



Service Lights

Getting those service lights working properly is easier than you think.

Ever since the system was launched in 1981 with the then new E28 5-Series, the BMW Service Indicator (SI) system has been controversial.

Follow the magic lights to the book and your BMW will last forever, that was the idea. Once the cars were a few years old however, these flashing lights became a pain and for a while there was no way around this, apart from BMW dealer servicing.

Then, in the mid '80s, tool companies like Sykes Pickavant marketed their own tools for putting the dreaded lights out and all was well. In the late '80s people started to notice that even with the reset tool the bloody lights wouldn't go out.

This was because the Nickel Cadmium rechargeable batteries that powered the reset system were dead. In those days, putting new batteries in was an option that some took but not all. Most owners just waited until the lights finally expired, giving peace at last.

But trouble was brewing behind the instrument panel as those dead NiCad batteries unleashed their cargo of acid through the corroded housings and all over the SI boards. The boards also control the gauges themselves as the power from the fuse box has to get around the SI board before it can reach the instruments.

So, when the gauges start acting up it's time to sort it out. This article isn't about fitting new batteries as by the time these are needed, the SI boards will be scrap. Putting it right with new boards doesn't cost a fortune, it's not hard and you don't need a special tool to reset the lights either.

YOU'LL NEED

Screwdrivers
Socket set
Steady hands
About an hour



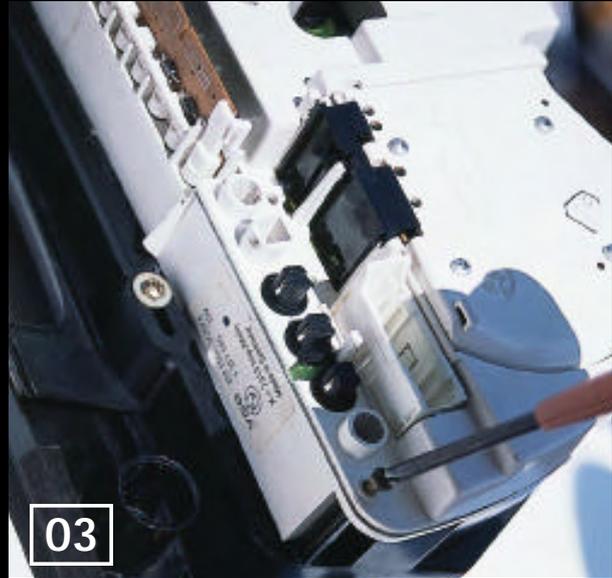
01 First job is getting the instrument pod out. We used a 1983 628CSi for this, which is one of the hardest to do. Remove the black plastic panel either side of the cluster, which comes out to reveal the lower two retaining screws.

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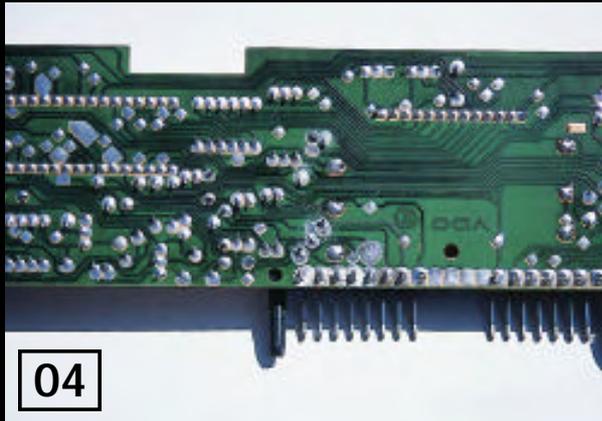
02

You'll then need to remove the lower dash cowl and the steering column bolts to drop the column for clearance. The E28 5-Series and E23 7-Series cars are much easier, just two or three screws at the top and it pops out. All BMWs have three multi-plugs, blue, yellow and either white or black. We outlined removing the 3-Series E30 dash in the July issue but it's very similar.



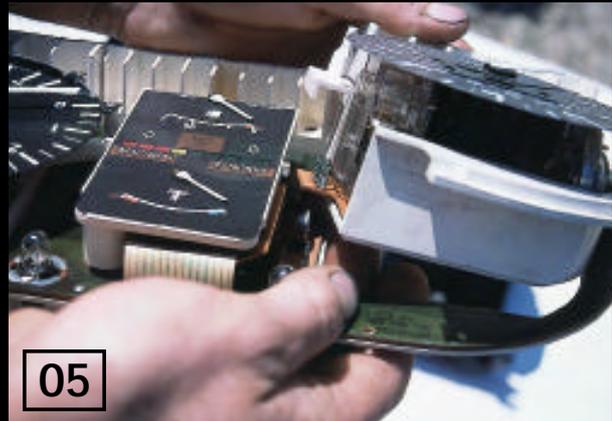
03

Once the pod is out, remove the anodised self-tapping screws and separate the cowl from the main unit.



04

You see just how bad things are when you look inside. If there's just a trace of green gunge on the circuit board you could use a toothbrush and some electrical contact cleaner. However, 99 per cent of the time the board has had it. Any discolouration around the edges mean acid absorption and a scrap board.



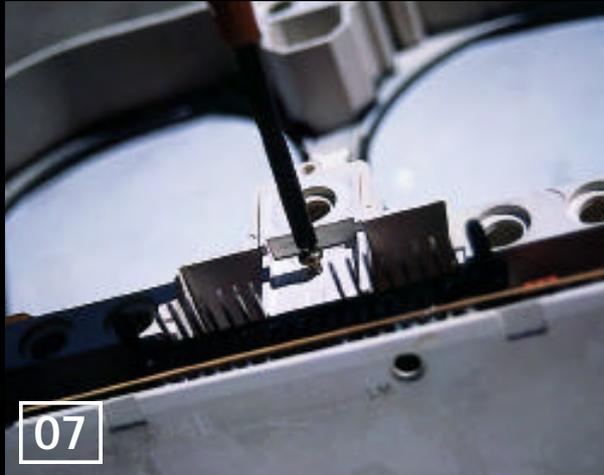
05

Now pull the instruments out carefully. Corrosion on the pins causes mayhem with the instruments and any speedo or tach faults can be a result of this. If you're not bothered about the SI lights, you could, in theory, take the batteries out and bin them, clean up the locating pins and have working instruments again. The speedo can often be the first thing to curl up its toes.



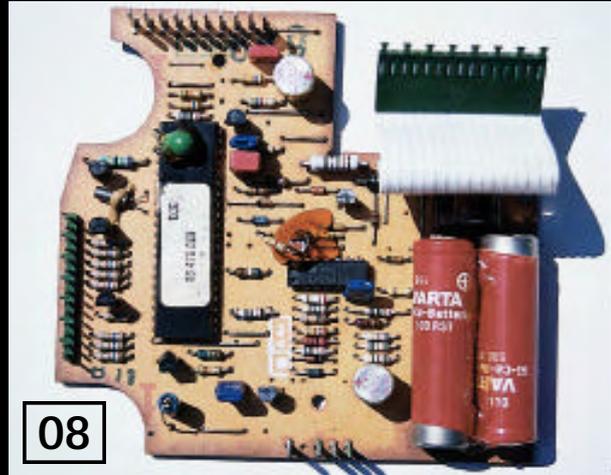
06

Now remove the board and fit the new one. From Hartlake (01634 294115) you're looking at £85 for a reconditioned board with new batteries and ready to go. Or you could get a good used board from FAB (01594 860325) for even less. What about fitting new NiCads bought at your local electrical retailer? Don't bother, as they won't work for more than a week or two at the most. It gets quite hot inside an instrument cluster on a warm day and regular NiCad batteries just can't hack it. Fit the new boards, reassemble the pod and refit it. No hassle.



07

Now for E30. Once you've taken it out, split the main pod away from the cowlings by removing the screws. On these pods you can leave the instruments in place as the SI board is mounted in the instrument cowlings and not the main instrument unit. Note that pods made after January 1986 are different from earlier ones and many had the later, improved Lithium batteries which you can't fit to older boards.



08

Remove the single screw and lift out the SI board retaining collar followed by the board itself. Corrosion along the bottom results in a dodgy temperature gauge and, like the other models, acid contamination means it's scrap. Again, it's dead simple to replace a scrap board with a reconditioned unit and at around £50, depending on model, it's cheaper than changing the SI board on the bigger cars.



09

Later cars like the E32 7-Series and E34 5-Series generally use lithium batteries and these don't leak. They don't last forever either, but at least you won't have the instrument cluster disasters when the SI lights go down. Removing the cluster and fitting a replacement SI board is very similar to the older cars but normally fitting a pair of new lithium batteries does the trick. One pointer though, very early 518i and 520i E34 cars still had the NiCad batteries, so watch out.



10

As we said earlier, you don't need a service indicator reset tool to bring all those lovely greens back on. Simply locate terminal seven on the diagnostic socket and run a wire from this to the battery earth for about 10 to 20 seconds. Be very, very careful to get terminal seven though as they are bunched up tightly and the wrong pin will result in a fat spark as you try to earth a 12V supply. The photo here shows the correct one and the car diagram on the socket does too, if it's still there that is.

How do they work?

The SI microprocessor on earlier BMW models received inputs from the starter, rev counter, odometer and an engine temperature sender. On the basis of these signals, it calculated the mileage when maintenance would be required. The SI light computer estimates miles travelled. So once it reckons you've gone a certain number of miles it illuminates one of the SI lights.

There is actually a formula for working this out, $e = a(1 + t + r)$, which only keen mathematicians will want to play with. If you want to do the sums though: e = estimated mileage, a = actual mileage travelled, $t = 1$ if engine temperature is below operating temperature, otherwise $t = 0$. If engine is above 4500 rpm then $r = 0.5$, if below $r = 0$. Once the computer reaches a particular count value — roughly 7500 miles for the oil service and 15,000 miles for inspection — it will illuminate one of the service lights.

Since 1997, the microprocessor's programming has been simplified and it now considers only the vehicle's fuel consumption. BMW engineers have found that this is

an adequate predictor of service needs as higher fuel consumption would suggest harder use.

In a BMW, the Digital Motor Electronics (DME) system meters fuel to the engine in precise response to how and where your car is being driven. The DME can even tell when the engine is being subjected to high stress conditions, such as pulling a heavy trailer up a steep hill. It governs all engine controls, including ignition timing and fuel injection, to ensure optimum efficiency at all times. It also controls every opening of the fuel injectors — which can last for only a few milliseconds — to meter the exact amount of fuel required at any point in time.

Monitoring fuel consumption like this gives a very precise suggestion of the stresses and strains that the engine is experiencing, so the Service Indicator is actually using a very accurate assessment of the driving conditions and consequently makes an equally spot-on service recommendation.