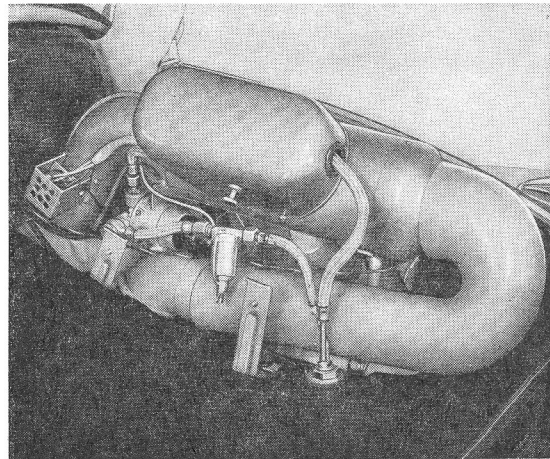


Recirculating heater B 2 for Type 1 (up to August 1970)

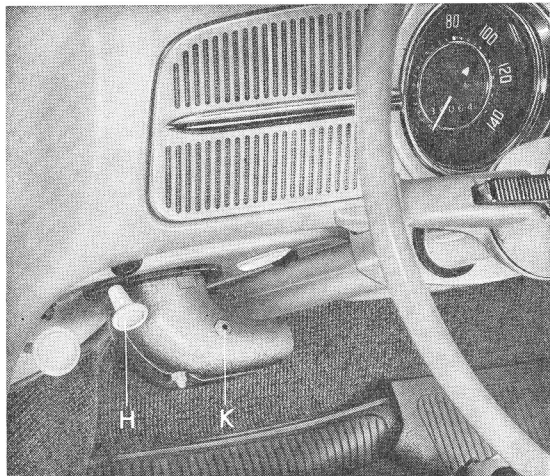
Operation



The heater is switched on and off with a push-pull switch underneath the instrument panel on the left. When the heater is switched on, the electric motor for the fresh air and combustion air blowers receives current via a rotary switch and the heater plug in the antechamber and the fuel pump are also supplied with current. The combustion chamber is surrounded by a heat exchanger in which the fresh air is heated up. The heater is enclosed in a sheet metal housing which carries the various parts.

As soon as the heater is put into operation, combustion air is drawn in and fuel flows from the fuel pump through the jet carrier into the combustion chamber where a combustible mixture of fuel and air is created. This mixture is ignited by the heater plug and the flame contacts the feeler tube of the thermo-switch and switches the heater plug off. The warning lamp in the warm air outlet pipe then lights up and shows that the heater is working properly. Further ignition takes place automatically. When the electric motor starts to turn, fresh air is drawn in, heated to about 90° C (194° F) above the outside temperature, and passed through the warm air outlet to the interior of the vehicle.

F 5.1 Description of Heating System



Operating instructions

Switching on

Pull knob H: The warning lamp K in the warm air outlet will light up after about 45 seconds and show that the heater is working properly.

Switching off

Press knob H in. The heater will then switch off automatically after about 3 minutes. The warning light K will then go out and show that the run-on period is ended.

Note:

When the heater is switched off, the blower motor continues to run until the heater has cooled off slightly and the combustion chamber is free of gas.

The warning light remains on during this flushing period and the heater must not be switched on again until the warning light has gone out.

When it is very cold, the full battery capacity is required to start the engine. To avoid starting difficulties, it is advisable not to switch the heater on until the engine is running. It is also recommended that the heater is not left on for more than 30 minutes when the engine is not running, to avoid exhausting the battery.

Maintenance

Deposits from the fuel tend to settle in the fuel system of the heater when it is not used for long periods. To avoid trouble, it is advisable to operate the heater briefly about once a month when the heater is not in regular use.

Every year before heater is put into use:

- Check condition of glow plug and renew if necessary.
- Clean filter and jets in jet carrier.
- Check security of electrical connections.

During the winter or when driving over very poor roads, mud or snow may tend to accumulate on the exhaust and combustion air intake pipes. Have these pipes checked for blockage from time to time so the heater can continue to work properly.

Technical Data

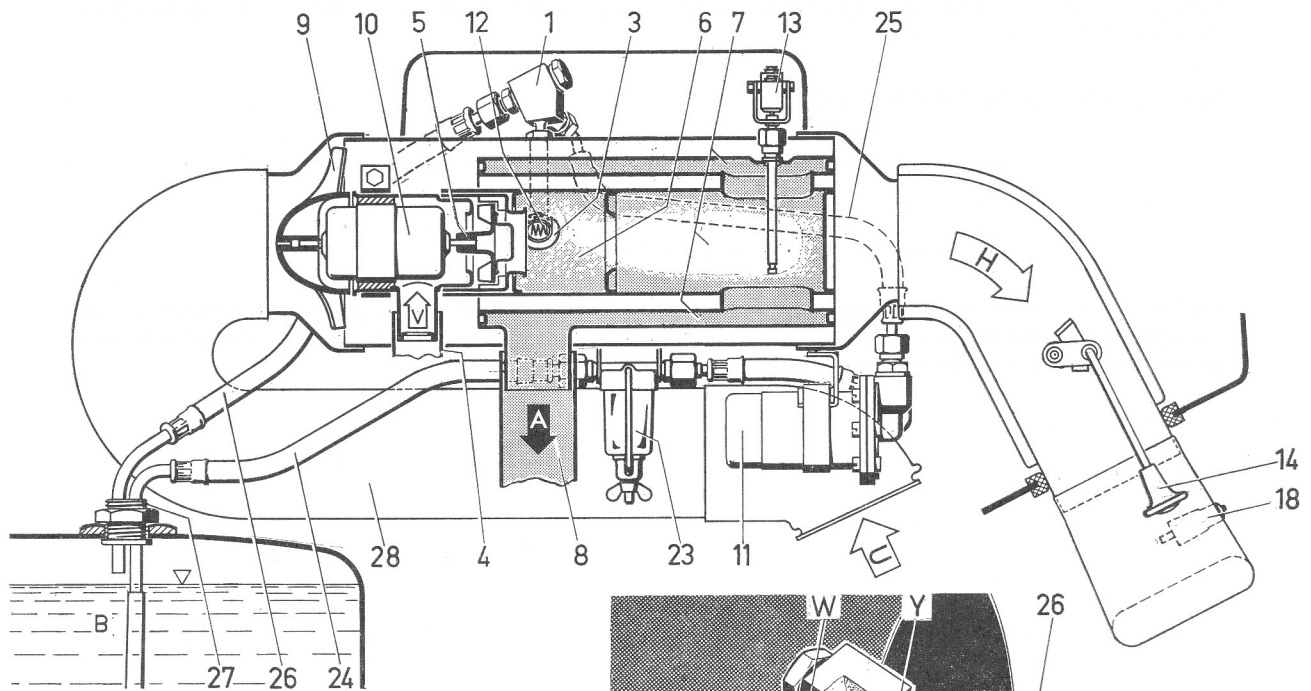
| | |
|---|--|
| Heat output | 1750 kcal/h |
| Fuel | Gasoline |
| Fuel consumption | 0.27 liters per hour (approx. .5 pint per hour) |
| Current consumption | 20 watts |
| Current consumption (when glow plug is on) | 140 watts |
| Voltage | 12 volt |
| Warm air temperature (above intake temperature) | approx. 90° C |
| Air capacity | approx. 65000 liters per hour |
| Weight of heater | 5.5 kg |
| Run-on time | 150–200 seconds |

The response temperature (125–180° C) of the overheating switch is checked by partly blocking the intake duct (about $\frac{2}{3}$ of area).

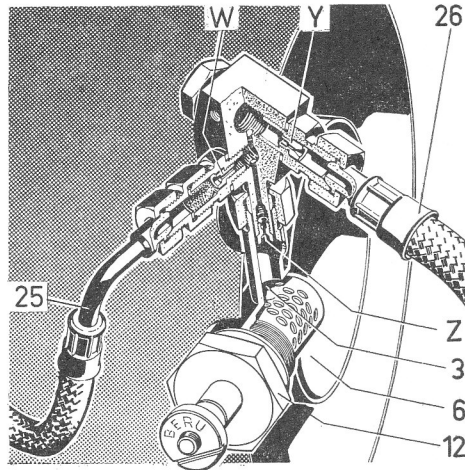
If heater smokes badly, check the blower speed. This should be 4 550–5 400 rpm at 12 volts.

F 5.1 Description of Heating System

Working principles



W – Feed jet (0.325 mm)
 Y – Overflow jet (0.75 mm)
 Z – Metering jet (0.325 mm)



A – Exhaust gas B – Fuel U – Circulating air H – Hot air V – Combustion air

- 1 – Jet carrier
- 3 – Antechamber
- 4 – Air intake pipe
- 5 – Combustion air blower
- 6 – Combustion chamber
- 7 – Heat exchanger
- 8 – Exhaust pipe
- 9 – Hot air blower
- 10 – Electric motor
- 11 – Electric fuel pump

- 12 – Glow plug
- 13 – Thermo-switch
- 14 – Control knob
- 18 – Warning lamp
- 23 – Fuel filter
- 24 – Fuel suction line
- 25 – Fuel pressure line
- 26 – Fuel return line
- 27 – Tank connection
- 28 – Air circulation pipe

The heater has a heat exchanger which consists of a cylindrical combustion chamber and a concentrically arranged annular chamber. These chambers are connected by two channels so that at one point the exhaust gases are flowing through the heat exchanger in a reverse direction. In the front part of the cylindrical space the combustion chamber (6) is sealed on the blower side by a safety ring and limited on the heat exchanger side by a flame nozzle.

The blower consists of an electric motor (10) which has an axial blower (9) for the fresh air on one end of the shaft and a radial blower (5) for the combustion air on the other end. As the static pressure is higher on the fresh air side than on the gas mixture side there is no danger of the exhaust gases getting into the fresh air and thus into the passenger compartment even if the heat exchanger (7) is leaking.

The **glow plug** (12) only works for a short period after the heater has been switched on. It is supplied with current via the thermo-switch (13). The thermo-switch cuts the current to the heater plug off as soon as the feeler tube of the switch is heated by the flame.

Note:

The heater plug on the 12 volt heater (Heater No. 20 1246) is equipped with a series resistance. The resistance is fitted in a screening cover which is mounted on the heater casing.

In the **antechamber** (3) the fuel is mixed with the combustion air and ignited. The actual combustion takes place in the combustion chamber (6) and the heat exchanger (7) attached to it.

The **jet carrier** (1) has three jets: A control jet W, an overflow jet Y and a feed jet Z. The control jet regulates the quantity of fuel flowing into the jet carrier. The feed jet Z controls the quantity flowing to the heater and the overflow jet Y regulates the pressure in the jet carrier and diverts excess fuel back to the tank.

The **fuel pump** (11) draws fuel from the vehicle tank through an adapter (27), which also houses the fuel return line (26) (see illustration).

The **fuel suction line** (24) from tank to electric pump (11) includes a filter (23) with a water separator.

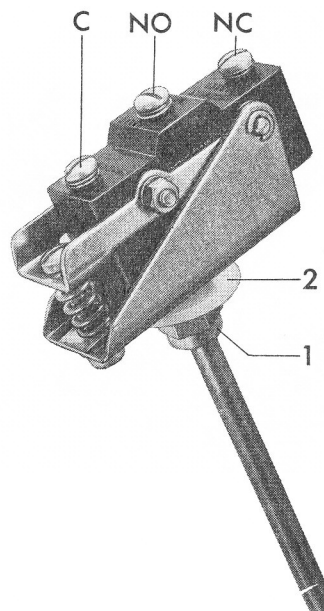
The **exhaust pipe** (8) is sealed with a heat-resistant silicon ring where it passes through the body panel.

The **warning light** on the warm air outlet shows that the heater is working properly. It lights up about 45 seconds after the heater has been switched on and goes out about 2½ to 3 minutes after the heater has been switched off.

Thermo-switch

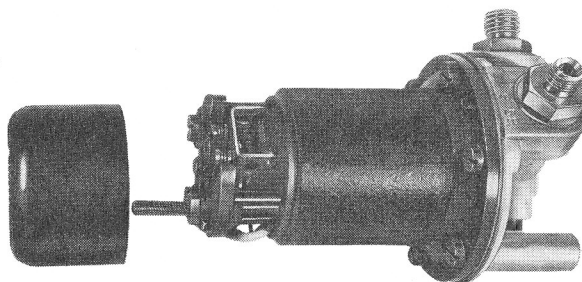
The thermo-switch is secured to a thread on the heat exchanger by a union nut. The feeler tube projects into the combustion chamber. The thermo-switch controls the operation time of the glow plug and the run-on time.

- NC – Normally closed
- NO – Glow plug connection
- C – Combustion air blower connection
- 1 – Union nut
- 2 – Washer



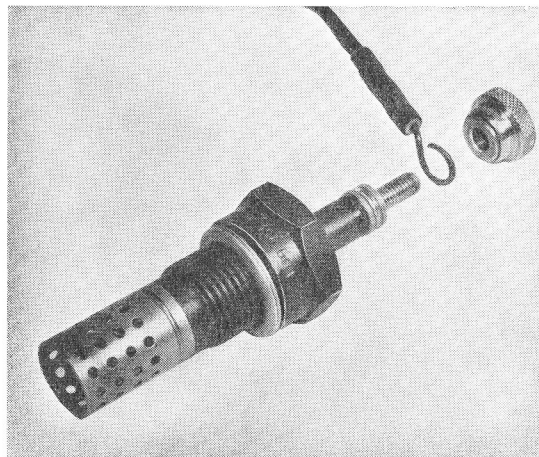
Fuel pump

The fuel pump is secured to heater with a clip.



Glow plug

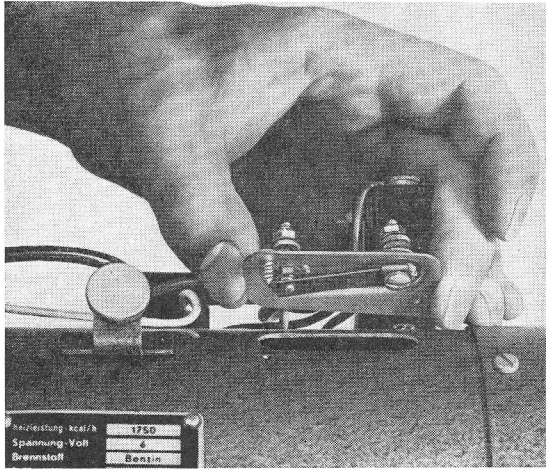
The glow plug projects into the combustion chamber. The plug works at a voltage of about 4 volts. Nominal voltage 3.2 volts, nominal current 10 amps.



Series resistance

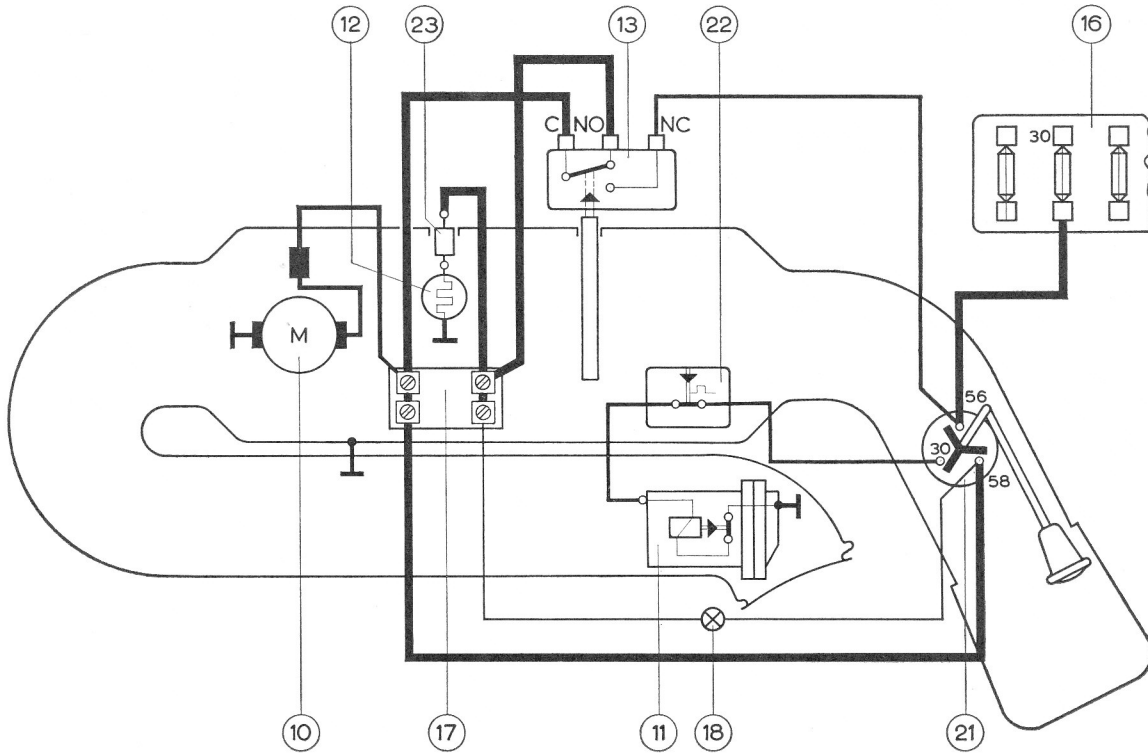
The series resistance is fitted on the heater under a cover plate.

F 5.1 Description of Heating System



Overheating switch

This switch is attached to the casing of the heater. It operates when the heater temperature rises excessively.



- 10 – Electric motor
- 11 – Fuel pump
- 12 – Glow plug
- 13 – Thermo-switch
- 16 – Fuse box

- 17 – Cable connector
- 18 – Warning lamp
- 21 – Heater switch
- 22 – Overheating switch
- 23 – Series resistance

List of possible defects

It is only possible to localize a defect by testing the heater systematically. For this reason, trouble shooting should always be carried out in the sequence given here.

The following conditions may be found:

- A – Heater does not work (see F 5.2/1–2)
- B – Heater goes out (see F 5.2/1–3)
- C – Heater does not switch off (see F 5.2/1–3)
- D – Heater smokes (see F 5.2/1–4)
- E – Heat output inadequate (F 5.2/1–4)
- F – Excessive glow plug wear (F 5.2/1–4)

If one of these conditions is found, the heater must be checked as explained on the following pages.

F 5.2 Trouble Shooting and Testing Instructions

A – Heater does not work

| Check | Possible defect | Remedy |
|--------------------------------|--|--|
| 1 – Current supply interrupted | Fuse blown | Check heater, rectify fault, install new fuse in holder in cable. |
| | No ground connection | Clean contact surfaces of ground strap between battery and body (examine battery terminals). |
| | Main cable on switch incorrectly connected | Feed cable must be connected to terminal 56 (see F 5.1/4-1). |
| | Terminal plate contacts faulty | Check connections and tighten. |
| | Thermo-switch incorrectly set or defective | Adjust thermo-switch (see instructions) or replace (see F 5.3/1-2). |
| | Motor and fuel pump circuit defective | Check continuity and voltage. |
| 2 – Voltage drop | Poor ground connection | Check ground connection from battery to vehicle frame, and between heater and body. |
| | Battery voltage low so that heater plug does not glow properly | Start engine to get full generator voltage. If necessary, remove and charge battery. |
| 3 – Glow plug defective | Glow plug coils bent | Straighten and clean coils under 4 Volt current (2 battery cells) (see F 5.3/1-1). |
| | Glow plug damaged | Fit new plug (Beru 194 Grn.) (see F 5.5/1-2). |
| 4 – No fuel | Vacuum in tank | Check tank breather pipe (iced up in winter). |
| | Tank empty | Fill tank. |
| | Fuel feed interrupted | Check if fuel flows from jet carrier (by removing return pipe). |
| | Fuel feed, filter or jets blocked | Check and clean, fuel pipes, fine filter in jet carrier and jets. |
| | Fuel pump drawing in air (Pump works unevenly or too fast) | Check pipe from tank to pump for leaks, particularly at the filter and filter glass. |
| | Fuel pump does not work (Short circuit or burnt contacts) | Check contacts, replace pump if necessary (see F 5.3/1-1). |

| Check | Possible defect | Remedy |
|--------------------------------|--|---|
| 5 – Blower motor defective | Motor does not reach the specified speed of 4550–5400 rpm. | See “Voltage Drop” under 2. |
| | One of the blowers rubbing on housing | Straighten (see F 5.5/1–5). |
| | Motor defective | Motor must be replaced (see F 5.5/1–5). |
| 6 – Shortage of combustion air | Radial blower loose or damaged | Secure or replace (see F 5.5/1–5). |
| | Screening cap detached | Fit new radial blower. |
| | Combustion air pipe dirty or blocked | Clean pipe. |

B – Heater goes out

| Check | Possible defect | Remedy |
|------------------------------------|---|---|
| 7 – Shortage of fuel | See “No fuel” under point 4 | |
| | Suction and return pipes badly routed | Return pipe must not be kinked or hang down. |
| 8 – Shortage of combustion air | See “Shortage of combustion air” under point 6 | |
| 9 – Exhaust back pressure too high | Exhaust pipe partially blocked | Clean exhaust pipe. |
| 10 – Electrical circuit faulty | Overheating switch has worked and cut off current | Check for reduced cross section in outlet duct. Check fresh air blower for short blades. Blower must be replaced even if only slightly damaged. |

C – Heater does not switch off

| Check | Possible defect | Remedy |
|--------------------|-------------------------------|---|
| 11 – Thermo-switch | Thermo-switch incorrectly set | Adjust thermo-switch (see repair instructions). |
| 12 – Main switch | Switch defective | Fit new switch. |

F 5.2 Trouble Shooting and Testing Instructions

D – Heater smokes

| Check | Possible defect | Remedy |
|----------------------|---|---|
| 13 – Excess fuel | Overflow jet in carrier or return line blocked | Check jet and line, blow out with compressed air. |
| | Feed and metering jets incorrect size | Install correct jets (0.325 mm) (see F 5.5/1-1). |
| 14 – Shortage of air | | See points, 5, 6 and 9. |
| | Heater smokes when used with vehicle engine not running | Start engine to get full generator charge. Charge. See if smoking stops, if so, charge battery. |

E – Heat output inadequate

| Check | Possible defect | Remedy |
|-------------------------|---|--|
| 15 – Insufficient fuel | Fuel lines, filters or jets blocked | Check and clean lines, filters and jets (see F 5.5/1-1). |
| | Pump drawing in air or not delivering sufficient fuel (pump works unevenly or too fast) | Check line from tank to pump for leaks. Watch sealing and sight glass or filter (see F 5.5/1-1). |
| | Hose leaking | Replace hose. |
| | Pump diaphragm damaged | Replace pump (see F 5.5/1-2). |
| 16 – Poor heat transfer | Heat exchanger full of carbon deposits | Clean (see instructions). |

F – Excess glow plug wear

| Check | Possible defect | Remedy |
|---|---|--|
| 17 – Glow plug coil | Damaged by too high a voltage | Replace with new plug (BERU 194 Grn.). Check if a series resistance is fitted, if not, install a resistance. |
| 18 – Glow plug remains on longer than necessary | Thermo-switch incorrectly adjusted on defective | Adjust thermo-switch (see instructions) or replace. |
| | Shortage of fuel | See point 7. |
| | Shortage of air | See point 6. |

Checking jets

Take adaptor out and clean it.

Separate union from adaptor.

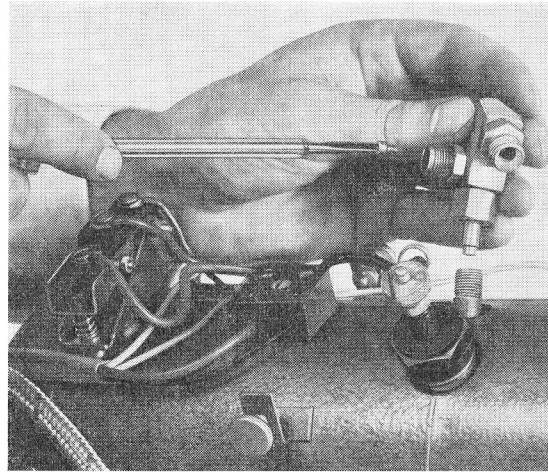
Unscrew **feed jet (0.325 mm)** now visible and clean it with compressed air (do not use wire).

Unscrew union adaptor on the return pipe side.

Take **overflow jet (0.75 mm)** out of adaptor and clean with compressed air (do not use wire).

Screw **metering jet (0.325 mm)** out of the jet carrier and clean it with compressed air (not wire).

Do not interchange jets because the jet sizes control the fuel quantity and ensure clean, soot-free burning.



Checking and adjusting fuel pump

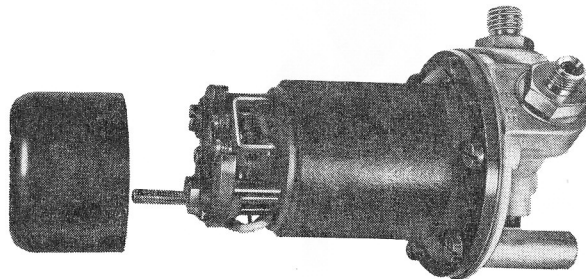
Check contacts and oil bearings and springs **lightly** if necessary.

The pump must be fitted so that the pressure union is vertical. The suction and pressure sides of the pump are shown by the arrows.

The contact breaker gap should be 1 mm. Gap is set with adjusting screw and moving point pressed against housing.

Bleed the fuel system if necessary after installing pump and moisten the leaf of the pressure valve in the union with a few drops of fuel.

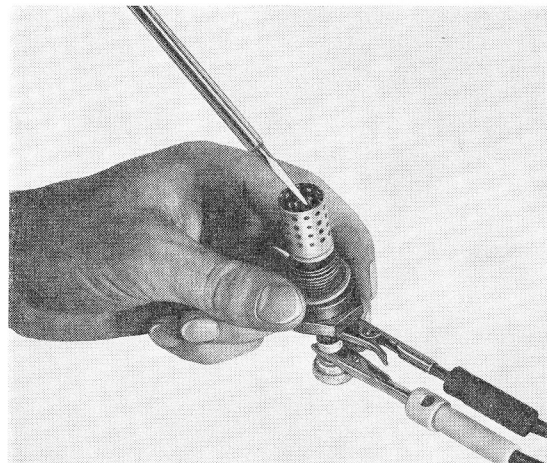
Fit new seals in the union nuts of the suction pipe.



Checking glow plug

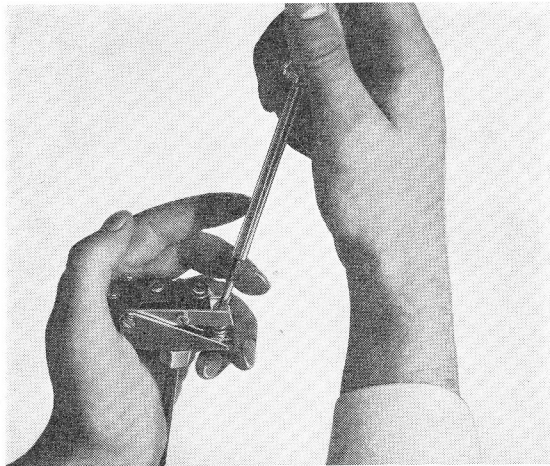
Screw plug out and clean it. If necessary straighten plug coils using a 4 volt current because if bent cold the wire will break.

If a new plug is fitted, use only the correct type.



F 5.3

Checking and Adjusting Parts



Checking and adjusting thermo-switch

The run-on should be 150–200 seconds, otherwise the setting of the thermo-switch must be altered.

If the run-on does not switch off at all, the quartz rod is broken.

Replace quartz rod and adjust thermo-switch

Screw the adjusting screws out of the nut in switch mounting. Take out pressure spring and leaf spring.

Fold adjusting arm and switch back.

Slide quartz rod out of feeler tube.

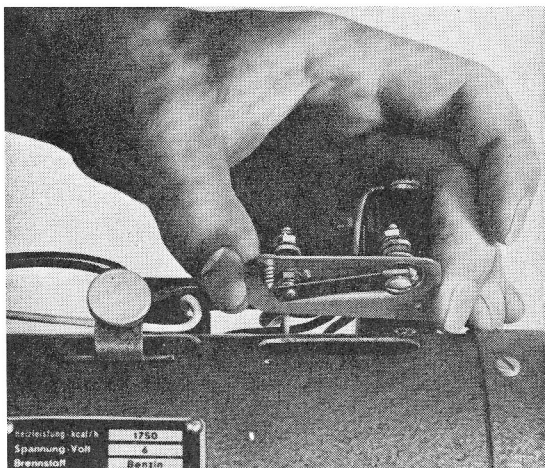
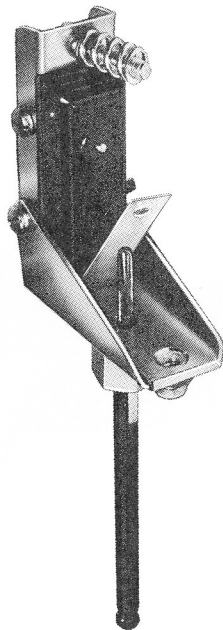
When assembling the switch, ensure that the feeler tube is not bent and that the quartz rod slides easily in the feeler tube.

The adjusting arm must turn freely in the switch mounting.

Turn adjusting screw in until switch operates (audible click), turn back to switching point and then tighten 120° ($\frac{1}{3}$ of a turn) past the switching point.

The final adjustment is made with the heater at operating temperature.

If the run-on is too long, turn screw to right, if too short, turn it to the left.



Overheating switch

The switch contacts must be closed when the heater is operating normally and should interrupt the current to the fuel pump at a temperature of $125\text{--}180^\circ\text{C}$. The switch is set by the manufacturer so do not bend the spring.

Replace the switch if it does not work properly.

Checking the heater

Every time the heater has been dismantled or when parts have been replaced, the heater should be given a trial run to check all the adjustments.

1 – Checking heater when out of vehicle

Set the heater up horizontally as it is installed in the vehicle.

The exhaust gases must not be obstructed in any way and the exhaust pipe must not be extended. Install the air hose on the combustion air intake adaptor.

Connect a fuel pipe of the same length as the original pipe to the filter.

Connect a return fuel pipe, preferably a hose, to the threaded adaptor of the jet carrier. The cross section of this pipe must under no circumstances be smaller than the proper pipe used in the vehicle. It must be routed perfectly straight, without bends or kinks, to a container which collects the fuel overflow. The end of the pipe must not be immersed in the fuel but must be above the fuel level so that there is no back pressure which would cause an increased delivery of fuel and sooty burning.

Connect electrical cables.

The test voltage is 11.6 volts.

Switch heater on.

A 100 cc measuring container with suitable markings should be used for the fuel consumption test. The fuel suction pipe should be placed in a suitable container and also the return pipe, noting the above instructions.

When the ignition period is ended (Thermo-switch switches off the current to the heater plug) the test begins.

The consumption should be 0.22–0.27 liters/hour, or 15 cc in 225–200 seconds.

Note soot formation during the consumption test and then for a further 3 minutes.

Check that the pressure pipe of the fuel pump is vertical to the installation surface. Check all cables and screws for security.

Check the operating point of the safety switch (125–180° C) by partially blocking the air inlet (about $\frac{2}{3}$ of intake opening).

If the heater smokes badly, check the blower speed. It should be 4550–5400 rpm at 12 volts.

The run-on at 12 volts should be 150–200 seconds, otherwise the thermo-switch setting must be rectified.

2 – Checking with heater installed

If the heater is to work properly when installed even though it has been checked thoroughly beforehand it must be installed in accordance with the makers instructions.

Do not alter exhaust pipe and combustion air intake.

Check routing of fuel suction and return pipes.

Prevent poor ground connections (voltage drop) by cleaning paint and rust from ground strap contact surfaces.

F 5.3 Checking and Adjusting Parts

Check wiring with diagram.

Check condition of vehicle battery and charge if necessary.

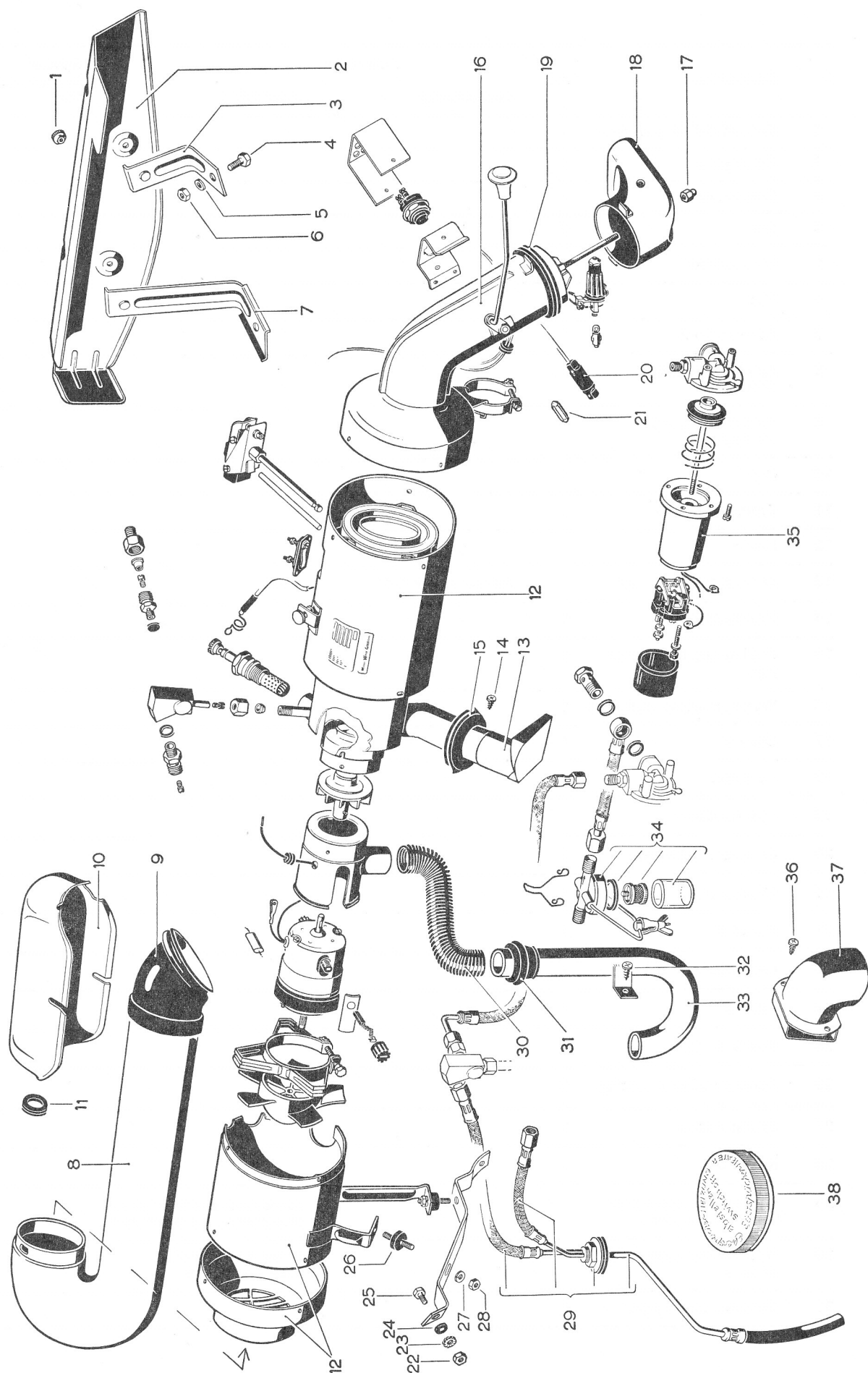
The heater will not work properly when the voltage is below 11 volts.

Switch heater on and check operation of glow plug.

If the battery is discharged, start the engine and put heater into operation again when red charging lamp goes out.

Check heater run-on and rectify thermo-switch setting if necessary.

Heater and Warm Air Duct F 5.4



F 5.4 Heater and Warm Air Duct

| No. | Designation | Qty. | Note when | | Special instructions see |
|-----|---|------|-------------------|--|-----------------------------|
| | | | diassembling | assembling | |
| 1 | Knurled nut for cover plate | 1 | | | |
| 2 | Cover plate | 1 | | | |
| 3 | Bracket, rear | 1 | | | |
| 4 | Nut | 2 | | | |
| 5 | Lock washer | 2 | | | |
| 6 | Nut | 2 | | | |
| 7 | Bracket, front | 1 | | | |
| 8 | Air circulating pipe (front part) | 1 | | | |
| 9 | Air circulating pipe (rear part) | 1 | | | |
| 10 | Cap | 1 | | | |
| 11 | Grommet for cap | 1 | | | |
| 12 | Heater | 1 | | | |
| 13 | Exhaust pipe with cap | 1 | remove screw (14) | clean | |
| 14 | Phillips screw | 1 | | | |
| 15 | Sealing ring for exhaust pipe | 1 | | | |
| 16 | Warm air elbow with flaps | 1 | | | |
| 17 | Cap nut | 1 | | | |
| 18 | Air outlet | 1 | | | |
| 19 | Seal for elbow | 1 | | | |
| 20 | Connector with fuse | 1 | | | |
| 21 | 16 amp. fuse | 1 | | | |
| 22 | Nut M 6 | 1 | | | |
| 23 | Lock washer A 6.4 | 1 | | | |
| 24 | Washer | 1 | | | |
| 25 | Bolt M 6×12 | 1 | | | |
| 26 | Bonded rubber mounting | 2 | | | |
| 27 | Spring washer | 1 | | | |
| 28 | Nut M 6 | 1 | | | |
| 29 | Suction and return lines with tank adaptor | | | hoses must not be routed so that they form a water trap | |
| 30 | Hose for combustion air pipe | 1 | | install firmly on pipe, must not slip off | |
| 31 | Grommet for air pipe | 1 | | | |

| No. | Designation | Qty. | Note when | | Special instructions see |
|-----|-----------------------------|------|--------------------|-------------------|--------------------------|
| | | | when disassembling | assembling | |
| 32 | Tapping screw | | | | |
| 33 | Combustion air pipe | | clean | | |
| 34 | Fuel filter | 1 | clean | install correctly | F 5.5/1-1 |
| 35 | Fuel pump 1 | 1 | | | F 5.5/1-2 |
| 36 | Tapping screw | 2 | | | |
| 37 | Air intake pipe | 1 | | | |
| 38 | Sticker on tank filler flap | | | | |

Removing and installing heater

Take 16 amp. fuse out of the holder.

Take cap nut off air outlet.

Screw warning lamp out of air outlet.

Screw knob off pull rod and loosen screws holding cap.

Disconnect suction line at fuel filter.

Disconnect return line from jet carrier. Use a 14 mm wrench to hold adaptor.

Pull return line out of cap and take cap off.

Remove two nuts from bonded rubber mountings.

Pull hose off combustion air intake and heater.

Take screw out of exhaust pipe. Lift heater out of the seals on the warm air duct and the exhaust pipe.

Installation takes place in the reverse order.

Note:

All holes must be fitted with grommets or seals. Ensure that the exhaust pipe seal is in order and replace it if it shows the slightest sign of damage.

Remove paint and rust from area where the ground strap is attached in order to obtain a good electrical contact.

Route fuel lines carefully. The return line in particular must not be stretched or squeezed and must not hang down.

Suction and return fuel lines

Detach suction line from filter.

Detach return line from jet carrier. Hold union with 14 mm wrench.

Lift luggage compartment floor covering.

Remove nut from tank adaptor and take fuel lines out.

Install in reverse order, ensuring that tank adaptor is properly sealed.

Check tank ventilation.

Filter

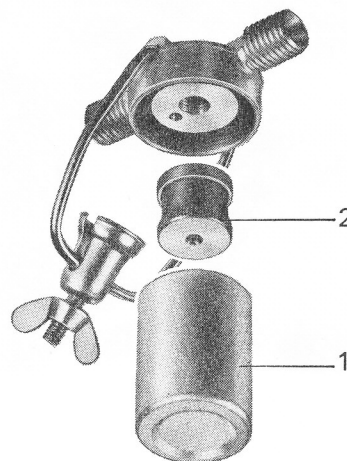
Detach suction lines from tank to pump.

Loosen wing nut. Take filter glass (1) off (must be replaced if it shows the slightest sign of damage).

Screw filter element off and clean element and glass carefully.

Watch flow direction when installing (arrow on housing).

(There is also a strainer mesh in jet carrier.)

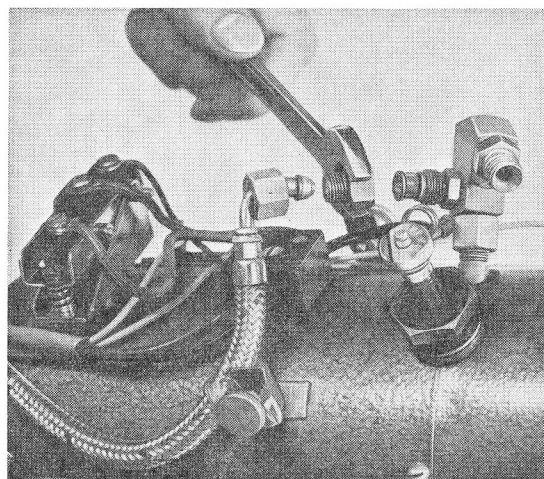


1 – Filter glass (water trap)
2 – Filter element

Jet carrier

Detach supply and return lines. It is essential to hold the adaptor with a 14 mm wrench.

Loosen union nut holding jet carrier on heat exchanger. unscrew adaptor and nut on the feed side.



F 5.5 Removing and Installing Parts

Fuel pump

Removing

- 1 – Disconnect battery ground strap.
- 2 – Disconnect cables from pump and take ground cable off.
- 3 – Remove fuel lines, loosen clip and take pump off.

Installing

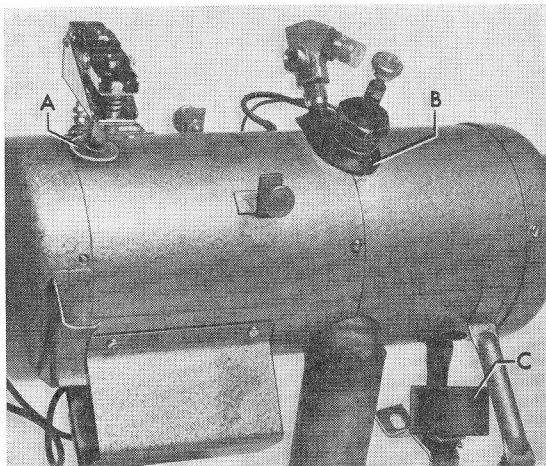
Secure pump with clip so that the arrow on the pressure connection points upwards.



Glow plug

Remove

- 1 – Disconnect battery ground strap.
- 2 – Disconnect cable.
- 3 – Screw plug out.



- A – Seal for thermo-switch
- B – Seal for jet carrier and glow plug
- C – Seal for combustion air intake pipe

Sealing

The holes between thermo-switch, jet carrier, glow plug, combustion air intake pipe and the heater casing were fitted with seals from March 1968 onwards. These seals prevent air from entering the body when the heater is switched off.

Thermo-switch

Removing

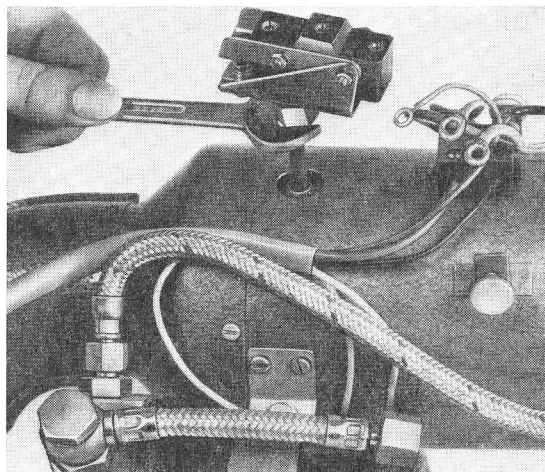
- 1 – Disconnect battery ground straps.
- 2 – Detach cables from terminals NC, NO and C.
- 3 – Loosen union nut under the switch.
- 4 – Pull switch out vertically with a rotating motion, without bending the feeler tube. Use an easing solvent if necessary.

Installing

When installing the switch on the heater, ensure that the retaining nut does not touch the casing as this will affect the operation of the switch.

Use seal A for thermo-switch (see illustration on page F 5.5/1–2).

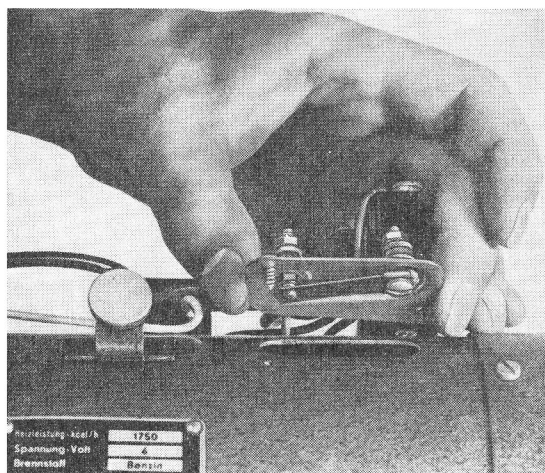
Connect cables as shown in wiring diagram (F 5.1/4–1).



Overheating switch

Removing

- 1 – Disconnect battery ground cable.
- 2 – Disconnect both cables.
- 3 – Remove two tapping screws and take switch off.



Heater switch

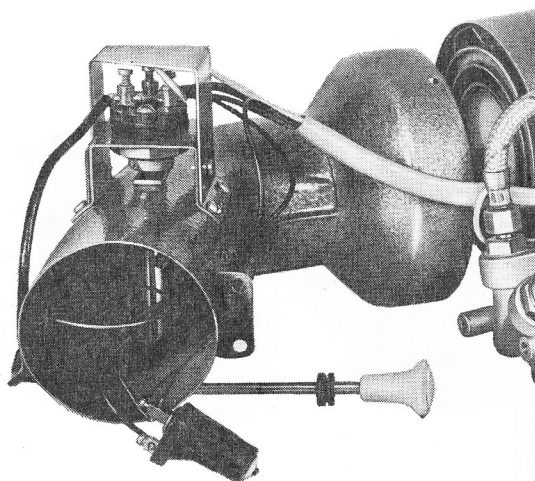
Removing

- 1 – Disconnect battery ground cable.
- 2 – Take cap off switch.
- 3 – Disconnect cables from switch.
- 4 – Take switch bracket off duct.
- 5 – Take switch off bracket.

Installing

Install in reverse order.

Connect as shown in wiring diagram.



F 5.5 Removing and Installing

Pull rod

Screw knob off rod at partition.

Take cotter pin out of rod.

Take rod, washer and spring off lever.

When installing, do not forget the grommet in partition.

Warning lamp

Remove cap nut from outlet.

Remove retaining screw complete with red lens.

Take outlet off complete with lamp.

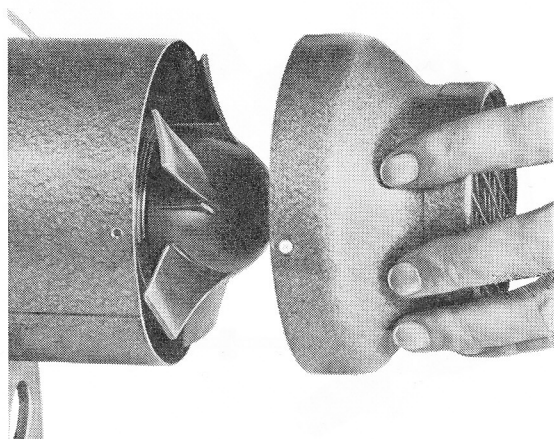
Install in reverse order.

Disassembling heater

Screw glow plug out.

Detach fuel feed line from jet carrier. Hold adaptor with a 14 mm wrench.

Loosen union nut and pull jet carrier out.



Disconnect cables

a – at cable connector

b – at thermo-switch

c – at overheating switch

d – at fuel pump

Remove thermo-switch: Loosen union nut under switch and pull switch out with rotating motion without bending the feeler tube. If necessary, use an easing solution.

Remove overheating switch.

Remove fuel pump after loosening clip and detaching the ground cable.

Take intake cap off.

Remove outlet complete with switch.

Loosen the three screws joining the two halves of casing together.

Take front part of casing off, pulling the blower motor cable through the grommet at the same time.

Lightly loosen the three screws securing the combustion air blower and pull blower out of heat exchanger (design change in March 1968).

When assembling, seal joint between blower and heat exchanger with Teroson-Atmosit.

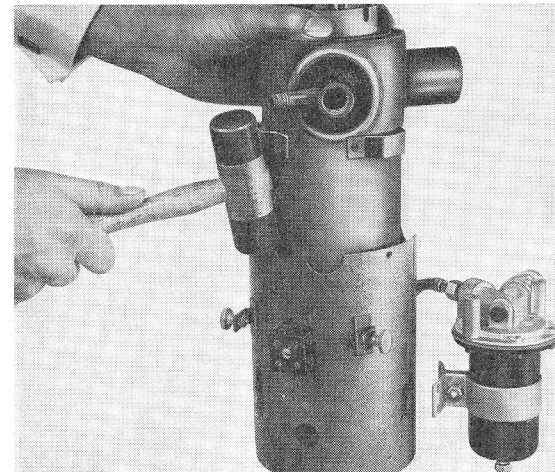
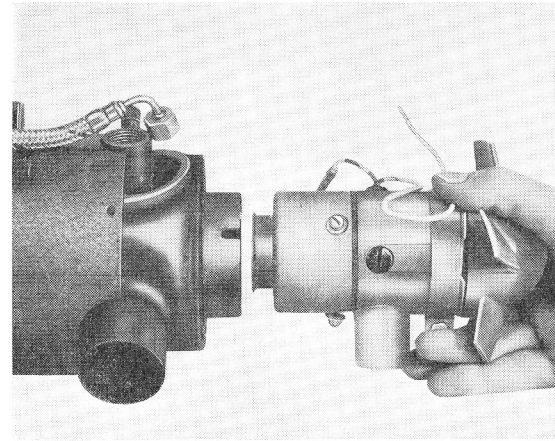
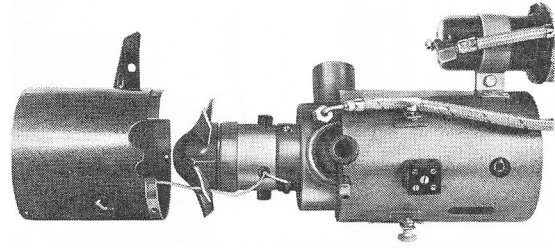
Pull heat exchanger out of rear casing half, taking care not to damage the threaded adaptor for the thermo-switch.

If the heat exchanger is very dirty inside, it can be burned out with a soft welding flame and blown out with compressed air. It is then assembled in the reverse order.

Connect electric cables as shown in wiring diagram.

Note:

From March 1968 the heat exchanger and combustion air blower are held together by a clip (see F 5.7/1-1).



Disassembling combustion air blower

(up to March 1968. From March 1968, see page F 5.7/1-1).

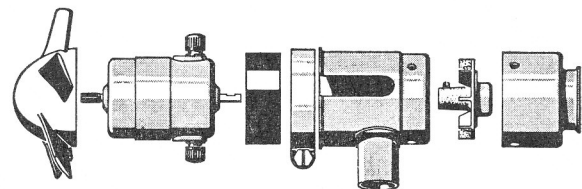
Press axial wheel off motor shaft by screwing a bolt into the hole in the wheel.

Take the vane housing off after loosening the screws and disconnecting the motor ground cable. Check radial wheel for damage and replace if necessary.

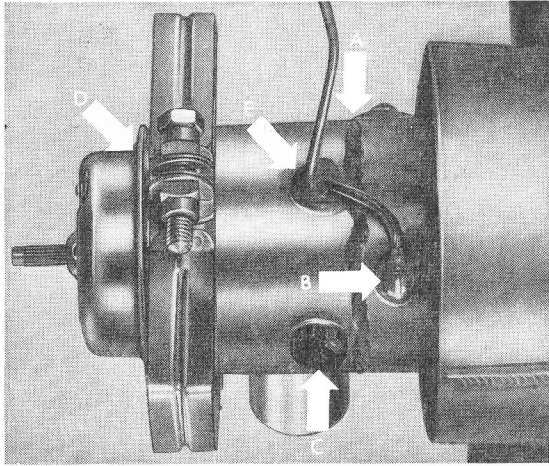
Loosen the set screw and lever radial wheel off with two screwdrivers.

Loosen clip and pull motor locating housing off motor.

Assemble in the reverse order. Ensure that the rubber band used to seal motor and motor locating housing does not extend into the combustion air intake adaptor as this will restrict the area of the air intake part. There must be a gap of 1.5 mm between radial wheel and motor locating housing.



F 5.5 Removing and Installing Parts



Note:

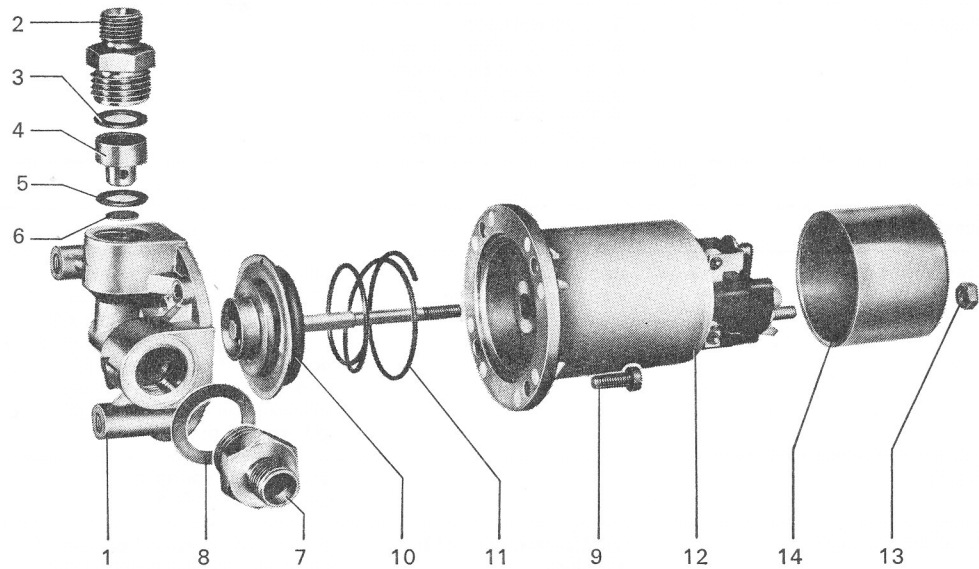
The joint between combustion air blower and heat exchanger (arrow A) and the screws (arrow B) are sealed with VW Sealing Compound D 3 instead of with Teroson-Atmosit.

In addition, the carbon brush caps (arrow C) the motor seals (arrow D) and the cable grommet (arrow E) are also sealed with sealing compound. This prevents leaks at these points allowing warm air to get into the combustion chamber and interfering with combustion.

When repairing the combustion air blower and on all old heaters, the points shown in the illustration must be sealed carefully with D 2 sealing compound. The existing Teroson-Atmosit compound must be removed beforehand and the areas to be sealed cleaned thoroughly.

Disassembling and Assembling Fuel Pump **F 5.6**

Fuel pump

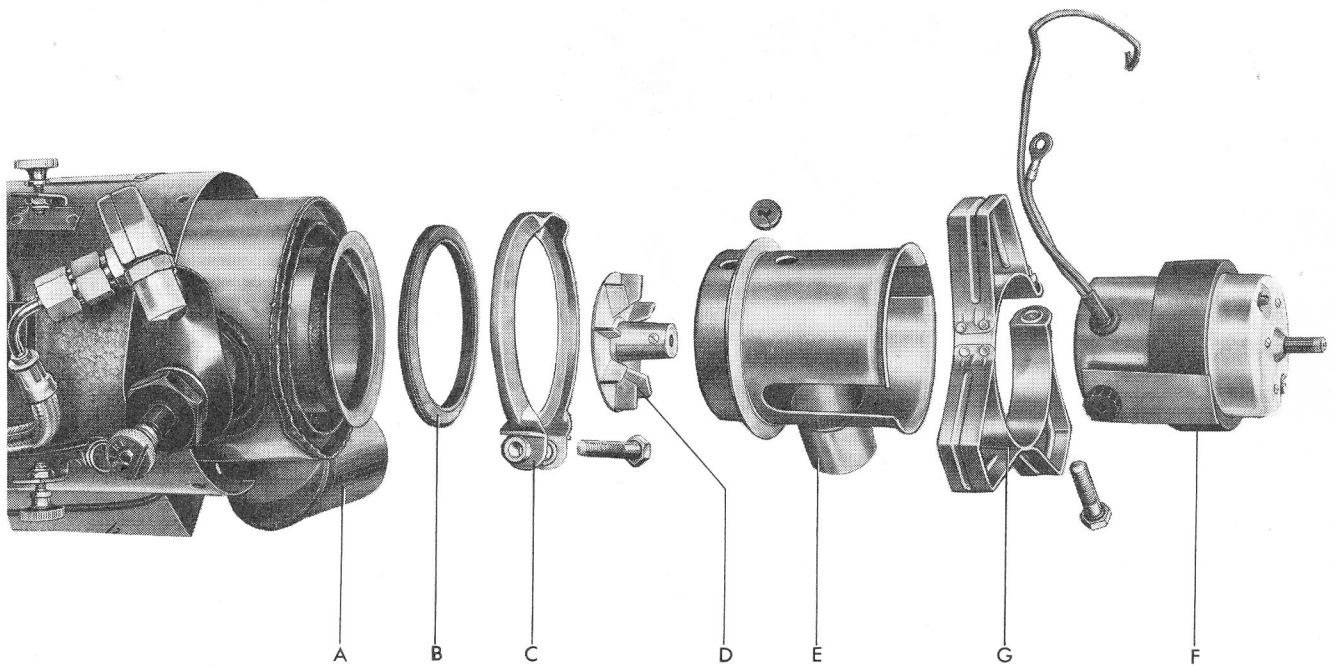


| No. | Designation | Qty. | Note when | | Special instructions see |
|-----|------------------------------|------|--|--|--------------------------|
| | | | disassembling | assembling | |
| 1 | Pump body | 1 | | pump must be installed in vehicle with pressure union at top (arrow points outward) | |
| 2 | Outlet union (pressure side) | 1 | 12 mm wrench; look for damage; spherical surface must be smooth; outlet union has smaller drilling and is smaller across flats than intake union | if pump rattles, unscrew union nut and moisten outlet union with fuel; when assembling, ensure that intake union and outlet union are not mistaken | |
| 3 | Washer | 1 | | | |
| 4 | Pressure valve | 1 | make sure valve is not dirty | | |
| 5 | Washer | 1 | | | |
| 6 | Suction valve | 1 | if pump rattles, and moistening with fuel does not remedy it, suction valve is tilted and jammed | ensure that suction valve is in correct position | |

F 5.6 Disassembling and Assembling Fuel Pump

| No. | Designation | Qty. | Note when | | Special instructions see |
|-----|-----------------|------|---|---|-----------------------------|
| | | | disassembling | assembling | |
| 7 | Intake union | 1 | 17 mm wrench; look for damage; spherical surface must be smooth; intake union has larger drilling and is larger across flats than outlet union | | |
| 8 | Seal | 1 | | | |
| 9 | Screw | 4 | | | |
| 10 | Diaphragm unit | 1 | unscrew counter-clockwise | delivery quantity adjustment: screw diaphragm unit in as far as possible, then back off 2 ¹ / ₂ turns; the diaphragm also acts as seal between pump and winding housing, there- fore ensure that diaphragm is correctly positioned | |
| 11 | Spring | 1 | | ensure that spring is correctly installed | |
| 12 | Winding housing | 1 | vent hole must not be blocked | pump and winding housings are screwed together so that vent hole is opposite pressure union | |
| 13 | Nut | 2 | | | |
| 14 | Bakelite cap | 1 | | | |

Disassembling and Assembling Heater **F 5.7**



| Part | Designation | Qty. | Note when | | Special instructions see |
|------|------------------------|------|--------------------------|------------|--------------------------|
| | | | disassembling | assembling | |
| A | Heat exchanger | 1 | clean | | F 5.5/1-5 |
| B | Seal | 1 | | | |
| C | Clip | 1 | | | |
| D | Radial wheel | 1 | replace if damaged | | |
| E | Motor locating housing | 1 | | | |
| F | Motor | 1 | press off with 4 mm bolt | | F 5.5/1-5 |
| G | Clamp for motor | 1 | | | |