

Ford Galaxy – Auxiliary Heater Information

The information here is based around Mk2 vehicles (2000>)

Version: V3.01

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Preamble:

The 1.9 Diesel Engine in the Galaxy is highly efficient but as a result takes a long time to warm up from cold. In low ambient temperatures this can take as long as 20 minutes so an additional heater is fitted to all UK diesel Galaxy models to boost cold starts in low temperatures.

The aim of this document is to condense as much information as possible about the heater into one document; in most cases it should be possible for any semi-skilled DIY'er to fix the heater. It's worth noting that if you have a Mk2 Ford Galaxy you really have a rebadged VW Sharan/ Seat Alhambra. The Heater is made primarily for the VAG group and as such is generally, poorly supported by Ford dealers.

The heater is made by a well known German company called Eberspacher, and is used by various car, boat and recreational vehicle manufactures to provide supplementary heating. Generally its very reliable with a typical "On" time of about 30 minutes. Unfortunately the implementation in the Galaxy means it can frequently run for just a fraction of that time and it seems this could be the cause of the reasonably high failure rate.

Generally, if you catch the fault quick enough then you should be able to repair it without the need to reset the internal memory of the heater, typically if it "sees" three failed starts due to the same reason it shuts down and locks out further attempts to start. Therefore if its still attempting to start you should be ok, if not then you probably need to erase the fault memory as well.

Components and Locations:

Auxiliary Heater	Under vehicle, under nearside rear door
Ambient Temperature Switch	Clipped to the Windscreen Wiper Mechanism, nearside
Coolant Pump	Back of Engine Bay, top, nearside
Dosing Pump	Under vehicle, under offside rear door next to fuel tank

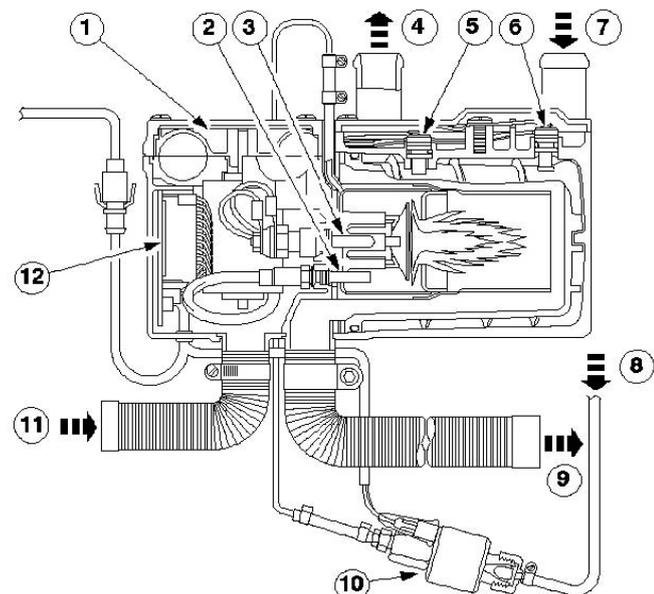
Electrical Circuit:

Electrical Circuit(s): The aux heater has an uncomplicated electrical circuit. It is supplied +12V via fuses 12 and 3 and is grounded back to under the nearside front seat. It has an exclusive relay and air sensor but shares a coolant sensor with the vehicles ECU which monitors coolant temperature and when it is below 75*c energises relay K272. A 12v supply from F19 is then sent to the heaters air temperature sensor and if the external air temperature is below 5*c (10*c for 2003/53> vehicles) then the switch is activated and 12V continues to flow to pin 5 of the auxiliary heaters connector, activating it. The air intake pump starts first (1), slowly, to purge the burning chamber and that's followed by the glow plug (2) and fuel dosing pump (10)

The aux heater houses its own control module (12) and can be interrogated using VAG-Com on Channel 18.

Coolant Circuit:

The coolant lines use T pieces in the engine bay to send coolant to the rear heater matrix (located: behind tailgate trim, near side), an additional electrical pump is fitted to aid flow and continues to run after the vehicle is turned off. These coolant lines run under the passenger side of the vehicle through the booster heater (7 and 4) which can then heat the coolant as it runs to this rear matrix.



Diagnostics:

Diagnosing the heater quickly and easily can only really be done using a piece of software and cable called VAG-Com. If you don't have this and the faults not obvious then ask on forums for local people who may be able to scan the car for you. The "normal" reasons for failure are the glow plug, the water pump, the internal air pump and the dosing pump. Both pumps can be tested using the "Output Tests" option if you have a registered copy – there is further information below in the VAG-Com section.

Glow Plug Fault:

The most common of all the faults we see is the glow plug failing. Replacement is quite strait forward but will require a preliminary disassembly to check which glow plug you have fitted as the units changed in production. Most use the non trailing lead type as detailed below:

Tools you'll need:

- Star Drive bits (Torx) T20 & T25
- Socket set and Flat blade screwdrivers
- New Plug BERU001 VW Part: 7D0-963-319 - £35.41
- VAG-Com or similar diagnostic reset tool



Data Plate from Heater

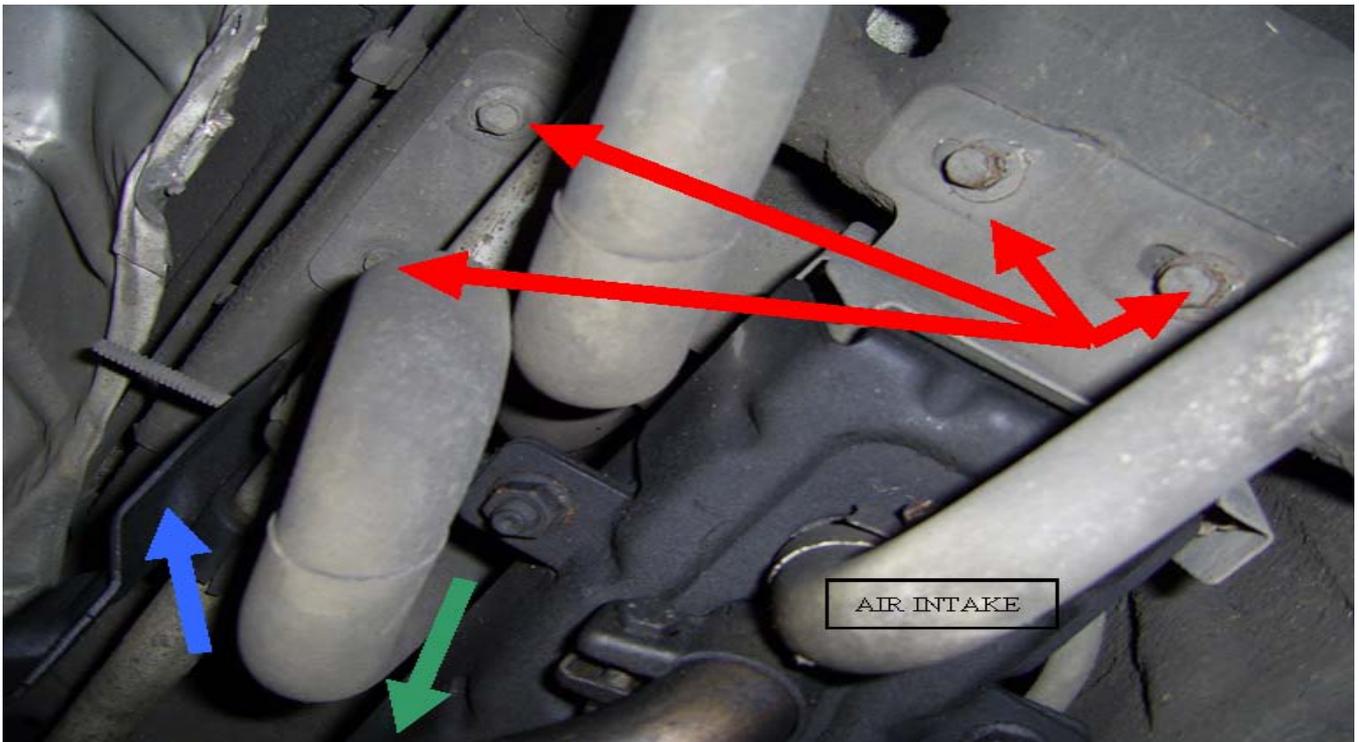
Stage 1 - Heater Removal:

Support the vehicle, engage first/reverse gear and jack the near rear side a little to aid access but leave both rear wheels touching the floor. Locating the heater under the rear door area, in front of the rear suspension mount should be easy and is characterised by its mini exhaust pipe as shown.

First remove the mini exhaust by undoing the bolts arrowed in red. Next undo the jubilee clip using a flat blade driver and remove the air intake pipe next to the exhaust – arrowed in blue. Its pushed into a rubber mounting in the sill and simply pulls out.



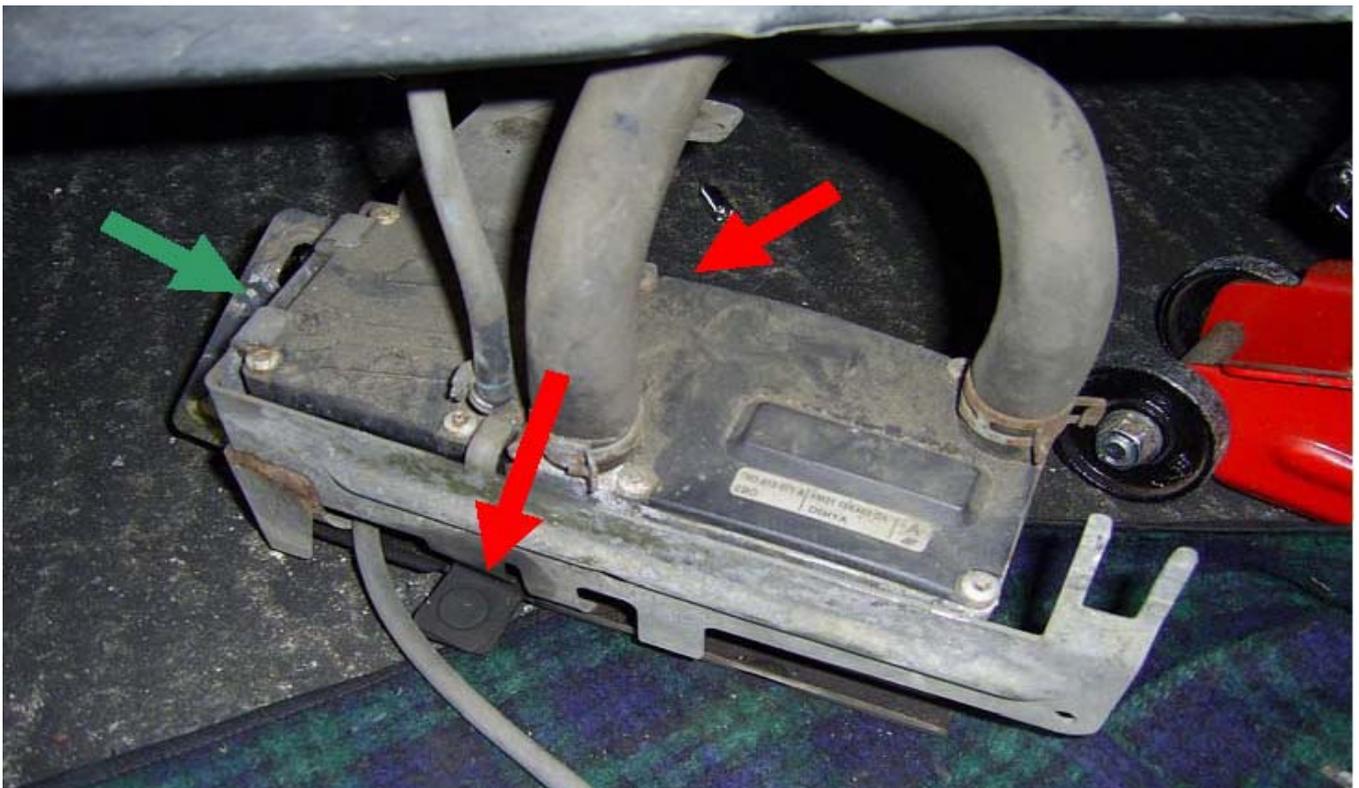
The next step is to drop the heater from the underside of the vehicle. Disconnect the wiring connector (Green arrow on following image) This is probably the most fiddly part of the job as its not only tight but space is very limited. If you can't undo it then find something to support the heater, do the next step and then try again. The unit should be free to drop down with both the coolant and fuel pipes still attached once the 3 bolts and 1 screw arrowed are removed (air intake and exhaust still in situ in this photograph for identification). Take note of the coolant pipe locations as they are curled up slightly above the heater to allow it to drop down freely if the rear wheels were not elevated off the ground.



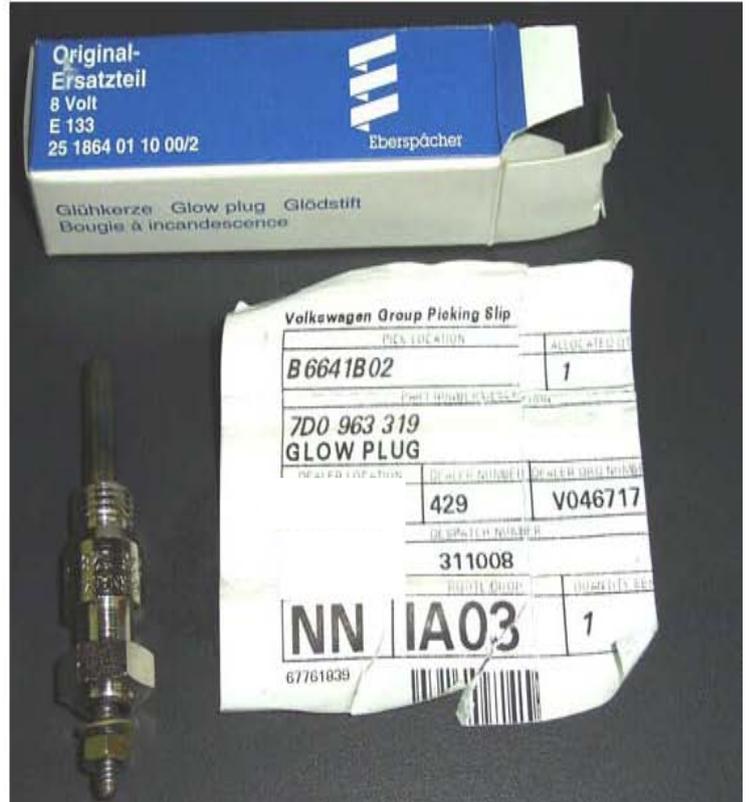
There are 3 screws that hold the exhaust bracket and coolant pipes to the underside (blue arrow) which can be left in place or removed to aid access if required. Care must be taken that the pipes are not stressed and that the diesel feed is not damaged when lowering, however the heater is surprising light and easy to manipulate

Stage 2 – Plug Replacement:

With the heater dropped work can now start on replacing the glow plug. Remove the two bolts (arrowed red) and split the metal surrounding frame. Next remove the two torx screws and two torx bolts on the units left side. NB: Take note of where the bolts come from as they are different sizes. With these removed the side panel can be released – slide it off using a flat blade driver to carefully prise if needed. Once released, disconnect the internal connector and remove the panel completely.



The glow plug can now be seen, remove the small nut and washer, then unscrew and remove the old plug. Replace with the new one and renew the nut and washer. The plug and nut should not be over tightened! Replace the side cover ensuring the connector is made and that the cover slides into its locating slots. Tighten the bolts and screws but again don't over tighten the screws! Refit the unit to the underside of the vehicle taking care not to damage the wiring connector or trap the diesel line.



Vag-Com:

If you intend to maintain a Galaxy yourself then you should consider investing in this invaluable bit of kit which can be used for testing, measuring and diagnostics on a whole host of controllers dotted around the car. For this PDF though we are only interested in Module 18 – Auxiliary Heating.

Opening that controller connects directly to the auxiliary heater. If you've replaced the glow plug there is a strong chance you'll now need to go into 02- Fault Codes and clear them to allow the heater to attempt a start again.

Use "Output Tests" to check the operation of the internal blower and then the dosing pump – only briefly leave the dosing pump in the on state to avoid flooding the chamber with diesel.

Use "Measuring Blocks" to see the values of the heaters sensors and switches – this can be very helpful in determining how the heater is operating.



The first section relates to temperatures:

- 1 - System Voltage, with the engine running this should be around 13V
- 2 - Combustion Temp, this is the temp inside the chamber – expect up to about 330*c
- 3 - Coolant Input Temp, this is the temperature on the intake side of the heater
- 4 - Coolant Output Temp, this is the temperature on the output side of the heater

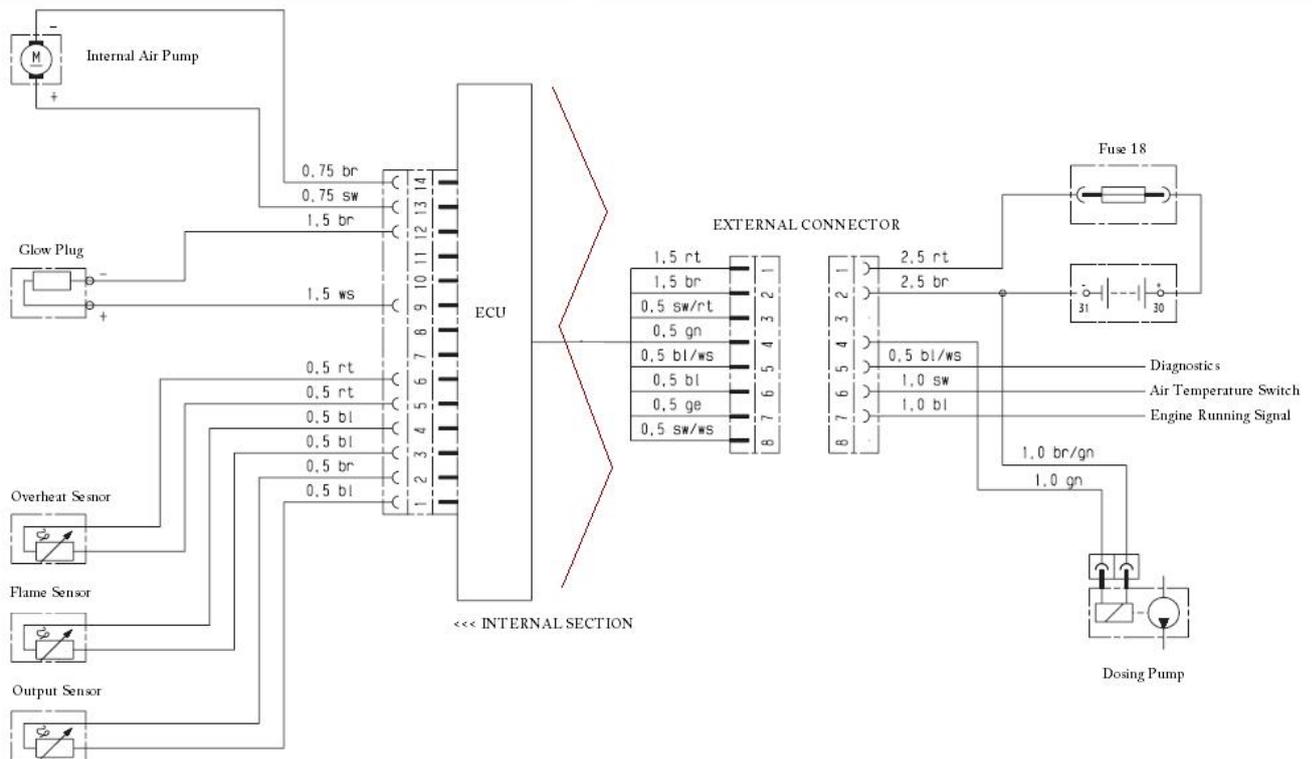
The second section relates to the heaters operational status (Readiness):

- 1 - Heater Enabled, should be on when the heater is enabled
- 2 - Ext. Temp. Switch, should change to on when the external temp switch is below 10*c
- 3 - Not Used
- 4 - Not Used

The third section relates to the heaters sensors

- 1 - Air Blower Status, shows the systems expected state of the air blower
- 2 - Flame Sensor, shows the systems expected state of the flame sensor
- 3 - Fuel Pump Status, shows the systems expected state of the dosing pump
- 4 – Not Used

Electrical Schematic:



Technical data for the diesel heater:

Heater **D 5 W - Z**

Heating medium: Water / cooling fluid

Control: High and Low

Heat Output (watts) High: 5000 Low: 2400

Fuel consumption (l/h) High: 0,62 Low: 0,27

Mean electrical power (watt) in operation High: 37 Low: 10

Operating range

- Lower voltage limit: under voltage protection at 10,2 volts
- Upper voltage limit: an overvoltage protection at 16 volts

Minimum water flow rate for the heater 250 l/h

Tolerable operating temperature operation heater $-40\text{ }^{\circ}\text{C}$ to $+80\text{ }^{\circ}\text{C}$

Interference suppression class 5 for VHF, SW, MW, 2 for LW

Weight

- without controller and cooling fluid ca. 2,3 kg
- with dosing pump and water pump, ca. 2,5 kg

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