact area), together with the rest of the contact area behind it, has been left behind by the lateral shift of the wheel above it. The deflected shape of the hoop within the contact area would now be trapezoidal in this idealised model.

Finally, in position c, the rear of the contact area has reached point 1 which, like point 2, is still stuck to the same point on the ground at which it first made contact. Point 3 is about to be laid and the now fully developed deflected shape is triangular; this shape is maintained thereafter. The result of this laterally compliant behaviour is that the wheel rolls along a path corresponding to the direction that the hoop within the contact area is laid, rather than the direction that the wheel itself is pointing. The angle between the two is known as the slip angle (although it has been seen that the tyre is not necessarily actually slipping over the ground). The magnitude of this slip angle is dictated, for a given force, by the lateral bending stiffness of the tyre belt (the contribution to lateral rigidity made by the sidewalls is relatively small). Thus on a side-slope the tyre tracks downhill; whilst cornering it will track out of the bend. This is analogous to the drift to leeward experienced by a sailing boat with the wind on the beam.

In practice, of course, the tyre belt cannot accommodate discontinuities like those shown at the start and finish of the contact area; a more realistic shape would he like that shown next in figure 4. This still presumes that friction is sufficient to prevent sliding occurring, even where the distortion is greatest, i.e. at the back of the contact area. As the lateral force is increased, there must come a point when this is no longer the case and sliding starts. This then progresses forward from the rear, as the force increases further, until the whole area is sliding; the idealised shape in this situation becomes a triangle, but now truncated by the limit on the deflection to form a trapezium.

As might he expected, the distribution of lateral *force* along the length of the contact follows the same general form as that of the deflection; initially approximately triangular until, with the onset of sliding, the limiting sustainable force is reached, the shape becomes trapezoidal. This is shown at the bottom of Figure 4. The area under this graph represents the total lateral force on the wheel.

The relationship between lateral force and slip angle, shown in Figure 5, follows from this behaviour. Initially the graph is linear until adhesion starts to be lost, when it falls away is progressively towards a limiting value of lateral force. The limit of linearity will not normally be reached on dry roads, except under severe handling manoeuvres, and thus the initial gradient can be used to quantify the tyre response. This is known as the cornering stiffness (C), the 1ateral force to cause unit slip angle. It will be affected by many parameters principal of which are:

Scintillas and Otters

With Winter well and truly upon us you should be sure that the Scintilla switch and the Otter switch in your car work. Quaint names, presumably from their manufacturer they were used on all carbureted cars employing automatic chokes.

A problem surfaced during the building of the R type Bentley and derivative (?) in that the choke butterfly valve tended to be sucked open during starting in very cold weather thereby reducing the effectiveness of the choke. This was overcome by holding the valve shut with an electromagnet. As this is not required in 'mild' cold weather the magnet is not energised until the circuit is closed by a bi-metal switch which closes at around

As fitted to the first V8's. The Otter switch is on the left

4°Centigrade. When the engine has got going the next task is to switch off the magnet. In the R Type this is done by a pressure switch on the main oil pressure relief valve. When oil pressure starts to rise the switch which is in the circuit with the Otter switch breaks contact and the magnet releases the choke. From memory this was found to be a bit quick for the engine which could stall through insufficient choke.

And so the Scintilla switch was introduced in lieu of the oil pressure switch. This has a heating coil which takes a while longer to warm up before breaking the circuit thereby giving the engine time to sort itself out.

The simple test to see if the system is working obviously done in very cold weather is to set the choke with the accelerator in the normal manner with the ignition on and try and open it with your finger using the small lever at the side of the air intake. If all is well there will be considerable resistance to your finger's efforts.

The whole setup incidentally can be over-ridden by flooring the accelerator which simply forces the choke open. Such a facility you would use in the event of flooding!

Vertical load

This is seen to have a non-linear affect, that is doubling the load does not double C. This has important implications when considering the effect of weight distribution on handling.

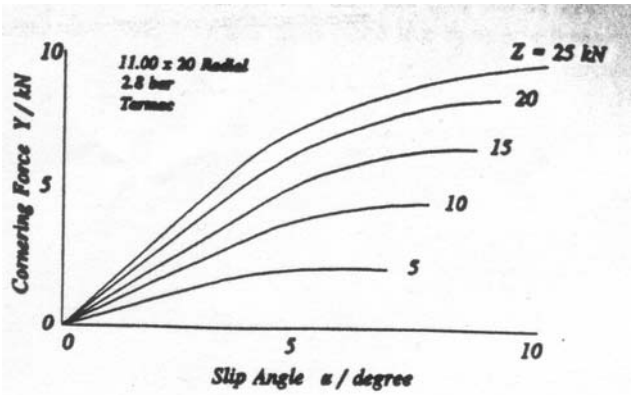


Fig 5. Relation between cornering force and slip angle

Construction

Radial ply tyres will be stiffer than cross ply; steel cord construction stiffer than polymer. Lowering the profile by widening the tyre will increase C.

Inflation pressure

Raising the pressure will increase C, provided this is not taken to excess.

Traction and Braking

The effect of accelerating in a corner is well-known to drivers; the end of the vehicle with driven wheels will run at an increased slip angle, that is C is reduced by the drive force.

A further facet of tyre behaviour can be deduced from the shape of the distorted contact area. Because distortion is greatest at the rear, the resulting side force will act behind the centre of contact. It will thus impose a moment about this point, which will be additive to that produced by castor, and is known as the "self-aligning torque".

An interesting discussion on DOT 3 Castrol RR363 Brake Fluid (Edited from the RROC(A) Web Forum)

One of the early aversions to using RR363 was its cost. Now, if you buy it direct from Castrol it is cheaper than most if not all other everyday brands. So why bother trying to find alternatives? And have you priced a bottle of water lately?

By **Kees Scherer**

Does anyone know if the new types of DOT4 brake fluids can be used in a Silver Shadow?
I still use the RR 363 but people keep telling that I can switch to newer types. (I do not want to mess with my seal...)

By **Don Beechey**

I have a 67 shadow that has had the brake fluid changed to dot4. My RR technician has assured me he has done this with many silver shadows without a problem. My car seems to be braking normally

without any problem. I live in Florida, USA where it can be very humid which is hard on RR363. I am in no way advocating anyone do this to their car.

By **Bill Vatter**

I believe it is always good to stay with what the factory recommends. Supposedly RR363 has better lubricating properties compared with other brake fluids. The most important thing to prevent major repairs to the hydraulic system is to change the fluid regularly, 2 years is not too often. Above all do not use DOT 5, which is silicone fluid. It can cause rubber parts to swell, and it would result in major expense.

By **Martin Cutler**

Most important thing to remember is not to mix types. If you are going to change from DOT3 to DOT 4, you need to completely flush everything out, clean it, and then it can be changed. Some of my friends have even had problems mixing different brands. The rubber brake lines on the front end will suffer from age, so might be a good thing to check. (I replaced mine on the MK VI, they where not very expensive.)

To follow on from Bills advice, do change the fluid regularly, if the car is used or not. Brake fluid absorbs water, and you will be amazed how rusty and dirty the inside of wheel cylinders can be. Reminds me I need to do mine!

By **Steve** on Sunday, March 18, 2001 - 11:19 pm:

I have never found out what the lubricating additive used in RR 363 is but I do know of vehicles using DOT 4 fluids that so far have not suffered any obvious problems.

My own feeling is that RR 363 is not required for any of the rubber components as they are compatible with standard DOT fluids and the rubber seals work in the same way as a conventional hydraulic system. The brake pumps however have no seals on the pumping elements. Instead they rely just on finely machined clearances to prevent leakage past the plunger into the engine, the minimal amount that should leak past provides the only lubrication. As they are camshaft driven they pump at half engine speed so one can easily imagine how any failure in lubrication would rapidly destroy the brake pump plunger clearances.

SAFETY FIRST WITH SHADOWS

You will be aware of the very little effort required to move the transmission selector on a Shadow. As nice as it is, it is just to easy to knock when working on the car.. For safety's sake remove the gear change cut out from the fuze board to avoid possible accidents.

Early Spirit's suffered from mineral oil consumption when the clearances between the plunger element and its bore were mismatched. Frequent topping up and unfamiliarity with Hydraulic System Mineral Oil resulted in many systems being contaminated with RR 363 or other DOT fluids. Contamination above a very small percentage was disastrous and required a complete system overhaul. At this time all unknown mineral system cars that passed through a RR workshop were routinely checked for contamination. The lead seals on HSMO reservoirs are embossed with a unique dealer number. Before they placed their mark they made very certain the system was clean. Adding

another DOT spec fluid to a RR 363 system should not have the same catastrophic effect.

DOT 5 fluids are compatible with the rubber components if they are fairly new but an additional complication would occur due to their relative compressibility. The brake pumps operate at half engine speed and pumping an unstable column of fluid at up to 2500 psi rules out its use. For the same reason vehicles equipped with ABS brakes do not use DOT 5.

I look after a large collection of cars and would never use DOT 3 because it absorbs moisture so quickly. The exception to this is RR 363 and although I would like to find an alternative no oil manufacturer will tell me they have a suitable alternative for a Rolls-Royce system. In the absence of truly expert advice I don't feel the cost saving offsets the risk of damage to the brake pumps. The system will work just as efficiently with DOT 4 fluid but you may find after a while the frequency with which you have to top up the reservoir increases.

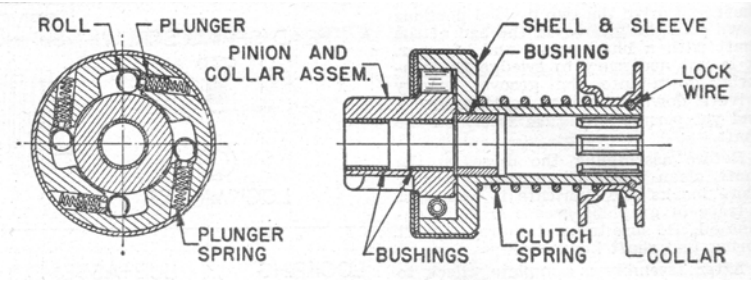
I live in Malaysia, which probably has very similar humidity levels to Florida, and even with DOT 4 change fluid at least once a year.

FOR STARTERS

The blue car gradually became harder and harder to start keeping the battery at optimum level (by connecting a trickle charge when the car was not in daily use) helped for a while, however, the time came when even that could not stave of the inevitable. I had to remove the starter and have it overhauled or replaced. Discussion with fellow SSII owner and Tee One member John Begg and several others led to a price check on the Nippon Denso replacement starter which was earning a fine reputation for itself as an after-market improvement on the twenty year old Lucas originals. I received a four-figure shock and decided to overhaul the one I had. Having a trusted auto electrician is a wonderful asset. Steve from the Battery Terminal here in Jamieson (ACT) took the greasy tired starter and transformed it into a near new item. He skimmed the commutator, replaced the brushes, the solenoid and refurbished the housing after checking that the windings and the insulation were in order. But I get ahead of myself. The following is a description of what I chose to do. Take from it what you will, but always remember to consult the workshop manual first and observe all safety precautions,

Tools

1 Workshop manual
2. Ramps or jacks and stands (or a hoist if lucky enough, right, John E),
3. A/F socket set (including extension bars)
4. Short ½ in A/F and 9/16 in A/F spanners
5. Knockometer (to persuade exhaust system to disassemble)



From the Silver Cloud II series on, multiple disc clutches were dipensed with in favour of the over running clutch above. These can be overhauled by a specialist firm in Melbourne. They should be tested for slipping at 25 – 30 ft lbs with a tension wrench

My way

- Raise the vehicle to working height, chocked the rear wheels and removed the right hand front wheel.

- Disconnect the battery,

- Remove the right hand exhaust down pipe from the engine manifold by undoing the two clamp bolts on the retaining collar and the U bolt clamp connecting the pipe to the muffler. The hammer (knockometer) came in handy as the pipe was almost welded to the muffler inlet.

- Undo the two nuts holding the starter motor heat shield in place, I wiggled it until it came off.

- That exposed the solenoid electrical connections and I disconnected them after marking them (my memory ain't what it used to be).

- The earthing lead connections were next to be removed using a 1/2 in open ended spanner.

- From the base of the starter, I remove the two retaining bolts inserted from the front of the car using a 9/16 A/F socket. The extension was needed.

- Remove the last retaining bolt of the starter by reaching, behind the bell housing as the bolt is inserted from the rear of the assembly.

- A bit of manipulation was needed as the rather heavy starter motor was a close fit in a confined space.

Once out, I took the easy option and handed the starter to my friendly auto electrician who did a no fuss overhaul on it and had it back to me in 24 hours, refurbished and freshly painted. Installation was simply the reverse of the removal sequence.

A function test revealed that when in good order the Lucas starter works very well and I have no cause to worry about it for another twenty years or so. 0h yes, the overall (and overhaul) cost was less than 20% of that after-market replacement I had been considering.

At the risk of boring you please remember that this is merely a description of how I did the job and I refer you to the disclaimer at the head of this bulletin. Anyone wanting to discuss this procedure is welcome to call me on (02) 62553360. Keep your car alive, drive it regularly!

George Shores

SEE THE LIGHT!

A well established South Australian firm *Classic and Vintage Bulbs* provides an excellent service to owners of any car in the supply of specialised bulbs, sealed units and for many semi sealed units, refurbishment and new lenses. They have obtained sealed halogen bulb units and adapted them to the base required for the individual car requirement. They also provide halogen bulbs for tail lights although one should be wary of using these with plastic lenses given the heat generated.

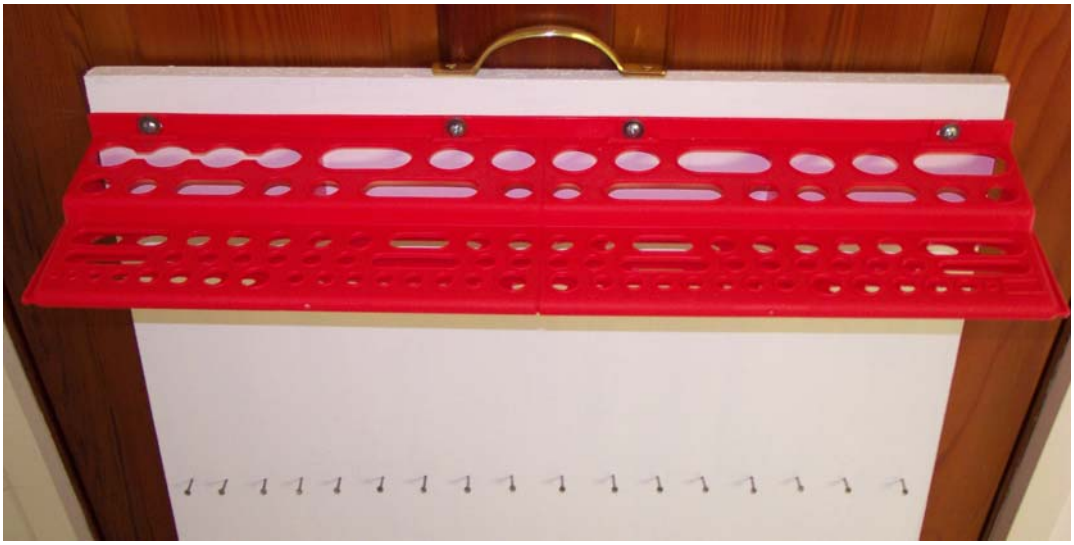
Classic and Vintage Bulbs 82 Cumming Street BLACKWOOD 5051
Email; cvb@pobox.com.au
http://welcome.to/cvb
Phone and FAX 08 8278 4393

The Wardo Stacker
Or
Experiencing an Afflatus

Wayne Wardman felt that the originality of Bill Fleming in adapting the lid of a $17 coffee pot as a parking cap was too much of a challenge to go unheeded. His contribution follows.

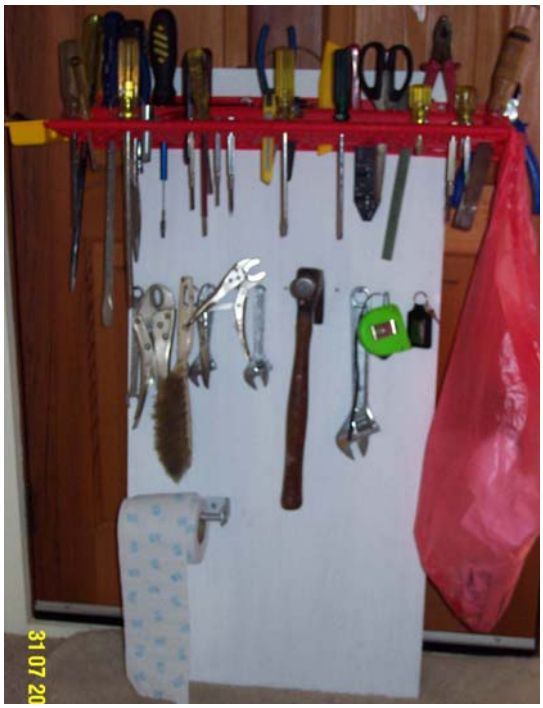
Anyone who has visited my place knows that my garage is always in an extremely tidy state… NOT! Well after hearing enough derogatory remarks from Prominent Persons within Tee One I decided that there must be a solution.

I had an afflatus. What if I had somewhere to place my 'active tools' away from their main storage area and near the car but still in a mobile situation. The gray matter ticked over and the Wardo Stacker (patent pending) is the result.



This photo shows the essentials. A piece of 18 millimeter chip board with a tool rack near (but not at) the top, a row of nails below this and a handle on top.

This photo sees her suitably clad with current toolage.



I added a loo paper holder as I use this material to wipe grease off objects. The plastic bag acts as a local garbage collector.

George Shores is busy testing one model that may be seen at Tee One meetings.

If you like it, make one. Cost is modest and utility large. Hard to beat that!

Wayne Wardman
ACT

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