The Auto Powerfolds Project.

This modification was designed for cars where all the doors unlock at a single press of the key-fob unlock button.

It WILL work if you have "double-click" unlocking enabled but may produce unwanted movement of the powerfold mirrors.

In addition, Speed Locking should be disabled until I can work out a way of getting round it.

These functions can be disabled / enabled with T4

What will it do?:

This project enables the powerfold mirrors to sense the lock and unlock pulses in the car.

The upshot of which is that the powerfolds extend when you unlock the car and retract when you lock the car.
Major plus point is that you DON'T need to be feeding wires through the door jamb. The whole project is done within the driver's door wiring.

Please be aware that this module is extremely simple. Consisting, in essence, of a few diodes and a relay. There is no reason why you can't put it together with discrete components. The module is just a way of doing the job conveniently and in as small a footprint as possible. It also saves grief if you can't tell your anode from your cathode ;)

This is what the module looks like:-

This project does NOT affect the normal operation of the powerfold mirrors.

The caveats:

The mod to the OEM window / mirror switchpack requires a degree of dexterity in the use of a soldering iron of the miniature, electronic assembly type. It is not a job for the 50watt Weller leviathan ;)

In common with any electrical installation work, you SHOULD disconnect the battery prior to starting. If you DON'T and you pop fuses, that's YOUR problem ;)

The basic procedure:

Modification of the OEM window / mirror switchpack.

Installation of the module and connection into the door's wiring.

Testing.

I'll go through each stage in as much detail as possible in the following pages. Please do not feel insulted if I assume little or no prior knowledge. I hope this "how-to" will be of use to anybody who wants to install the mod and I know some people are a little wary of anything to do with "electrickery" :)

Preliminary:

I acknowledge the appropriate sources for those pictures and diagrams used in this How-To which are not mine.

Not a great deal of preliminary work for this one:-

1. Consider where to locate the module. It measures 45mm x 35mm x 15mm. If you decide to enclose it in a plastic box and can seal the outlet grommet with a little silicone sealant, the housed module can be located anywhere within the door providing it doesn't foul any moving parts

As an alternative, the module can be located in the switchpack housing in the trim panel and doesn't need a housing unless you want to. You'll need to extend the wiring though, to ensure that the trim panel can be removed subsequently if required.

The decision is yours :)

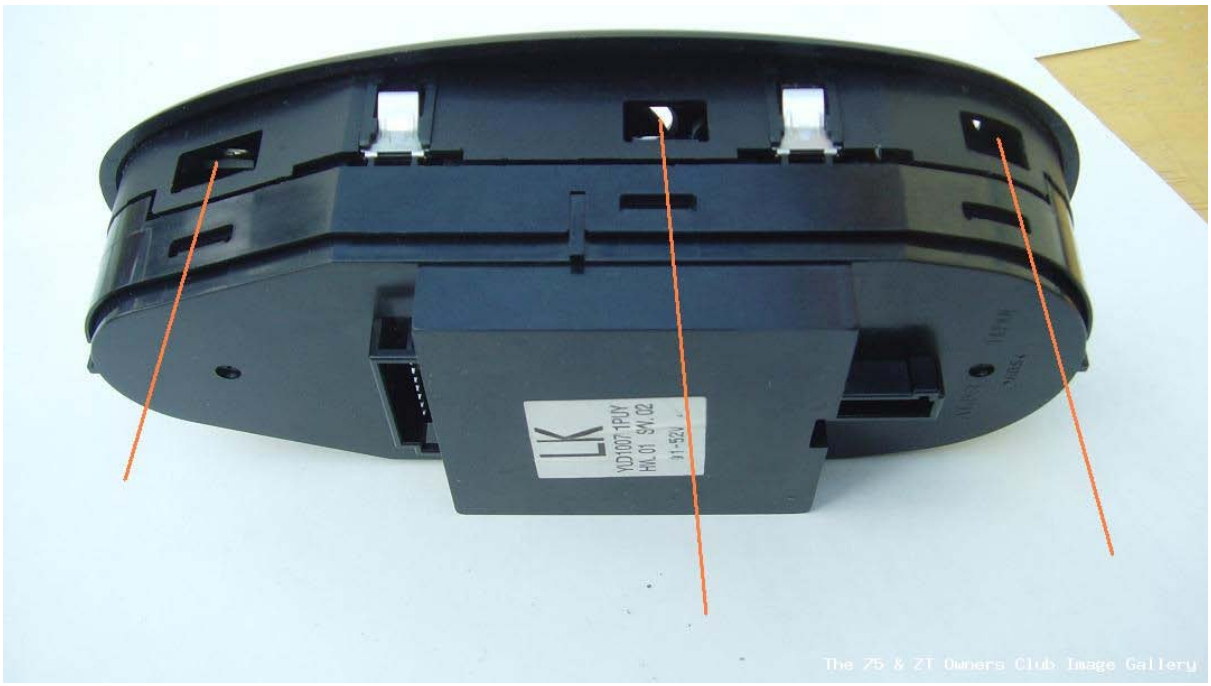
2. Remove and set aside the driver's door trim panel.

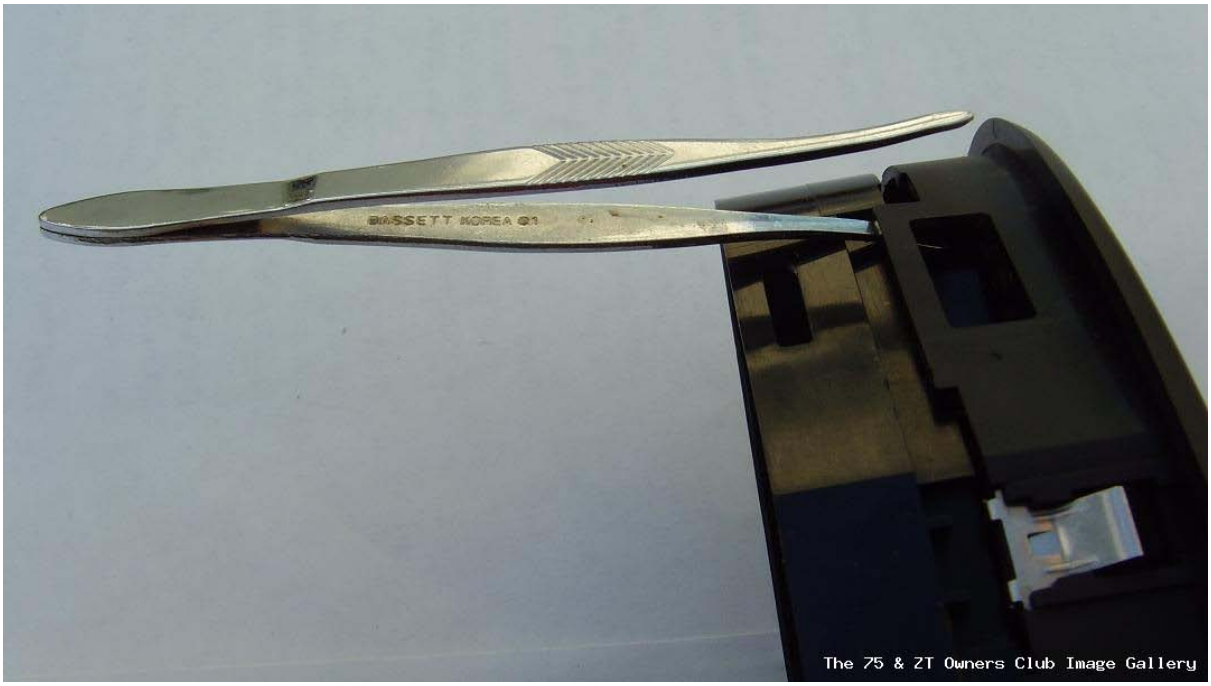
That's it. The preliminary work is now done.

Modification of the OEM window / mirror switchpack.

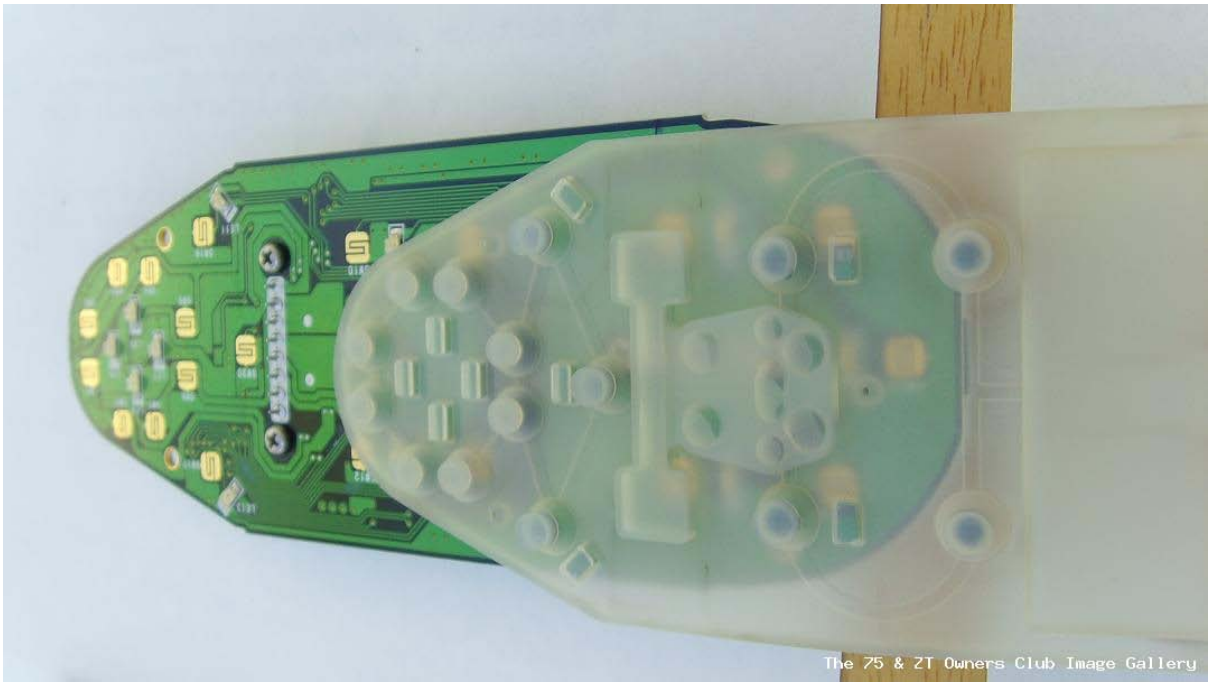
Remove the switchpack from the driver's door by gently levering out with a trim tool, taking care not to damage the surround, and disconnect the two electrical connectors. Take the switchpack to the workbench.

Using a lever such as a small screwdriver, gently pry apart the six plastic clips which hold the bottom of the switchpack on as per the two pictures below (The LOWER clips, not the upper ones:-





Take the switchpack apart until you expose the PCB along with the rubber membrane as shown below:-



Look closely at the PCB and locate switchpad 20 (sw20). Note the small hole below it as arrowed in the picture below:-

You will need to carefully remove the conformal coating around this small hole using a fibreglass pencil or equivalent. BE CAREFUL just to remove the conformal coating and not damage the copper track beneath. Remove just enough coating to expose the circular copper pad and no more.

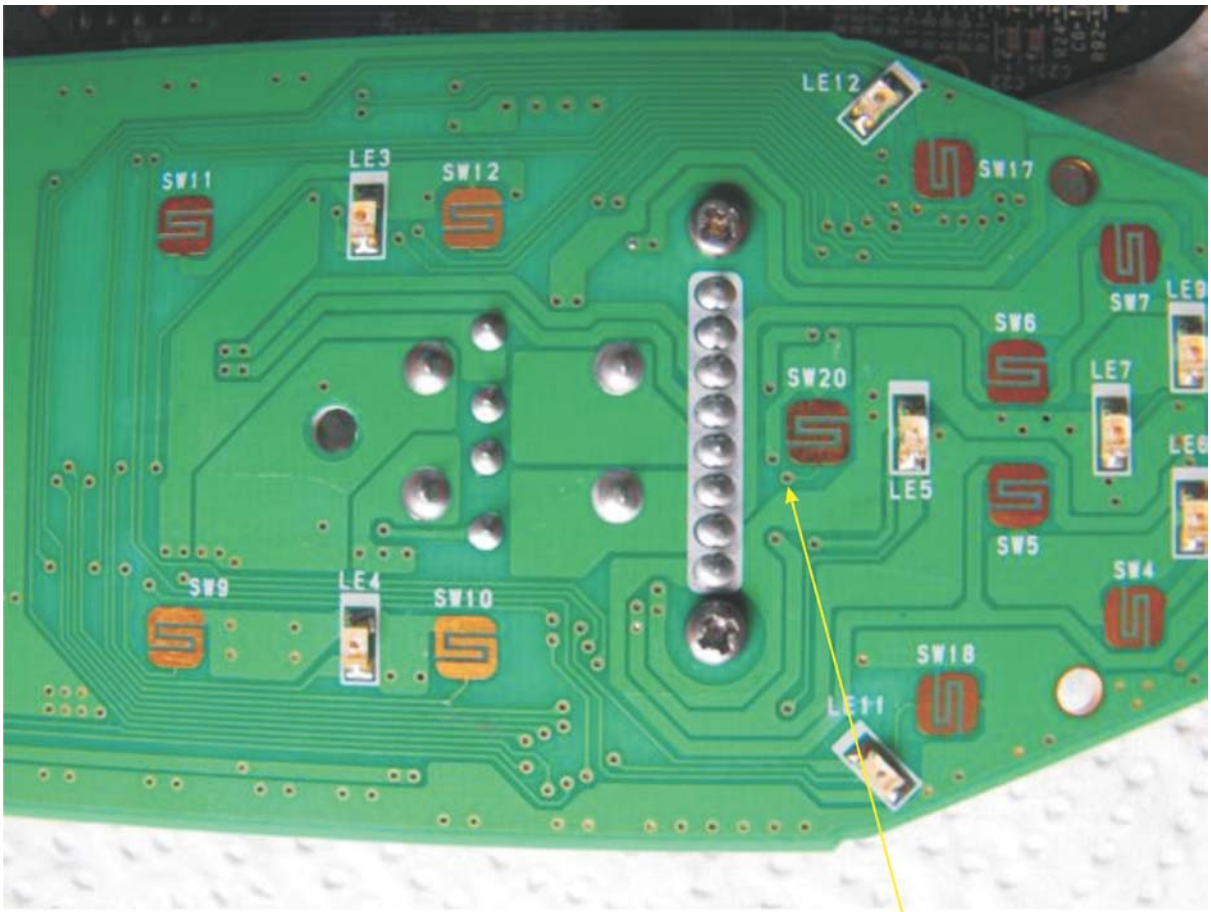
Feed the tinned wire through the hole from the other side and solder it to the PCB track. The hole is VERY small and you might well find that two or three conductor strands are all that will go through.

Drill a small hole in the base of the switchpack plastic housing just wide enough for the wire to pass through. Tie a single knot in the wire such that it then cannot be accidentally pulled out of the switchpack.

Feed the wire through the hole and carefully re-assemble the switchpack, ensuring the wire isn't trapped anywhere. Terminate the wire with a bullet or spade connector.

Make sure the wire is pulled out as far as the knot you used to act as a stop. Even with the safety of the knot, this is not a robust modification and should be treated with care :)

A small dab of silicone sealant on the wire where it exits the body of the switch pack ensures that it can't move unless you want it to.



To test the modified switchpack, re-connect the black and white connectors and switch on the ignition. Momentarily touch the additional wire to earth a few times and confirm that the powerfolds travel fully on each cycle.

NOTE:- Allow each cycle to complete before touching the wire to earth for the next cycle.

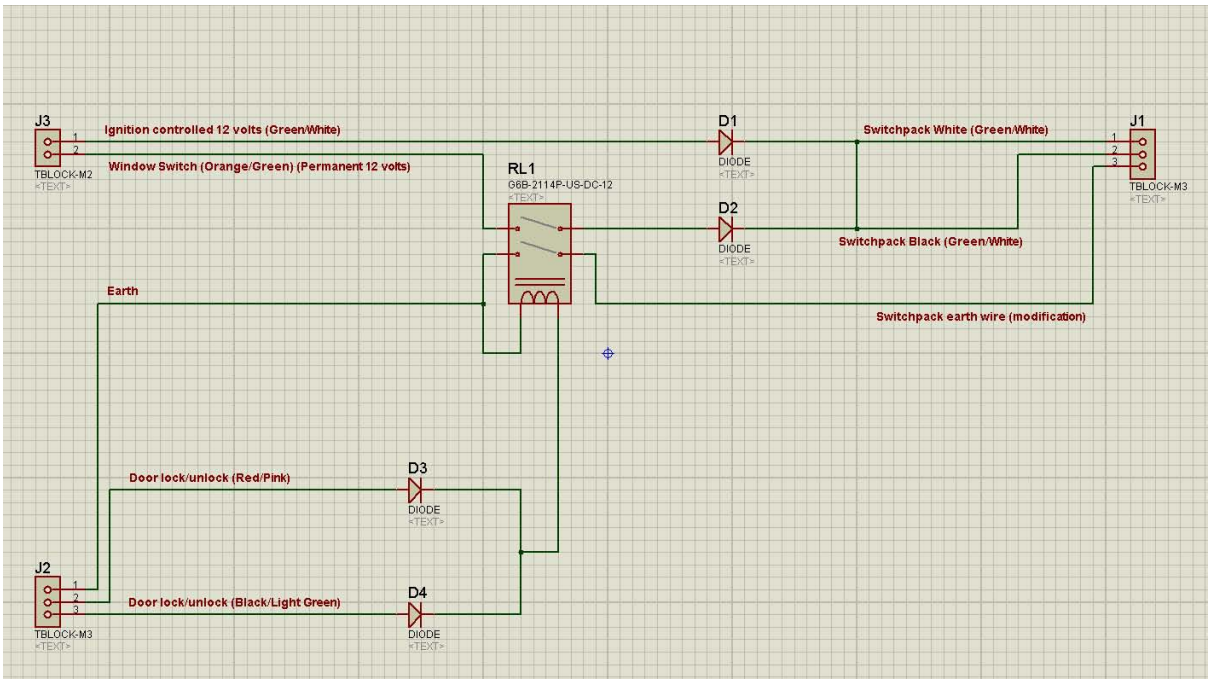
The driver's door wiring modification.

The length of wires in this next part will depend on whether you fit the module in the door or in the trim panel. Cut to length as you see fit.

Use whatever method you like best for splices and joins. Personally I HATE scotchlocks but if you want to use them, so be it.

There are several equally valid ways of doing the wiring and so I've chosen not to include any photographs so as to encourage individual consideration, even though I've had a good selection both of my own and kindly supplied to me be Brian (roverdog).

Please refer to the following diagram:-



There is a bit of a "gotcha" concerning the "Lock" and "Unlock" pulses feeding diodes D3 and D4 respectively. The colour codes given on the diagram seem to hold good for the majority of cars but I am aware that not ALL cars follow this convention so you'll have to do a little bit of detective work as follows:-

The wiring to the door lock solenoid assembly consists of three wires. It is a solenoid with a centre tap for earth, which is what one of the wires is connected to. The other two wires carry the "Lock" and "unlock" pulses and you'll need a volt meter

connected to each wire in turn to work out which is which IF your colour codes aren't the same as in the diagram. Make a note of the colours you need.

The rest of it is plain sailing, as it were.

First of all, find the Green / White wire in both the black and the white connectors which go to the switchpack. One will probably be slightly thicker than the other.

Opening the wiring loom as necessary, trace both wires back until you find the point at which they are joined together and proceed further into the loom as a single wire.

Cut the three wires and discard the joint. Link the SINGLE wire which disappears into the door to the module terminal J3/2. Link the other two wires, from the black and white switchpack connectors, to J1/1 and J1/2.

Link the wire from the modified switchpack to J1/3

Locate the Orange / Green wire from this loom (permanent 12 volts) and splice a wire to it, connecting the other end to J3/2

Locate an earth wire (black), and splice a wire to it, connecting the other end to J2/1

Splice a wire to each of the wires carrying the "Door Lock" and "Door unlock" pulses as identified earlier and connect these wires to J2/2 and J2/3. IT doesn't matter which wire goes to Diode D3 or Diode D4, providing there is one wire to each.

That's the wiring over and done with. Easier to do than to explain ;)

Double check your wiring, ensuring that you have one wire to EACH of the screw terminals on the module.

Testing.

Allow the powerfolds to fully complete each cycle of retraction or extension.

Ensure that the powerfolds are working normally by switching on the ignition and cycling them a few times, ensuring that they end up EXTENDED.

Switch off the ignition.

Close the doors and boot.

Lock the car as normal using the OEM key fob. The powerfolds should retract.

Unlock the car using the OEM key fob. The powerfolds should extend.

That's all there is to it - SEEMPLEZ ;)

Completion.

Once you are satisfied that all is as it should be, seal the module housing if you have chosen to locate the module in the door cavity and secure it in your chosen position.

If you have installed the module in the door trim, ensure that the extended cable loom can be secured in such a way that it cannot foul any moving parts once the trim panel is re-fitted.

Re-loom the wiring. It is important to tidy the wiring up properly so as to ensure that it doesn't foul any moving parts within the door cavity.

Re-fit the door trim.

Finito :D

This is a simple project to do on the car but is quite a handful to produce a 'How-To' about.

I've been as thorough as I can and tried to cover in sufficient detail all the things that I might assume are clear but which might not necessarily appear so to others.

If something is not clear, by all means ask me :)