

Many of the complaints I hear concerning the non-running of the Type 4 stationary heater (can it run if it's stationary? - Ed.) are caused by 2 basic problems; components missing, (usually the exhaust), or not functioning (eg the coil). Here is a quick guide to the restoration of your heater, but remember, if it has been neglected for say 10 years, a full overhaul will be needed.

The Eberspacher works on much the same principle as an Ascot water heater. There is a combustion chamber with a sort of pilot light, and when the water tap is turned on (air fan in car), the gas comes on (petrol), is ignited by the pilot (glow plug), and heats the water (air) passing through.

All well and good you may say - however let us not forget the famous VW principle - why make something simple if with a bit more effort you can make it really complicated and hence hideously expensive! The principle and main layout is identical in all Type 4's, the only difference being in the layout of the fuses and control gear. I shall refer to the Variant, but point out the Sedan differences as we go along.

OK here goes Firstly, where is it? and is it all there? The heater is approx. 10" x 20" in size, usually rusty, attached to the body by 4 bolts (sometimes 2) above the gearbox. It is most easily removed when the engine/gearbox is out, and you are lying under the car, feet sticking out the rear (A.K.A. the 'Sunday morning' position). The heater will be largely invisible over the gearbox, with the exhaust pipe leading from the LHS to behind the OSR wheel. If you are going to move or touch this pipe, wear goggles and riggers' gloves, as you will be showered with rust flakes. This pipe is important; if it is undamaged then you are lucky. It is clamped by a rusty fitting, but once the other end is freed, it can be gently eased off in one piece - I had mine shot-blasted then mig-ged a thin bit and painted it with 4 coats of 60% Hammerite - then re-fit with a stainless jubilee clip. New pipes are (probably not any longer, as it's 1997 now) available, Variant 411 261 603A, Sedan 461 261 603B, cost (VAG) £33.05.

On the right, forward of the NS drive-shaft, you will find the fuel feed, consisting of a little white plastic-bowl shaped T-piece, a solenoid pump with 2 wires, and the fabric-covered fuel feed pipe to the heater. Unless you know that this pipe has been changed recently fit new - do not mess about. I will explain this procedure later. On the R/H end of the heater you will see the air fan, which resembles a Black and Decker drill casing, also the main probe which should have a rubber boot covering the three terminals. The final item is the tunnel sensor, which is in the N/S sill, about 18" forward of the beginning of the rear wheel arch. It should have 2 wires connected. Do not attempt to remove this unit.

The heater box levers pull wires in the general VW principle to increase air flow; these must be unbroken and working.

So much for the underside. Now get yourself clean, and have a cuppa. On the Variant, lift the tail-gate and remove the carpet (Sedan: rear luggage space carpet).

Forward of the engine hatch there are usually 2 perforated outlines in the insulating mat, which can be cut away with a Stanley knife and put to one side. Under these there are 2 inspection plates with pozi-head screws. Remove these and you will see the top of the heater, with the glow-plug, fuel feed and the coil. In the Variant, the blower fan is on the LHS of the engine compartment with 2 hoses to the heat exchangers (Sedan: inside the plastic air scoop).

The Variant electrical controls are under the rear seat, below a cardboard flap (Sedan, on LHS of engine compartment, close to the mounting panel for the output). The unit consists of 3 fuses (2 x 8 amp, 1 x 16 amp), a control box with a red lever in the corner, and a relay box. Make sure all wires are connected. The main on/off switch is the floor lever, (which also connects with 2 piano wires to the heater box levers). This lever has a simple contact switch which comes on when the lever is fully up. If it does not move easily to the vertical, check the tension of the cables to the heater boxes, as they may have been adjusted too short. The final component is the panel switch, which should

switch on and rotate clockwise, and by pushing the button in and turning GENTLY clockwise, will set the clockwork timer going; it will run for 5 to 10 minutes.

OK, so now we know where everything is. First job, change the fuel pipe:-

With a pair of long nosed pliers, ease the pipe off the collar underneath the glow plug and attach a piece of string. Then fit the new pipe (2 feet should be enough), attach the other end to the string, pass the pipe back under the car and fit to the plastic elbow - be careful not to break it. I do not use any pipe clips for this job as the pressure is minimal.

Then set the heater back up as follows:- Ignition off; pull floor lever into upright position; go to control box and gently push the little red lever (trip switch). It will make a little "zoink" noise if it has tripped out. Now check the 3 fuses; often one of the 8-amp ones has blown - refit with a 12-amp. Now you are ready to test the heater. Ignition on, then turn the dash switch gently, fully to the right. The light should come on, and the fan (often squeakily), and the solenoid pump should start ticking. Do this job well out of doors, with the car doors open, because if the heater lights up and hasn't been used for a while, the car will fill with smoke - DON'T PANIC! If the heater is going to run, it will ignite within 2 minutes, with a steady roar, and hot air will come through the exhaust. However, more likely, the pump will not cut in, or the system will not ignite - do not blame the glow plug!!

The next stage is to check the coil. Looking at the glow plug you will see 1 brown wire, 1 brown/black (or mauve) wire and an HT lead to the coil. The terminals to the glow plug are fragile, and glow plugs are expensive. With electrician's pliers, disconnect the HT lead, and then the 2 wires, noting which is which (one terminal is cranked). Now gently straighten the cranked one and remove the plug with a normal spark-plug tool. With the plug out, reconnect the leads, earth the body of the plug so you can see the spark (if it's there), and get your trusty assistant to run the heater for 5 seconds. There should be a stream of sparks across the gap, which will be quite noisy. If there is no spark, then the coil is almost certainly at fault. The good news is these are still available, 411 963 201, but the bad news is they cost £60.20 + VAT (1988).

The coil is easily removed with 2 x 8mm studs, and lifts off. Check the unit before discarding; take it to an auto-electrician who will check for an open circuit. The reason the coil fails is because when people put back the glow plug, they fail to bend the cranked tab back, so that when the rubber HT cap is replaced, the HT touches the live feed and blows the coil - at £60.20 you won't make that mistake, will you? OK, we now have a spark, so put the system back together, tidy all wires, refit inspection plates (Sedan only fit 2 screws as the third is obscured by the seat squab). Now run through the start up procedure, and all should be well. Carry out the test with the ignition switched on. Let the heater run for 10 minutes then switch off. The fan should continue to blow fresh air through the heater until it is cool. If the fan motor is really noisy, it may blow the fuse you just replaced, so a squirt of oil will help things go more smoothly.

Hints and tips on keeping your heater working:-

- 1) Always switch the heater on after starting the engine; turn the dial to full on and allow to warm up.
- 2) Always switch the heater off before the engine.
- 3) Always switch the heater off before filling up with petrol.
- 4) If the heater shuts down, leave it to cool for half-an-hour, then check the reset switch. This is a complicated piece of kit, with a trembler switch to shut the unit off in the event of an accident, where the ignition may still be on. However, some of these are so sensitive, especially the 411 Variant, it will trip out if you brake suddenly.
- 5) If the heater does not blow much hot air through the dash vents (2 flat floor levers on 411, or RHS big lever on 412) with the engine off, check the 2 little flaps situated between the casting of the fan housing and the beginning of the heat exchangers are there and working; if not the air blows back through the fan-housing instead of into the car!

I hope this guide will give you cozy toes and effective demisting.

Warmly yours, John Gallimore

Some time earlier:-

This afternoon (Sunday) I finally had to admit that Wolfgang's heating was not up to much; the fan and the pump came on but precious little else. What did the advert say (0 to 20°C in 7 minutes) I should coco. So, up on the stands, it was poke about time. The system was in good repair generally but the fuel supply line from the solenoid pump to the inlet collar (where the glow plug is) was perished (being of fabric covered rubber). As a leak here is potentially explosive, 60p and half an hour is time and money well spent.

The reason for the heater not starting was a poor connection in one of the 3 tags on the probe (like an immersion heater element) due to water having got in past the rubber boot.

With everything reconnected came the moment of truth. Heater lever up, ignition on, click whirr tick tick tick pop roar pop roar two jets of acrid smoke through the eyeballs very soon cleared the heater - and filled the car. A quick run round the town and bliss - full demist and warm toes (what d'ya mean "unreliable at best" Neil?).

John Gallimore 10/87

MORE ON HEATERS :-

Neil Birkett has added some observations of his own (published in 1989):-

"A couple of points arising out of John's article:-

1) The Eberspacher can be removed without pulling the engine/gearbox. Just remove the nearside driveshaft and take off the combustion blower unit (clamp screw) and you can manoeuvre the unit out with a bit of fiddling. Easier still if you remove the nearside shock absorber and coil-spring, as recommended by the Clymer manual.

2) The heater exhaust pipe: On mine I've cut the pipe and fitted a slip joint so that just the end of the pipe can be removed when adjusting valves or removing the engine, to save having to disturb the difficult joint between the pipe and heater unit itself. The reset ("trembler") switch: According to David Platford's articles on the Eberspacher in 'Beetling' magazine (Aug/Sept/Oct 1978) this is designed to shut the heater down if it fails to ignite. It is affected by vibration, but cannot be relied upon to turn off in the event of an accident, and was not designed to do so.

David Platford's articles on the Eberspacher are probably the most definitive available, and are worth getting hold of. The only manual covering it is the Clymer Service/Repair Handbook. On both my last two 412's, I've made the conversion to Type 2 heat exchangers. The standard Type 4 heater boxes contribute very little heat to the system, and if the Eberspacher fails and you have to rely on them alone, you'll find out how useless they are (but see Ralph Marsay's comments on lagging the heat exchangers).

They are only simple metal casings around plain exhaust tubing, with very little surface area to transmit heat to the airflow. If yours are ready to replace, get the van type for a little more money; they're much better value. They have larger casings, and aluminium finned castings inside to transfer the heat. In conjunction with a fully functioning Eberspacher, you'll be able to roast chestnuts in the footwells of your 412. You will need to swap the down-tubes from the engine compartment for the Type 2 sort, and also the bottom cover plates, although you can cut and bend the original ones to fit.

If you use the Type 2 exchangers without the Eberspacher on, you'll need to wire the blower fan to the positive of the coil to operate separately (use a relay here to prevent excessive voltage drop to the coil). Following the conversion to twin carbs, there's some space on the right of the engine compartment, and I'm thinking of fitting a second blower fan. This should produce the ultimate system: Eberspacher plus Type 2 heat exchangers plus dual fan!"

Neil Birkitt