

# TEE ONE TOPICS

Issue 51 March, 2006

---

---

## MY EXCUSE

Before you go sending me emails asking where February's issue is – there wasn't one. Since these notes are read by many more people than just members of the Rolls-Royce Owners' Club of Australia, many of you wouldn't be aware that I also write for our National magazine Praeclarvm which I unashamedly claim as the best publication for the Marque in the World. A fair claim I know but our Editor somehow finds a happy blend between a 17 page detailed description of lapping in the tang of the glove box lock and those revolting accounts of our cars liberally flavoured with hyperbole including gliding, serene, gracious, dignified, silent and stately to quote but a few. The quality of the printing and layout is very professional and it would be the rare reader who would not read an edition from cover to cover.

Well all this started out to say that where I live we only have 24 hour days and among other little duties I had recently was to ensure as best I could that our reigning Monarch could be conveyed in comfort with a reasonable guarantee of timely arrival! But I will endeavour to make good the shortfall in future editions.



## IS YOUR ROLLS BECOMING UNRAVELLED?



I must confess to a little pessimism about future parts supply for our cars. Most of us were greatly reassured when the new company announced that they would maintain our spares stocks but realistically we all know we have been greatly spoilt for many years, being able to obtain so many bits to keep our cars on the road. This of course has come at a cost but if you consider the expense of warehousing, accounting and preserving parts which may never be sold, you may be a little more understanding. This situation

has been thrust onto our new benefactors and quite reasonably they need to get a reasonable return on their investment. There is little or nothing that can be done by the owner to protect his interests but an awareness of the practicality of spares supply should help.

So here we have probably a quality control problem in a rather important area. The main brake hoses for SZ cars have traditionally been protected by a plastic coil 'spring' loosely threaded around the main body. Recent stocks however appear to come with a much lighter 'gauge' spring and after but a few kilometers they unravel! This is not predicting immediate brake failure but the covering was put there for a purpose and I like to think it will stay there. What you do about it is up to you. For mine I pull the spring off the old hose and thread it on the new!!!



### **FOR THOSE OF US WHO CAN'T DO THEIR SUMS**

Shortly after buying my Spur which was fitted with an imperial speedometer I was cruising along the newly upgraded Barton Highway out of Canberra. Coming onto a crest I was confronted by a member of the constabulary pointing something at me. It took several nano seconds for my aging brain to realise that it was indeed a policeman, secondly that it was not a gun he was pointing at me and that it was a radar speed reader. Instinctively I looked at the speedo, recalled that I was supposed to be doing a 110 kph, established that I was actually doing just that but not before I had to peer at the little coloured numerals around the inner dial and then I expect I looked up.

Now as I was travelling at more than 88 feet per second while I was peering at my speedo you will realise that when I refocussed on the road ahead I was very much closer to my radar gun toting officer! In fact my next assessment was that I was going to run the hapless fellow down because just over the crest, I then realised, the road was veering slightly to the left and the car's course was set for straight ahead. Fortunately the officer's assessment of my car's intentions were the same and while I was taking the car out the gravel on the side of the road, this same officer did a sideways leap that would have been the envy of the greatest ballet dancer that ever lived Vaslav

Nijinski! Unfortunately the leap ended in a bush which became entangled with the officer and radar gun. I might have pulled up but thought a little prudence wouldn't go astray, but my conscience got the better of me so I went into the Yass Police Station and confessed to what had happened. To my astonishment they thought the whole episode was hilarious as apparently my 'man' was known to be a little over zealous and I gathered the account confirmed the idea that it couldn't happen to a more appropriate person. I left my name and an apology.

So the picture? Well one of our local members with a very nice S2 Bentley apparently suffers the same confusion as I did and whereas I quickly found a metric instrument and installed it shortly after the above excitement, the availability of metric speedometers for S series cars is on a par with dentition for domestic fowls, so our clever member had a piece of Perspex etched with appropriate kilometers and solved his problem.



### **ON HUB CAPS**

This is a very unkind picture of a hub cap on a fairly well known car that if we are to believe the media was viewed by no less than 1,500,000,000 people recently on TV. The car's chrome and paint work are very good, even spectacular, but the hub caps as you will see have suffered over the last 30 odd years at the hands of automotive terrorists inflicting various nicks dents and bends. Worse still the entire surface appeared to have been polished with steel wool. And while I am at it the coachline was too thick and not central.

In Canberra we have probably one of the most used, best fed Cloud III's in captivity and that up till a couple of years ago, had hub caps (or wheel covers as I have been so often told) in even worse

condition. These were stripped and sent to the local plating firm and buffed. Quite a large job and not cheap as it is pure labour! So when I viewed the black car's caps I announced a complete refurbish of these small items.



Well before you rush out and start stripping the caps be aware that the Silver Cloud and S Bentley had chrome plated steel caps which can only be improved by replating! The later series 2 and 3 cars were fitted with stainless steel caps. If you are in any doubt get yourself a magnet. If it sticks to the cap it is NOT stainless steel. The 'paint rings' are held on to the cap by spire nuts which simply push over spikes welded to the rings. These need to be carefully prised off which will

release the ring. With my task the rings for some inexplicable reason had been glued to the cap as well as having spire nuts installed. In fear I left it to the polisher to remove these which he did with a heat gun without damage.

Meanwhile I collected four paint rings and had them painted in the regulation Mason's Black – a perfect job by our local painter. They were then sent to the coach lining people in Sydney to have their ring applied and to be coated with 'clear' as the paint people call it. Well it all came together in time and the finished job was perfect.



## ON TYRES

There is a young man in the States, Christopher Longhurst who has gone to a lot of trouble writing an Automotive Bible! One section deals in considerable detail with tyres which I have pinched for your information. Recently we went through a possible crisis over the supply of tyres for our post '55 cars and fortunately Mr Cooper has come to our rescue with his 235x70 Craftsmen units.

One aspect of tyre use that people have little regard to is age. There are various opinions but it seems a tyre's life has expired after 5 years **whether you have used it or not!** A couple of years back I forced a very nice 1985 Spirit up the mountains from the coast with the object of clearing the chimneys. The next day I saw the car from underneath and clasping my trembling lips noted that on all tyres the inner steel belt was actually falling out of the carcass of the tyres. What was more astounding the date of manufacture of the units **pre-dated the manufacture of the car by 2 years!** The tyres were original and had only done some 55,000K!

So the excerpts that follow should be of interest starting with an idiot's guide to the markings on the tyre wall.

Key	Description
A	Manufacturers or brand name, and commercial name or identity.
B and J	Tyre size, construction and speed rating designations. <i>Tubeless</i> designates a tyre which requires no inner tube.
C	Denotes type of tyre construction.
D	M&S denotes a tyre designed for mud and snow. <i>Reinforced</i> marking only where applicable.
E	Load and pressure marking requirement (not applicable in the UK). These go from a <a href="#">load index</a> of 50 (190kg) up to an index of 169 (5800kg).
F	ECE (not EEC) type approval mark and number.
G	North American Dept of Transport compliance symbols and identification numbers.
H	Country of manufacture.

Also on the sidewall, you might find the following info embossed in the rubber.

The temperature rating - an indicator of how well the tire withstands heat buildup. "A" is the highest rating; "C" is the lowest.

The traction rating - an indicator of how well the tire is capable of stopping on wet pavement. "A" is the highest rating; "C" is the lowest.

The tread-wear rating - a comparative rating for the useful life of the tire's tread. A tire with a tread-wear rating of 200, for example, could be expected to last twice as long as one with a rating of 100. Tread-wear grades typically range between 60 and 600 in 20-point increments. It is important to consider that this is a relative indicator, and the actual life of a tire's tread will be affected by quality of road surfaces, type of driving, correct tire inflation, proper wheel alignment and other variable factors. In other words, don't think that a tread-wear rating of 100 means a 30,000 mile tyre.

Encoded in the US DOT information (G on the diagram above) is a two-letter code that identifies where the tyre was manufactured in detail. In other words, what factory and in some cases, what city it was manufactured in. It's the first two letters after the 'DOT' - in this case "FA" denoting Yokohama.

This two-letter identifier is worth knowing in case you see a tyre recall on the evening news where they tell you a certain factory is recalling tyres. Armed with the two-letter identifier list, you can figure out if you are affected. It's a nauseatingly long list, and I've not put it on this page.

### **DOT Codes and the 6-year shelf life**

As part of the DOT code (G above), there is a tyre manufacture date stamped on the sidewall. Take a look at yours - there will be a three- or four-digit code. This code denotes when the tyre was manufactured, and as a rule-of-thumb, you should never use tyres more than 6 years old. The rubber in tyres degrades over time, irrespective of whether the tyre is being used or not. When you get a tyre change, if you can, see if the tyre place will allow you to inspect the new tyres first. It's not uncommon for these shops to have stuff in stock which is more than 6 years old. The tyre might look brand new, but it will delaminate or have some other failure within weeks of being put on a vehicle.

Reading the code. The code is pretty simple. The three-digit code was for tyres manufactured before 2000. So for example **1 7 8** means it was manufactured in the **17**th week of **8**th year of the decade. There was no way of determining which decade, so in fact, 1 7 8 could mean the 17th week of 1988....Good tip : if the tyre has a 3-digit code, don't buy it!!

After 2000, the code was switched to a 4-digit code. Same rules apply, so for example **3 0 0 3** means the tyre was manufactured in the **30**th week of **2003**.

### **DOT Age Code Calculator**

The calculation built in to this page is up-to-date based on today's date. If the DOT age code on your tyres is older than this code, change your tyres.

**DOT AGE CODE: 11 00**

Interesting note : in June 2005, Ford and GM admitted that tyres older than 6 years posed a hazard and from their 2006 model year onwards, started printing warnings to this effect in their drivers handbooks for all their vehicles.

### **A Word on "guaranteed" tyres**

When I moved to America, I noticed a lot of tyre shops offering tyres with x,000 mile guarantees. It's not unusual to see 60,000 mile guarantees on tyres. It amazed me that anyone would be foolish enough to put a guarantee on a consumable product given that the life of the tyre is entirely dependent on the suspension geometry of the car it is being used on, the style of driving, the types of road, and the weather. Yet many manufacturers and dealers offer an unconditional\* guarantee. There's the catch though. The '\*' after the word "unconditional" takes you elsewhere on their information flyer, to the conditions attached to the unconditional guarantee. If you want to claim on that guarantee, typically you'll have to prove the tyres were inflated to the correct pressure all the time, prove they were rotated every 3000 miles, prove the suspension geometry of your car has always been 100%, prove you never drove over 80mph, prove you never left them parked in the baking hot sun or freezing cold ice, and prove you never drove on the freeways. Wording in the guarantee will be similar to:

*"used in normal service on the vehicle on which they were originally fitted and in accordance with the maintenance recommendations and safety warnings contained in the attached owner's manual"*

and

*"The tyres have been rotated and inspected by a participating (tyre brand) tyre retailer every 7,500 miles, and the attached Mounting and Rotation Service Record has been fully completed and signed"*

There will typically also be a long list of what isn't covered. For example:

*Road hazard injury (e.g., a cut, snag, bruise, impact damage, or puncture), incorrect mounting of the tire, tire/wheel imbalance, or improper repair, misapplication, improper maintenance, racing, underinflation, overinflation or other abuse, uneven or rapid wear which is caused by mechanical irregularity in the vehicle such as wheel misalignment, accident, fire, chemical corrosion, tire alteration, or vandalism, ozone or exposure to weather.*

Given that you really can't prove any of this, the guarantee is, therefore, worthless because it is left wide open to interpretation by the dealer and/or manufacturer. For a good example, check out the Michelin warranty or guarantee, available on their website (PDF file).

Don't be taken in by this - it's a sales ploy and nothing more. Nobody - not even the manufacturers - can guarantee that their tyre won't de-laminate or catch a puncture the moment you leave the tyre shop. Buy your tyres based on reviews, recommendations, previous experience and the recommendation of friends. Do not buy one simply because of the guarantee.

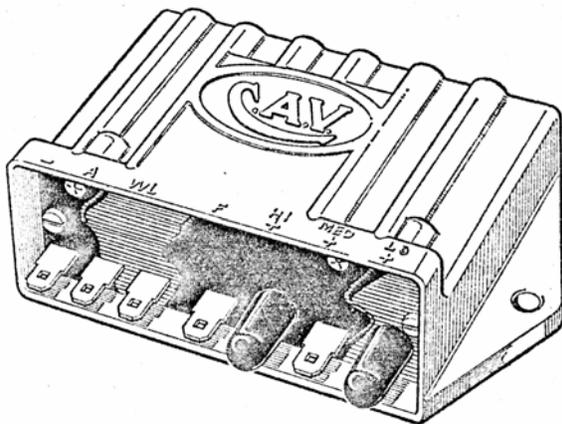


## **Shadow 1 C.A.V. Alternator and Control Unit**

*John Kilkenny shared the following with us. I just wish the Factory diagrams were as clear!*

The first alternator fitted to the Shadow was the Lucas 11 AC with a maximum output of 45 Amps, controlled by the Lucas 4 TR Control Unit.

Later cars used the C.A.V Model 5/12 Alternator with a maximum output of 55 Amps in conjunction with the C.A.V 440 Control Unit.



Charging rate adjustment is provided by connecting the battery positive terminal to one of three inputs on the Control Unit, depending on whether the expected load is low (L), medium (M) or high (H).

At left is the CAV Type 440 control unit. Most owners of early cars will be familiar with the shape and being silver in colour presumably to dissipate heat, it was quite conspicuous on the bulkhead for RHD cars in front of the driver's right hand knee! But owners of later cars can get frantic when their electrical fixit man asks where is the Control Unit? Well that is just to test your perseverance but to save your temper try looking behind the boot lining on the left hand side and voila!!

The additional resistors provided by the M and H inputs will reduce the control voltage on the base of the first transistor, which in turn will increase the field current and alternator output voltage. Unlike the Lucas system, the C.A.V. warning light is dependent on the operation of the control unit.

If the warning light does not come on when the ignition is switched on, this generally indicates a faulty control unit.

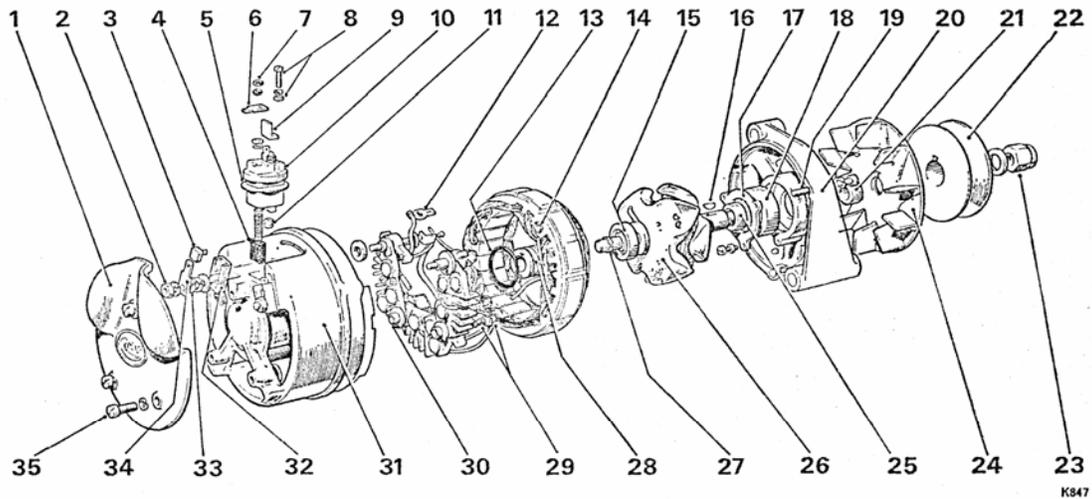
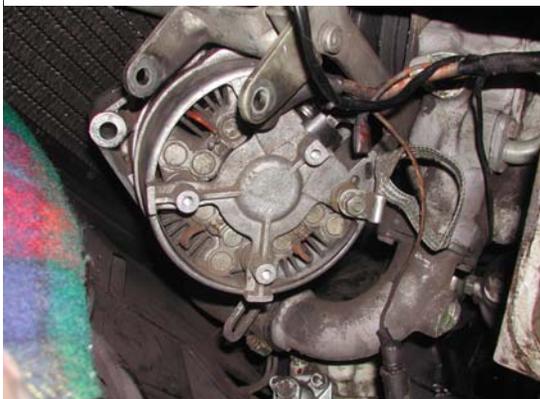


FIG. M93 EXPLODED VIEW C.A.V. TYPE 512 ALTERNATOR

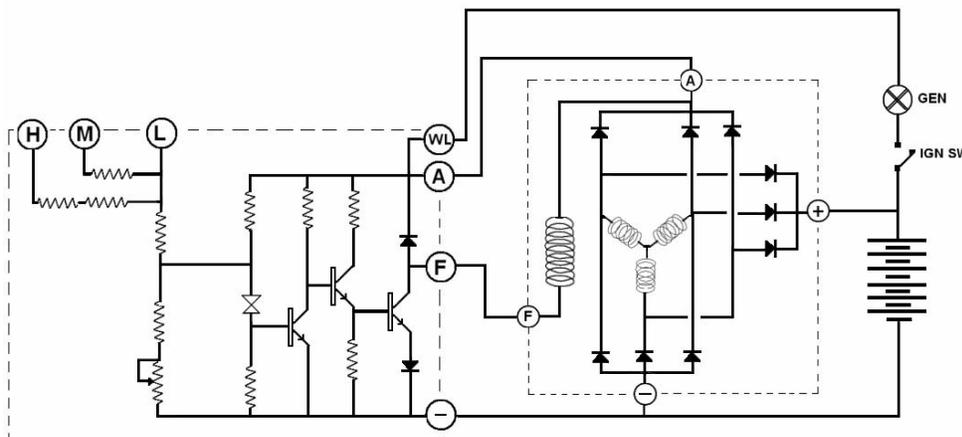
- |                                   |                     |                                  |
|-----------------------------------|---------------------|----------------------------------|
| 1 Baffle                          | 12 'A' lead         | 24 Fan                           |
| 2 Main terminal nut               | 13 'O' ring         | 25 Bearing spacer                |
| 3 Insert                          | 14 Stator           | 26 Rotor                         |
| 4 Brush                           | 15 Bearing          | 27 Circlip                       |
| 5 Gasket                          | 16 Woodruff key     | 28 Slip rings                    |
| 6 'Lucar' blade                   | 17 Clamp plate      | 29 Heat sink securing screw      |
| 7 Field terminal nuts and washers | 18 Bearing          | 30 Diode and heat sink assembly  |
| 8 Retaining screw and washers     | 19 'Through' bolt   | 30 Slip ring end shield assembly |
| 9 Insulator                       | 20 Drive-end shield | 32 Shroud                        |
| 10 Brush holder                   | 21 Fan spacer       | 33 Round slotted nut             |
| 11 Grommet                        | 22 Pulley           | 34 'Lucar' terminal              |
|                                   | 23 Pulley nut       | 35 Baffle screw                  |



When removing the alternator take plenty of pictures of where the various wires go and label each wire as you remove it with labels that will not fall off. This is an installation on a Phantom with the end plate (1 above) removed to gain access to the various terminals. Note that the terminals on the brush holder (10 above) are push on. They tend to loosen with age (don't we all) and can slip off very easily.

Otherwise it is plain sailing. Every few years it is not a bad idea to whip the unit off and drop it into your friendly local sparky who will check the brush the slip rings and bearings as well as clean up the wiring which tends to dishevel itself!

Also keep an ear tuned for extra noise which is usually bearings. Once again these gadgets are not meant to run forever without a bit of TLC.



## STARTING A FUEL INJECTED ENGINE

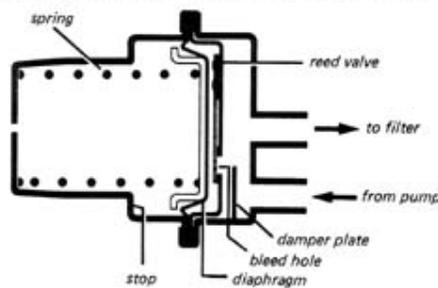
*“My Silver Spirit, fuel injected, starts very well when it is cold, but after driving the car for maybe 10 minutes or even maybe one hour and stopping, the engine does not fire after trying to start up five minutes later? Leave it for an hour or two hours, then she starts very easily.”*

This is a very common complaint with fuel injected cars about which I know very little. But I had one owner with a nice injected Spirit who, not used to the model commented that they seem difficult to start when hot. She had put up with the problem for so long that eventually the starter gave out! Before that however my local tuning man gave me a quick lesson in what was involved.

My explanation to the above site question was:-

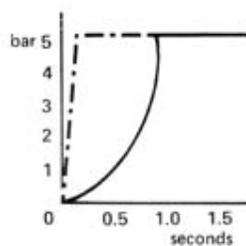
**ACCUMULATOR**

The accumulator is located between the fuel pump and filter. It improves hot starting by helping maintain residual fuel pressure when the engine is turned off. It also reduces fuel pump noise by its damping action and protects the metal diaphragms in the fuel distributor from rapid pressure build-up when the pump begins running.



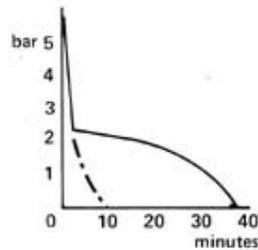
### SYSTEM PRESSURE BUILD-UP

When the fuel pump begins running, the fuel chamber inside the accumulator is filled through the one-way reed valve, and the diaphragm is forced to the left against the spring until it reaches the stop. Only after the diaphragm reaches the stop does system pressure reach its operating limit.



### SYSTEM PRESSURE DROP

After the engine is turned off, the spring slowly pushes the diaphragm to the right, forcing about 20 ccs of fuel through a small hole in the reed valve to help maintain residual fuel pressure and avoid fuel vaporization.



with accumulator ———  
without accumulator - - - - -

Fools rush in as the saying goes but here I am - fuel injection is something I am creeping up on. The problem is almost certainly your fuel accumulator. Most owners do not realise that the fuel for these systems needs a pressure of about 65 psi to function - far greater than the 1-2 psi put out by the old SU pumps and dribbled into the carburetters through the cistern like float chambers. When you start your fuel injected car cold it uses a different system to get the fuel in. Once the system is running the fuel pumps build up pressure, which apart from supplying the injectors fills up a thing adjacent to the pump called an accumulator. This is a spring loaded device. As the fuel is forced into it, it compresses the spring. When the engine is turned off the fuel is retained in the accumulator for some time so that on re-starting the engine it immediately has fuel at the required pressure.

Your accumulator is I suspect kaput. It is often possible to start hot but you are very likely to destroy the starter motor in the process.

To this I plunged in further and added this diagram on our Club site:-

I was attempting to explain the function of the fuel accumulator required for fuel injected engines. A hot engine requires considerable pressure of fuel to start, this is supplied by the accumulator. A cold engine uses a quite different system. The symptom is usually very hard if

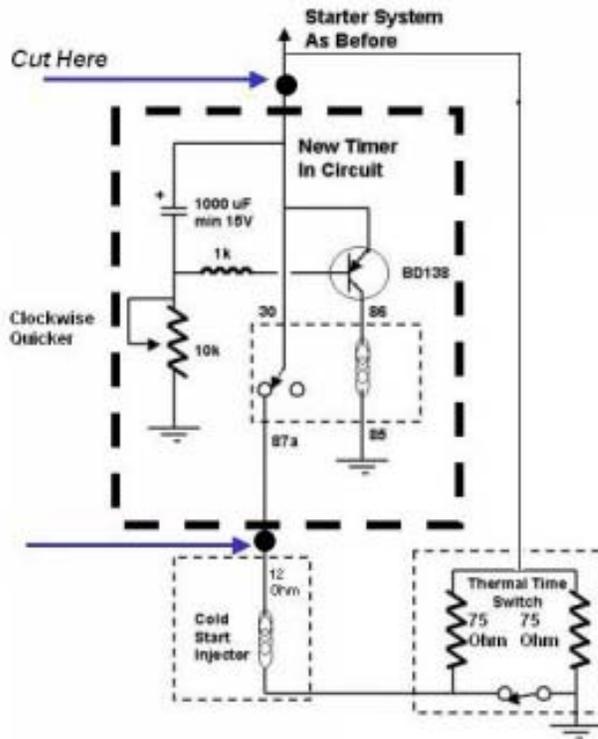
not impossible hot starting but when the engine cools down it will start immediately. The accumulator I believe is a sealed unit and not repairable. It is located beside the fuel pump on

the left hand side of the car above the rear axle. After-market units are perfectly satisfactory and are usually supplied by auto tuning shops that service fuel injection systems!

Richard Treacy our expat font of knowledge on these matters added the following:-

Further to Bill's comments on fuel accumulators, many owners have had starting difficulties with fuel injected SZ cars over the years. If yours is so, the following may be useful.

### Cold Start Timer Relay

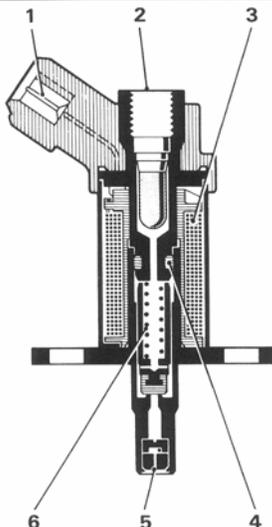


Cold starting is helped by a cold start injector, controlled by the thermal/time switch. This little devil switches out the injector after 8 seconds' cranking or whenever the motor coolant is at over 35C. The thermal/time switch is very easily replaced, being located on the thermostat housing. It is also easily tested in-situ.

If your car is more difficult to start than it should be when hot but the accumulator is fine, simply pull off the plug on the cold start injector and see if it is temporarily cured. If so, then the thermal/time switch has probably failed.

Now that winter is passing, and after trying an improvement under all imaginable conditions since last July, I feel ready to share that improvement with other potentially frustrated owners. My motor (KE2 Jetronic) started instantly under all conditions (-25C included) except when cold on warm days over about 18C. On those warm days, it took a few seconds, sometimes as long as 5 painful seconds, as the thermal/time switch stays on for up to 8 seconds. Starting was followed by a puff of black smoke, proving mild flooding. Clearly the cold start injector tends to flood these motors in warm weather when the motor is not warmed up

for the thermal/time switch to inhibit it. Experience has proven that the 8 second time-out on the standard Bosch switch is far too long for these large motors.



At left – the cold start injector which is basically a tap inserted straight into the intake manifold which squirts enough fuel into a chilly engine to get the thing moving. It only works while the ignition key is at the start position and the thermal time switch is closed.

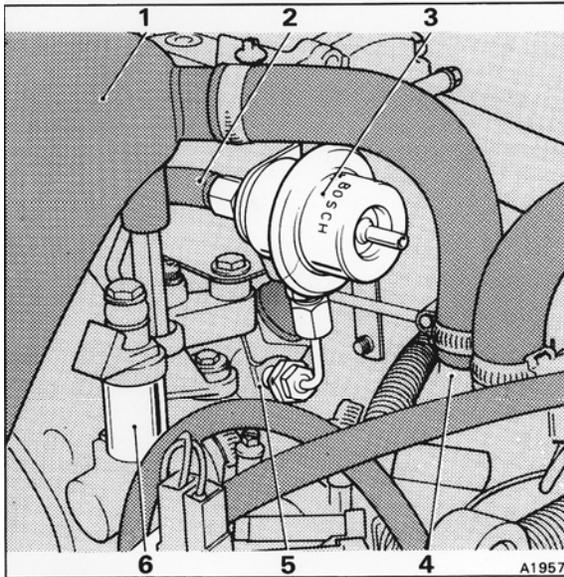
- 1 Electrical connection
- 2 Fuel inlet
- 3 Magnetic coil
- 4 Sealing ring
- 5 Swirl nozzle
- 6 Armature

As a permanent improvement, I have designed and fitted a very simple timer relay in the circuit using the standard Bosch relay type used throughout these cars. It is adjustable. I set mine to 1 ½ seconds, so the cold start injector switches out regardless of

the thermal/time switch status after that interval. The longest it ever takes to start is 2 seconds now, and only in that worst case: warm day, cold motor. One great advantage is also that, should starting be difficult in cold weather, you simply try again. With the timer, the thermal/time switch will not time out: every time you turn the key when cold, you will have a squirt of fuel for 1 ½ seconds. Functionally this makes far more sense than the basic arrangement. In the basic arrangement, a failure to start due to inadequate fuel requires a wait of 5 minutes for the

thermal/time switch to reset. In fact, the thermal/time switch is basically redundant now, but nice to

have to guarantee instant hot starts.



**Fig. B2-12 Fuel pressure control valve and damper**

- 1 Air intake elbow
- 2 Fuel feed from distributor
- 3 Pressure damper
- 4 Crankcase breather housing
- 5 Pressure control valve
- 6 Cold start injector

The wiring diagram is shown on the previous page. The relay is mounted on its socket (I mounted the timer components under the socket and encapsulated the socket base to form a timer module with a plug-in removable relay), and is mounted neatly next to the headlamp sequencing relay by the LH suspension tower.

And by now you will be wondering where the Hell this cold squirter is. I gave up trying to photograph it and used the Factory drawing at left.

The two wires to the injector share an original loom, so it does not look in any way tacked on. I cut the +ve lead to the injector, and fitted a standard spade plug to one end and a spade socket to the other. In the unlikely event that the timer were to fail, you would simply unplug it and reconnect the injector direct via the new plug and socket.

I realise that the above is very detailed and specialised but reading it should give you a rough idea of one part of this very complex system. As to Richard's modification, if you think it may be the answer to a problem you have, take this article along to your friendly tuner and get his opinion.



## ARE YOUR JOINTS STIFFENING UP?

You do remember the old item on your car repair bill 'Grease and oil change' The Factory endeavoured to overcome this with the one shot system which with a lot of mothering did a splendid job, kept your anxiety level slightly elevated wondering whether it was working and ruined countless driveways and garage floors. Eventually with the new fangled Cloud the Factory finally allowed grease nipples to be fitted. Not all at once mind you but progressively they replaced the little drip plugs – what an appropriate name! Even then

they had to use flat faced nipples – none of your vulgar types used on lesser cars! But if you have

to replace one be aware that they are readily available from machinery shops lest you inadvertently buy a genuine one and have a seizure at the price charged. The 'after-market' ones are so slightly different you have to put them side by side to spot it!

I have yet to have explained to me that these nipples are preferable to the common type. They are apparently used on heavy machinery if that is any clue. Even so I get rather liverish when I see service stations have ripped the right nipples out and put in the conventional ones simply because they are too bloody lazy to get a grease gun adapter!!



Enough! Well this continued until the Shadow launched rack and pinion steering, auto air conditioning and the 'Over 2000 improvements' that were allegedly incorporated into the Shadow II. So the item on the bill was shortened to 'oil change'.

Tie rod ends and ball joints were packed with long lasting grease and in theory when the grease dries up the joint is worn out. To keep the grease in and the road grime out elaborate rubber boots were moulded and the buyer of a Shadow II could forget nipples other than the universal joints but they are a small task.

Tie rod ends are now fully sealed and incorporated into the actual tie rods on the the SZ cars, Shadow II's still have that very nice undo, clean out and adjust, item. But both cars have upper and lower ball joints on which the whole car sits and allows you to turn the wheels for steering. They are a simple joint, a ball headed pin rides on a composition pad which

in turn sits in a shaped steel cup. When they are made the whole thing is screwed together with a lot of grease and hopefully you are right for another 100K miles!

So after all that preamble now look at the picture. Not only has the ball worn through the composition pad but look at the ball in detail in the lower picture. This is a case of simple corrosion brought about by failure of the rubber boot to keep water out. Go back to the first picture and note the cup that the lower ball joint screws into. See the smooth elliptical shape ground into it which was from the ball going through the compound cushion and grinding its way through the cup. More expense which could be avoided by a little preventative maintenance!

So what to do? First keep an eye on the boots around all of these joints, if they split bite the bullet and have them replaced. Checking for worn joints is another matter. Because of the tremendous force exerted by the coil spring, it takes a lot of leverage to move a ball joint laterally. Sometimes wear can be seen by lifting the car off its wheels and having someone turn the wheel against its stops with the engine running. The pin will usually be seen moving from side to side within its housing.

