

F 4.1 Description of Heating System

The heater is switched on by pulling out the switch.

The electric motor for the hot air and combustion air blowers, the glow plug (via the flame detector switch) and the electric fuel pump are then energized.

The combustion air blower starts delivering air which mixes with the fuel which is supplied by the fuel pump via the pressure regulator. This mixture is then injected into the precombustion chamber.

The glow plug warms the combustible fuel/air mixture in the precombustion chamber and ignites the mixture. Combustion then extends to the combustion chamber and starts to heat the heat exchanger. When the flame has heated the sensor tube of the flame detector switch to a certain point, the current flow from the flame detector switch to the glow plug is interrupted. Now the mixture continues to burn by self-ignition.

The hot air blower draws air from the vehicle interior and forces it past the heat exchanger where it is heated to approx. 194 ° F (90 ° C) above the intake temperature.

Due to the larger size of the hot air blower, the pressure on the hot air side of the heat exchanger is higher than the combustion pressure. This ensures that no exhaust gases can get into the hot air and thus into the vehicle interior even if the heat exchanger is leaking.

The heater is switched off by pushing the switch in. This stops the current flow to the fuel pump and combustion ceases.

The motor for the hot air and combustion air blower, however, continues to run. This cools the heater down evenly and blows all traces of gas out of the combustion chamber.

The warning lamp is out during the run-on period. After about 3 minutes the flame detector switch cuts off the current supply to the motor. The run-on is then completed and the heater out of operation.

The heater has an overheating switch which cuts the current supply to the fuel pump by shorting (blowing) the 8 ampere fuse. This will stop combustion in case the heater gets excessively hot.

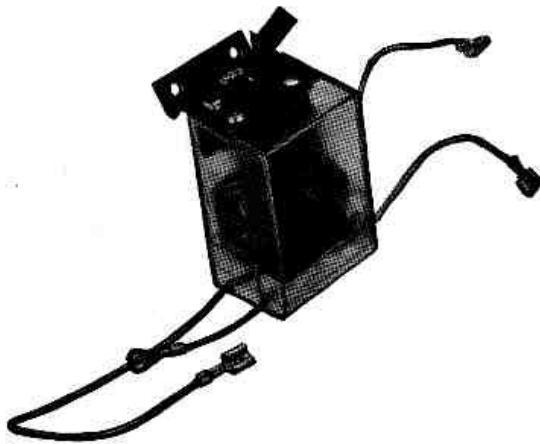
F 4.1 Description of Heating System



Flame detector switch

The flame detector switch is secured to a thread on the heat exchanger by a union nut. The sensor tube protrudes into the combustion chamber. The flame detector switch controls the cut-in time of the glow plug, the heater resistor, the safety switch and the run-on.

NC – normally closed
NO – normally open, safety switch, relay and glow plug
C – Common, combustion air blower
1 – Union nut



Safety switch

The safety switch is secured to the heater casing. It interrupts the flow of current to the heater if ignition has not taken place within four minutes after the heater has been switched on. The same applies if for some other reason combustion does not take place. The heat resistor in the safety switch activates a bi-metal strip. This bi-metal strip will move out of its normal position after three minutes because of the increase in temperature. This will then interrupt the current to the heater.



Pressure regulator

The pressure regulator is secured to the heater casing. It keeps the amount of fuel delivered at a constant level.

F 4.2 Trouble Shooting

A – Heater does not work

Check	Possible fault	Remedy
1 – Current supply interrupted, 16 ampere fuse blown	Short circuit in system	Check for wiring fault (see wiring diagram on page F 4.1/5). Rectify defect and replace 16 amp. fuse
2 – Safety switch has switched heater off (see wiring diagram, page F 4.1/5, item 13)	a – Flame detector switch has not operated b – Mixture has not ignited because glow plug is defective	a – Check switch and replace or adjust (see F 4.3/1) b – Replace glow plug (see F 4.5/1)
3 – 8 amp. fuse has blown (see F 4.1/5)	Heater has overheated and overheating switch has operated a – Hot air short circuit – the hot air from heater is drawn in again because the outlet is directing the hot air into the intake elbow b – Air ducts blocked	a – Turn the hot air outlet b – Clear the ducts
4 – Voltage drop	Battery voltage low	Start engine so that generator voltage is available. If necessary, remove and charge battery
5 – Glow plug (see F 4.3/1)	Glow plug filament broken	Replace glow plug (see F 4.5/1)
6 – Fuel	Tank empty	Fill tank
7 – a – Filter b – Strainer in pressure regulator (see F 4.8/1) c – Jet	a – Filter bowl full of water or strainer dirty b – Strainer blocked c – Jet blocked	a – Empty the bowl and clean with compressed air (see F 4.3/2) b – Clean strainer c – Clean jet with compressed air

1-2 Heater does not work

Trouble Shooting **F 4.2**

Check	Possible fault	Remedy
8 – Fuel pump (see F 4.6/1)	<ul style="list-style-type: none"> a – Pump drawing in air (pump works unevenly or too fast) (see F 4.6/1) b – Pump not working (short circuited or contacts burnt) (see F 4.3/1) c – Valves in pump housing sticking 	<ul style="list-style-type: none"> a – Check line from tank to pump for leakage b – Check contacts, clean and adjust. Replace pump if necessary. Check 8 amp. fuse (see F 4.1/5) c – Clean valves (see F 4.6/1)
9 – Flame detector switch	<ul style="list-style-type: none"> a – Flame detector switch not working in the specified period b – Flame detector switch not working 	<ul style="list-style-type: none"> a – Adjust flame detector switch (see F 4.3/1) b – Replace flame detector switch (see F 4.5/1)
10 – Relay	<ul style="list-style-type: none"> a – Contacts defective b – Diode defective (see F 4.3/1) 	<ul style="list-style-type: none"> a; b – Replace relay (see F 4.5/1)
11 – Blower motor	<ul style="list-style-type: none"> a – Motor does not attain prescribed speed b – Motor not working (see F 4.3/1) 	<ul style="list-style-type: none"> a; b – Check motor, replace if necessary (see F 4.5/1 and 4.3/1)
12 – Shortage of combustion air	<ul style="list-style-type: none"> a – Intake pipe blocked b – Exhaust pipe blocked 	<ul style="list-style-type: none"> a; b – Clean (see F 4.4/1)

F 4.2 Trouble Shooting

B – Heater smokes

Check	Possible fault	Remedy
1 – Combustion air intake pipe or exhaust pipe blocked (see F 4.2/1)		
2 – Pressure regulator	a – Defective b – Incorrectly adjusted	a – Replace (see F 4.5/1) b – Check and adjust (see F 4.3/1)
3 – Fuel pump	Incorrectly adjusted	Adjust correctly (see F 4.3/1)

C – Heater goes out

Check	Possible fault	Remedy
1 – Heater not getting sufficient fuel (see F 4.2/1, point 7)		
2 – Shortage of combustion air (see F 4.2/1, point 12)		
3 – Overheating switch has operated – 8 amp. fuse blown (see F 4.2/1, point 3)		