

RV8 cooling fan modification so the fan can run after the ignition has been turned off



Some time ago Peter Garton had a problem for a short while in the engine bay of his RV8 - the header tank overflowed after switching off the engine. He found that it was due to airlocks in the cooling system which were removed and then the system settled down. In mid-August he was in touch saying "temperatures can easily reach 37°C in Germany during the Summer and recently temperatures in mid-August have been exceptionally high". Peter found that when he returned from a run in his RV8 on a hot day and then parked in an underground car park, the heat from the engine bay was considerable and was very noticeable even though his car park is airconditioned. Peter decided that a modification which allowed the cooling fan to run after the ignition was turned off would be a useful improvement. This note describes this modification.

Wiring modification which allows the fans to run when the ignition is off

Peter went along to his local Bosch workshop and they made a change to the wiring which allows the cooling fan on his RV8 to continue to run for a few moments after switching off the engine until the engine temperature comes down to the lower level when the thermostat turns the fan off. If the heat from the hot engine then transfers more heat to the cooling system and the temperature rises again, then the thermostat can cause the fan to kick in again.

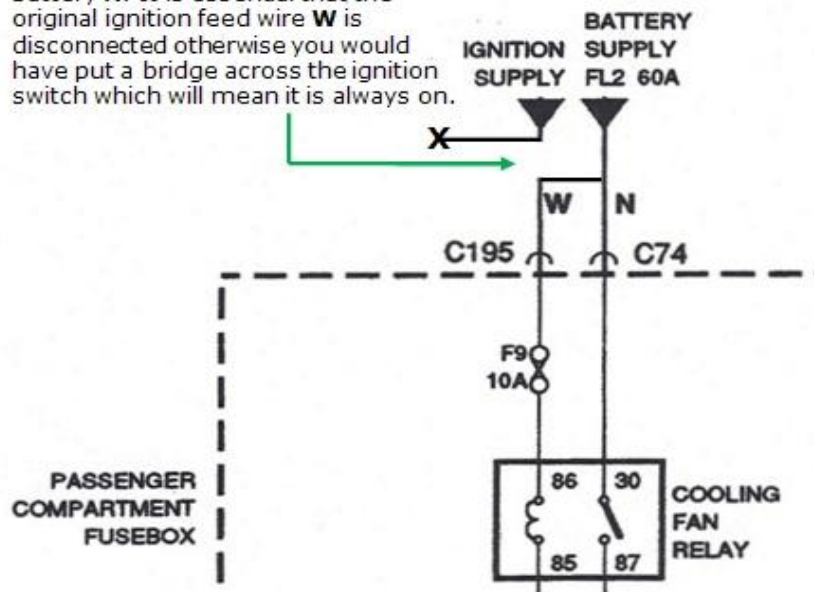
The modification to the wiring is shown alongside as a mark-up on a copy of the wiring diagram in the RV8 Repair Manual – see a page with the heading "Cooling fan" which is page 5 in the Wiring Diagrams section at the back of that manual.

When Bosch made the wiring modification they joined up **W** (the feed to the relay coil) to the live feed from the battery **N**. This ensures permanent power to the fan so that it does not necessarily switch off when the ignition switch is turned off. It is essential that the original ignition feed wire **W** is disconnected otherwise you would have put a bridge across the ignition switch which will mean it is always on.

Now with Peter's RV8 the fan will usually run for 5 to around 20 seconds after switching off the ignition depending on the ambient conditions and the length of the run made in the car, but on a cool day when the engine is not so hot then the fan may not run after the ignition is turned off. On one occasion the fan has come on

after the car has been parked up and then has gone off but then it has switched itself on again but only for another 8 seconds or so.

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In reviewing Peter's report of this useful modification, Bob Owen notes "the feed to the relay coil – **W** in the mark up diagram above - should be **transferred** to the live feed. It is essential that the original ignition feed wire **W** is disconnected (as shown above) otherwise you would have put a bridge across the ignition switch which will mean it is always on." You can see a full page copy of the original wiring diagram on page 3 below.

Peter heard from the Bosch engineer who carried out the work that relay number 2 on his RV8 was replaced with a Bosch 30amp relay part number **0332 209 151** which is a standard part available from several sources. This relay is a standard relay and does not have a delay feature. To the extent the fans can run on after the ignition has been turned off, that delay in their turning off is achieved by the wiring modification and controlled by the thermostat switch and not by a "delay" feature in the relay itself.

Consequences for the RV8 alarm system

Peter refers in his note to a possible issue with the alarm saying "it has never bothered me personally but it might happen that the fluctuation of the current when the fan is activated after the alarm is set could set off the alarm. This has not happened to me so I would advise not provoking this and simply to wait for a few seconds before activating the alarm itself to make sure that the fan won't suddenly start going again." Peter Garton decided he would conduct several tests to

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check whether the alarm on his RV8 would be triggered by the cooling fan switching on. See his report on the tests below.

Caution for RV8 owners with non-standard alarms or immobilisers

Where an RV8 has had an alternative alarm systems fitted as a later addition (for example a Thatcham rated immobiliser), owners should check with the supplier of that equipment about possible effects of the wiring modification described in this note. A year or so after the RV8 was produced a new classification of car alarms was introduced in the UK called "Thatcham". A significant number of RV8 owners have had a Thatcham immobiliser fitted so there is the possibility that the wiring modification described here by Peter Garton might cause those Thatcham systems to throw a wobbly when the cooling fan starts up after the ignition is turned off and the immobiliser is set.

Tests made by Peter Garton to check that when the cooling fan starts to run after the alarm has been set it does not trigger the alarm

Peter Garton reports "I carried out a series of tests and could not get the alarm to sound off. The test procedure was:

1. Deactivated the volumetric sensor
First I deactivated the volumetric sensor so I could reach into the cockpit space in the RV8 normally covered by that volumetric function.
2. Then activated the alarm itself which functioned well - all lights flashing and blinking etc.
3. Then I turned on the side lights which lit up – still with no response from the alarm.
4. Then I turned on the headlights – again no response from the alarm.
5. I then turned to the battery conditioner and plugged it into the cigar lighter first of all. I had unplugged the electrical feed to the charger. I then plugged in the charger into my domestic electricity supply and again nothing so the charger would pump a trickle charge into the battery via the wiring to the cigar lighter. Again no response from the alarm.
6. I then repeated all the tests above with the volumetric sensor activated. Again with no response from the alarm.

I concluded that the wiring modification can be made to an RV8 without creating a problem with the alarm fitted as a Factory feature on the RV8 model. However as a precaution I would, after turning off the ignition when the engine is very hot, "pause" before setting the alarm in case the cooling fan cuts in a second time because from my experience the cooling fan runs on fairly soon after the ignition is cut off when the coolant is very hot. I suggest the "pause" might be around 20-30 seconds maximum after ignition switch-off before activating the alarm.

As a final check I did set the alarm off on its own to double check it was functioning correctly."

Review of this wiring modification by Bob Owen

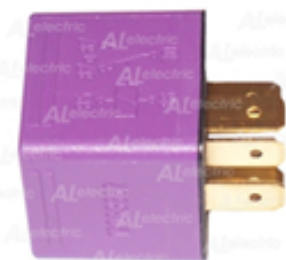
Bob Owen notes "the essence of this modification is the wiring change which allows the cooling fan to run regardless of the state of the ignition switch. The 12V supply to the fan relay on the RV8 is originally fed from the ignition switched supply so the fans cannot run if the ignition is off, even if the temperature sensor switch closes as a result of heat in the block after the engine is stopped. The key feature of this modification is to transfer the feed to the relay coil to a non-ignition switched supply, which is the modification done by the Bosch engineers for Peter Garton and is drawn on the wiring diagram above. Ideally the physical wiring should also be drawn or photographed as the purpose of a wiring diagram is to show the essence of the wiring in a simple form when the physical reality of the position of the wiring is often far from clear. Hopefully later we will be able to get a set of photos to provide an additional illustration of the wiring changes.

What does a relay do? – a brief explanatory note by Bob Owen

The RV8 coolant temperature sensor switch closes when the coolant has reached the "fan-on" temperature activating the cooling fan motor via a relay because the fan motor draws a relatively heavy current. The relay allows a large load, such as the cooling fan motor, to be controlled by a switch with a much smaller current rating. The switch may be mechanical or electronic. The traditional relay comprises an electromagnet (a coil with a soft iron core) plus an armature connected to physical electrical contacts. A current through the electromagnet attracts the armature which moves to physically close (or open) the contacts. A **delay relay** will have some electronics which causes the coil current to continue to flow for some time after the initial stimulus is removed. This is useful for example for courtesy lights. Moreover the physical contacts may themselves be replaced by an electronic device which can either be caused to switch on/off like contacts or whose resistance may be controllable so allowing a dimming action.

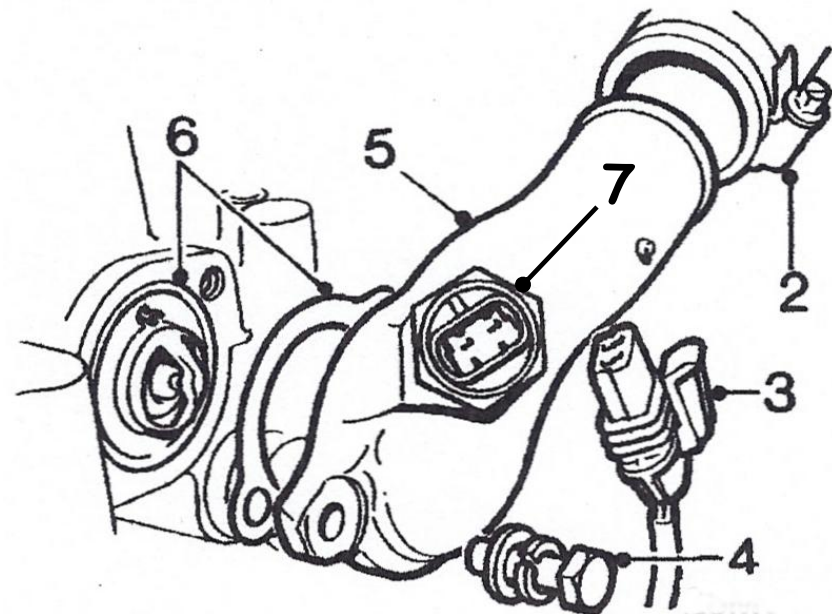
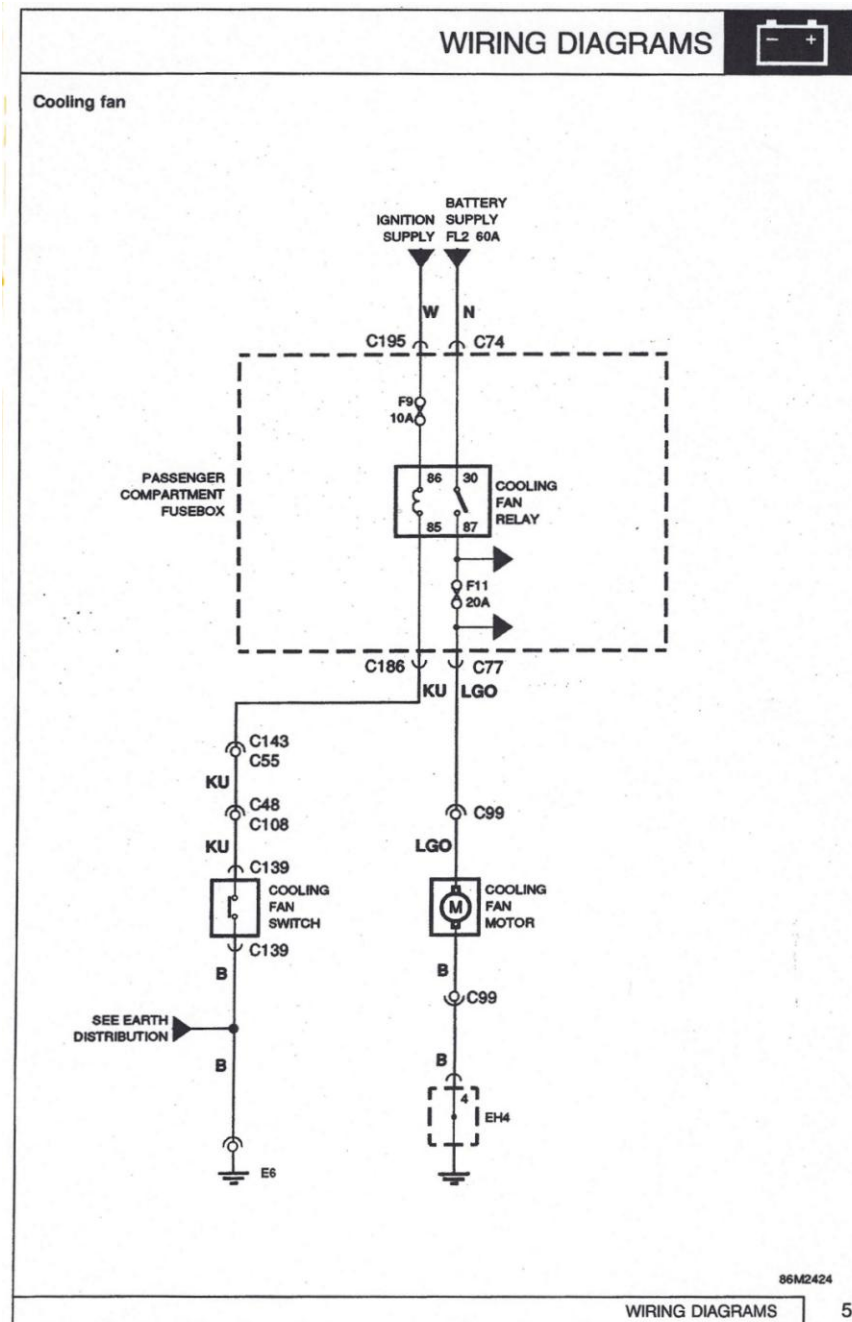


Relay 2 for the cooling fan



Typical relay above

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Thermostat and thermostat switch fitted to the RV8

- 2 - hose clip
- 3 - multiplug from thermostatic switch
- 4 - bolts, plain and springs washer securing thermostat housing cover
- 5 - thermostat housing cover
- 6 - thermostat and gasket
- 7 - thermostatic switch

Wiring diagram

Left, the original wiring arrangement.

Source: diagrams are from the Wiring Diagrams section at the back of the RV8 Repair Manual AKM 7153ENG:

Where can I get a copy of the RV8 manuals?

See full details on the V8 Website at:

<http://www.v8register.net/subpages/BandGRV8technicalinfoCD.htm>