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SUBSEQUENT INSTALLATION OF WINDSHIELD WIPER ASSEMBLY

From

Coupe identification-No. 101 693
Cabriolet identification-No. 150 001
Hardtop identification-No. 200 001

the windshield wiper assembly 644.628.017.12 for the above mentioned types can be installed subsequently.

The windshield wiper assembly may be installed in same sequence as described in group L of the Supplement to the Workshop Manual 356 B.

Attention should be paid to the following points:

1. To facilitate removal and installation the glove box has to be removed.
2. Install push-pull rheostat switch No. 644.613.511.00, as illustrated in Fig. 1.
3. Reposition wires as appropriate, see page SL 3
Wire cross-section should be at least 1.5 sq. mm (.0023 sq. in.). Wires should be connected according to wiring diagramm page SL 3
4. Enlarge wiper arm openings in the body to 18,2mm (.717 in.). dia.

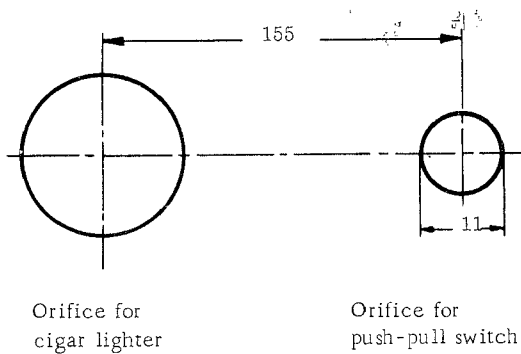


Fig. 1

When installing the windshield wiper assembly in automobiles with right-hand drive, attention should be paid to the following points:

1. The connecting rod of the windshield wiper must in the end position be turned 180°, as opposed to the left-hand drive automobiles, namely pointing to the left.
2. Mount the removable joint bar on the right-hand side.

The end position of the wiper blades is on the right.

DESCRIPTION of the LOUDSPEAKER INSTALLATION in VEHICLES TYPE 356A and 356B

From	Coupe Chassis - No. 117 601
	Cabrio " " 155 601
	Hardtop " " 201 601
	Roadster " " 89 601

a modified loudspeaker system will be installed. Figures 1 and 2 show the difference in the exterior appearance of the systems. The tone of the new loudspeaker has been improved.

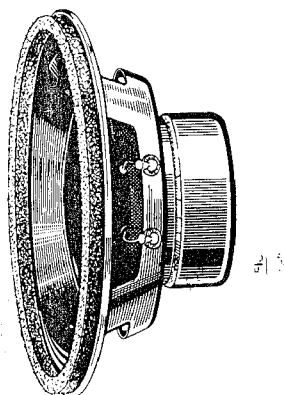


Fig. 1

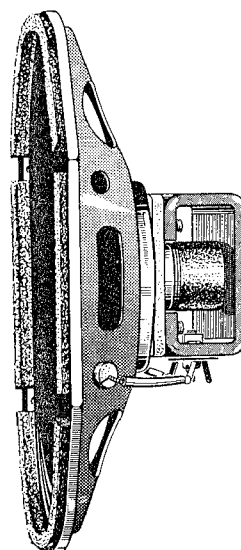


Fig. 2

The following parts are required for installation:

New loudspeaker system		Old loudspeaker system	
2 Loudspeakers	644. 645. 504. 00	2 Loudspeakers	644. 645. 501. 00
2 Retaining rings	644. 645. 515. 00	2 Grilles	644. 645. 511. 00
2 Decorative frames	644. 645. 513. 01	2 Decorative frames	644. 645. 513. 00
2 Grilles	644. 645. 511. 01	8 Cheese head screws	M 4x10 DIN 84
8 Fixing angles	644. 645. 517. 00	8 Washers	4, 3 DIN 125
8 Cheese head tapping screws	B 3,5x22 DIN 7971	8 Spring washers	A 4 DIN 137

INSTALLATION

1. Solder the cables supplied to the two loudspeakers. The cable ends must not touch the loudspeaker case. With "Becker" radio models the cables have to be extended. Cable diameter 0,75 mm².
2. Cut out the lining covering the loudspeaker cups on the right and left sidewall. Determine their position by going over the lining with the hand.
3. Find the holes for the fixing screws of the loudspeaker in the same way. Cut out the lining covering the holes.

Pay attention not to damage the membrane.

Description of the BN-4 Ventilating Combustion Heater

General

The BN-4 ventilating combustion heater, Test Code S-036, is manufactured by the Eberspächer Company of Esslingen, Germany.

The heater is a special order item. It can be installed in the space behind the spare tire in the front compartment of the below listed types of cars commencing with serial numbers as follows:

Coupe,	from Chassis Serial No. 117 601
Convertible,	from Chassis Serial No. 155 601
Hardtop,	from Chassis Serial No. 201 601

The BN-4 heater is a self-contained heat generating unit operating independently of the car's combustion engine and, consequently, will produce heat regardless whether the car is in motion or the engine running. However, when using the heater with the car parked, battery charge level should be taken into consideration since the battery supplies the electrical energy for the heater.

The operating voltage is 6 Volts DC and power draw is approx. 50 Watts, meaning that the drain on the battery equals $\frac{50}{6} = 8.4$ Ah. Correspondingly, when using a battery with a capacity of 84 Ah, and assuming that the battery is only half-charged, the heater will operate with the car at standstill for only $\frac{42}{8.4} = 5$ hours, at which time the battery would be fully discharged.

The BN-4 heater is standard equipment on Type 356 B/2000 GS (Carrera 2) cars. The operating voltage of heaters supplied for these cars is 12 Volts.

Technical Data

Heat output	<u>progressively variable</u>	from 1080 to 4000	kcal/h
Ventilating air flow	approx.	150	kg/h
Fuel			carburetor fuel
Fuel consumption	min.	0.2	l/h
	max.	0.65	l/h
Power draw		50	Watts
Operating voltage		6	Volts DC
Weight	approx.	11	kg
Warm air temperature		40 to 100	°C
	<u>progressively variable</u>		

as shown in heat output diagram on page S TRA 6

Heat Output Diagram

Heat output diagram for Type BN-4 ventilating heater (1 kcal = 3.96 BTU)

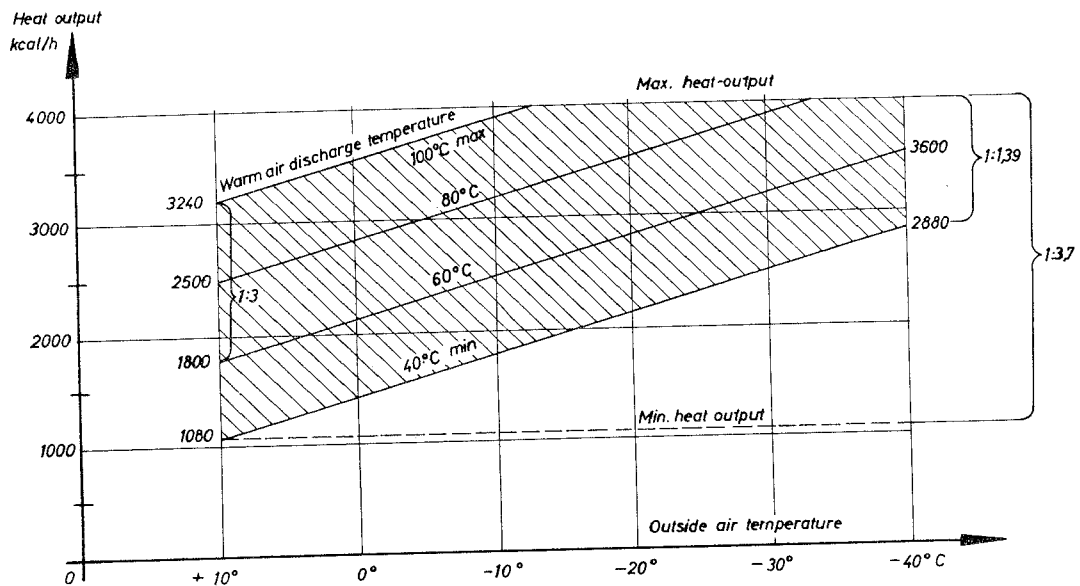


Fig 1

Explanatory notes to the heat output diagram

The above heat output diagram shows the temperatures of outside air prior to heating, from $+10^{\circ}\text{C}$ to -40°C (X-coordinate), and the rate of heat output up to 4000 kcal/h (Y-coordinate). The diagonal lines in the diagram represent values of constant discharge air temperature from 40°C to 100°C . As may be seen, the diagram shows a limit of maximum heat output of 4000 kcal at the top of the diagram. The minimum heat output is 1080 kcal with a discharge air temperature of 40°C at an outside air temperature of $+10^{\circ}\text{C}$. Accordingly, this represents a maximum variability ranging from 1080 to 4000 kcal, or a ratio of 1:3.7. Variability range at -40°C is 1:1.39, i.e., 2880 to 4000 kcal. The indicated discharge air temperatures apply only to readings obtained at the heater since a temperature drop occurs during the transfer of the heated air to the car's interior.

Fresh air flowing at the rate of 150 kg/h, at an outside temperature of $+10^{\circ}\text{C}$, will receive a maximum of only 3240 kcal because a top limit of 100°C is set for the heated air discharge temperature. The maximum transfer of heat to ventilating air occurs at an outside temperature of -11°C . The heat output of 4000 kcal remains constant at lower outside air temperatures, and decreases to 3240 kcal at higher outside air temperatures of between -11°C and $+10^{\circ}\text{C}$. At 0°C outside air temperature the heat output is 3600 kcal with a heated air temperature of 100°C . The decrease in generation of heat at rising outside air temperatures is of an advantage inasmuch that less energy is required to heat warmer outside air.

The diagram is based on an air flow of approximately 150 kg/h, a maximum temperature differential of 110°C , and a maximum heat output of 4000 kcal/h, with warm air discharge temperature variability ranging from 40°C to 100°C .

Cross-Sectional View of the BN-4 Heater

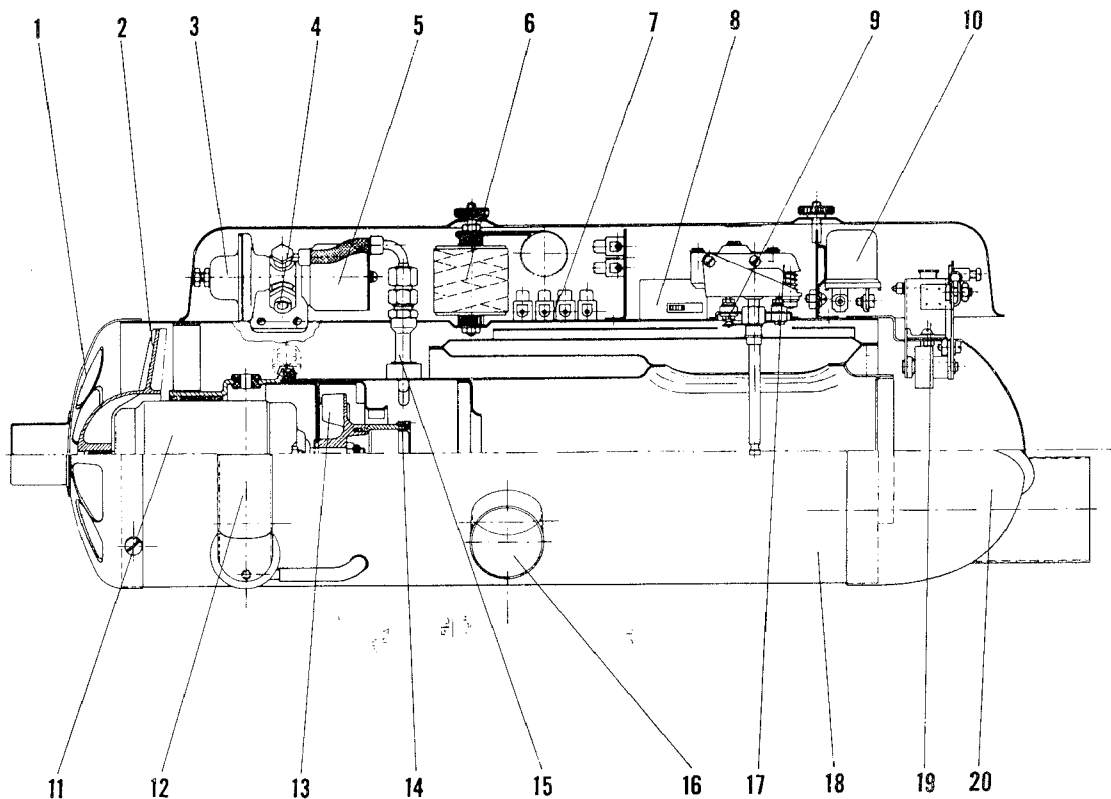


Fig. 2

- | | |
|---------------------------|-----------------------------------|
| 1. Ventilating air intake | 11. Blower motor |
| 2. Ventilating air blower | 12. Combustion air intake |
| 3. Pressure regulator | 13. Combustion air blower |
| 4. Fuel line connector | 14. Diffuser |
| 5. Fuel solenoid | 15. Nozzle |
| 6. Ignition coil | 16. Exhaust duct |
| 7. Junction block | 17. Thermoswitch with heat sensor |
| 8. Safety switch | 18. Outside shell |
| 9. Overheat switch | 19. Heat control switch |
| 10. Relay switch | 20. Warm air distributor |

Heat system components

The heat exchanger is enclosed by a cylindrical jacket of 150 mm diameter, and consisting of a central cylinder with a concentric annular area. Located in the front end of the heat exchanger is the combustion chamber and an electric motor with blower fans for combustion and ventilating air. A sheetmetal shell encases the heater assembly. Mounted on the shell is a pressure regulator with a fuel solenoid valve. The fuel flows from the electric fuel pump to the pressure regulator and the fuel solenoid, then to a nozzle which is located in a vertically positioned tube.

Upper lever (for ventilator and temperature control)

Position 4: Ventilator and heater turned off.

Position 5: Ventilator blowing fresh air into car's interior (for ventilation at slow speeds or when parking).
The lower lever must be anywhere between Position 2 and 3.

Position 6: Heater turned on. By moving the lever anywhere between Position 6 and 7, the required temperature setting is made for temperatures ranging from approx. 40° C to approx. 80° C.

The lower lever controls the flow of air to the defrosters or the floor area, or to both.

Lower lever

Position 1: With lever fully to the right, the flow of air is completely shut off. The heater will not operate when the lever is in this position.

Position 2: Warm air is directed to the defrosters.

Position 3: Warm air is directed to the floor area.

By moving the lever anywhere between Position 2 and 3, an appropriate distribution of air to both, the defrosters and the floor area is effected.

By moving the upper lever to Position 6, all appropriate heater components are put into operation, as follows:

The motor driving the blowers for combustion and ventilating air receives current. The coil is energized. The glow plug receives current through the thermoswitch. The electric fuel pump and fuel solenoid receive current. Thus, all electric components of the heater are provided with current and the heater begins to operate. The combustion air blower forces air into the combustion chamber. The electric fuel pump forces fuel through the pressure regulator and fuel solenoid to the nozzle which sprays the fuel onto the rotating diffuser. The atomized mixture combines with combustion air in the combustion chamber and is ignited by the spark plug, or the glow plug. The flame spreads and combustion gases flow through the combustion chamber and the heat exchanger. The ventilating air blower draws air through the louvered vent below the windshield and forces the air to pass along the jacket of the heat exchanger, causing the air to heat up in the process.

It should be noted that the spark plug operates continuously since the breaker points are actuated by the blower motor.

To maintain the pre-set temperature, the heater has to work intermittently, that is, when the warm air which leaves the heater reaches the pre-set temperature, the fuel solenoid is closed and the generation of heat discontinued. The fuel solenoid is governed by the heat control switch which operates in accordance with settings made or heat required.

To ensure a maximum safety of operation, the heater has been equipped with the following safety devices:

1. Overheat switch

This switch controls the flow of current to the fuel solenoid. If the temperature in the heater should rise to a predetermined maximum, the overheat switch will shut off the fuel.

2. Thermoswitch (purge switch)

When the heater is turned off, the thermoswitch allows the blower motor to run for a short period of time to facilitate cooling and purging the heat exchanger. The thermoswitch also controls the flow of current to the glow plug and safety switch at the initial engagement of the heater.

3. Safety switch

The safety switch comes into action when, for instance, the heater should fail to ignite or warm up, in which instance the safety switch shuts off the flow of current to the fuel solenoid and, thus, interrupts the flow of fuel to the combustion chamber.

Subsequent Installation of the BN-4 Heater

General:

The BN-4 heater may be subsequently installed into all cars commencing with the following chassis serial numbers:

Coupe	Chassis Serial No. 117 601
Convertible	Chassis Serial No. 155 601
Hardtop	Chassis Serial No. 201 601

Parts needed for installation of the heater in 6 Volt systems are available under Part No. 644,572,001,06, for 12 Volt systems under Part No. 644,572,002,02. The installation kits consist of the following parts:

- 1 each Control unit for heating and ventilation, complete
- 1 each Heating and ventilation unit
- 1 each Fuel pump
- 1 each Fuel line with "T" joint
- 1 each Fuel hose, fuel cock to fuel pump A 6x240 SN 710
- 1 each Hose strap 140 SN 907
- 1 each Holding clamp
- 2 each Rubber support for fastening heating unit
- 1 each Rubber support for fastening exhaust duct
- 3 each Hexagon bolt M 6x8 DIN 933-8G gal Zn 9
- 3 each Hexagon nut M 6 DIN 934-6S gal Zn 9
- 6 each Spring washer B 6 DIN 137
- 1 each Sealing plate
- 1 each Sealing rubber
- 1 each Felt strip
- 1 each Clamp
- 1 each Support for heating and ventilation unit
- 2 each Tapping screw, hexagon head, galvanized BZ 4,8x13 DIN 7976
- 2 each Washer, galvanized A 5,3 DIN 9021-St
- 2 each Mecano speed nut SNU-0537-B
- 1 each Warm air hose, 1500 mm long
- 1 each Warm air hose, 1400 mm long
- 2 each Contact relay
- 1 each Relay support
- 1 each Cheese-head screw, galvanized AM 5x20 DIN 84-5S
- 3 each Spring washer A 5 DIN 137
- 2 each Hexagon nut, M 5 DIN 934-6S gal Zn 9
- 1 each Cable set for heating unit

The following work must be performed to install the heater:

1. Remove both floor boards.
2. Withdraw rubber seal for battery cable located in conduit tube accessible from the front compartment; the seal is embedded in the tube for about 1 cm.
3. Working from the front compartment side, insert cable strand for heater into the battery cable conduit tube and guide it into the car's interior. Make certain that the undivided cable strand end (with 5 cable terminals) is inserted. To simplify the insertion of the cable, join the loose five ends with adhesive tape. The cable strand should be guided alongside the battery cable, through the rectangular opening on right tunnel side up to the tunnel middle, then to the forward part of the tunnel parallel to the cable strand which leads to the fuse box, up to behind the instrument panel. The red cable end is to be guided through the transverse panel of the front compartment, along the cable strand up to the fuse box, and fastened to No. 3 terminal in the fuse box. The black cable end (snap-on connector) is to be connected with No. 54 terminal at the ignition/starter switch.
4. Disconnect Bowden cables at both fresh air ducts. Remove clock and ventilation controls.
5. Install new heater and ventilation controls taking care not to bend the Bowden cables. Located about 25 mm below the cable strand passage in the transverse panel of the front compartment, and covered with sound-proofing material, is an opening for the heater Bowden control cable. Punch a hole through the material and guide the cable through it. Connect the three remaining cable ends of the cable strand to like colored terminals in the heater control unit. Reinstall clock. Attach and adjust Bowden cables to fresh air ducts as outlined on page SB 11.
6. Remove the three sheetmetal covers in the front compartment by gently tapping with a hammer from the axle tube side (one cover is for access to the fuel pump, the other two for exhaust and intake ducts).

7. Drill three holes for mounting the relay support (see Fig. 4 and 5). Mount support so that the angular end faces up. Mount both relay switches so that the terminal side points to left (driver's side).

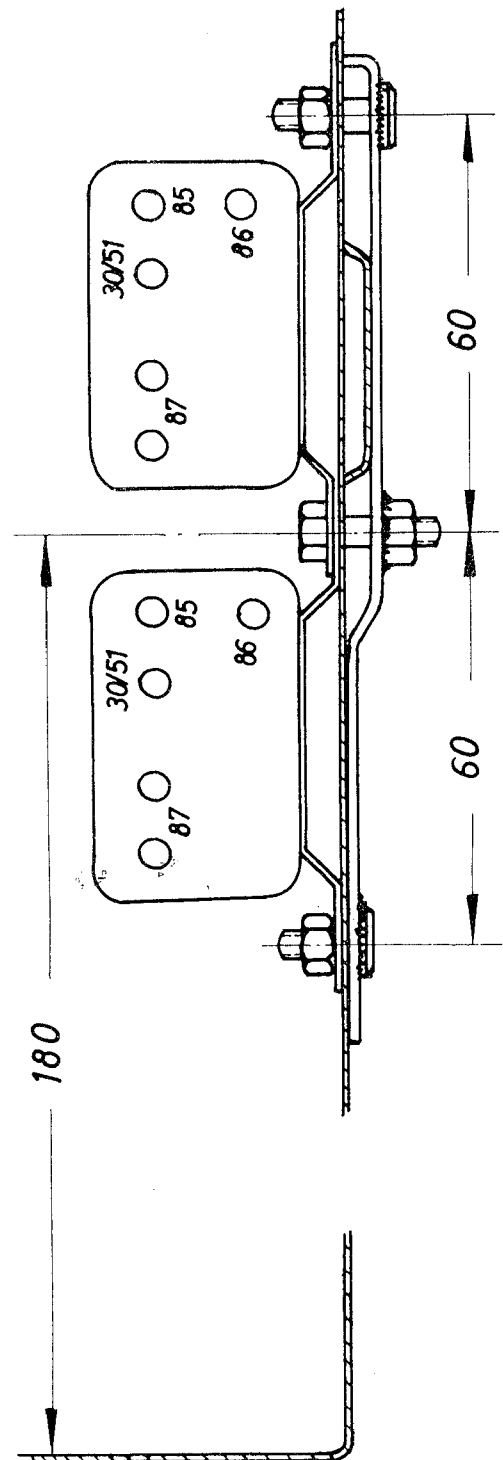


Fig. 4

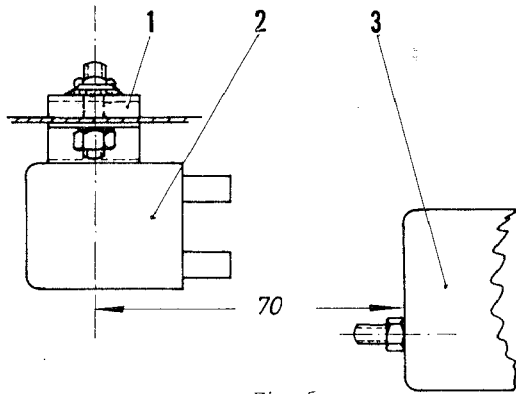


Fig. 5

- 1 Relay support
- 2 Relay switch
- 3 Electric fuel pump

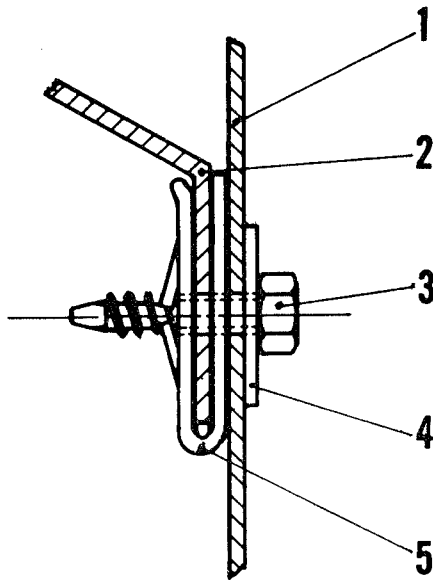


Fig. 6

8. Remove both plastic plugs from the front compartment transverse panel and fasten the angular heater support with both speed nuts; place bolts and washers from outside (see Fig. 6 and 7).

- 1 Front compartment transverse panel
- 2 Heater support
- 3 Tapping screw
- 4 Washer
- 5 Speed nut

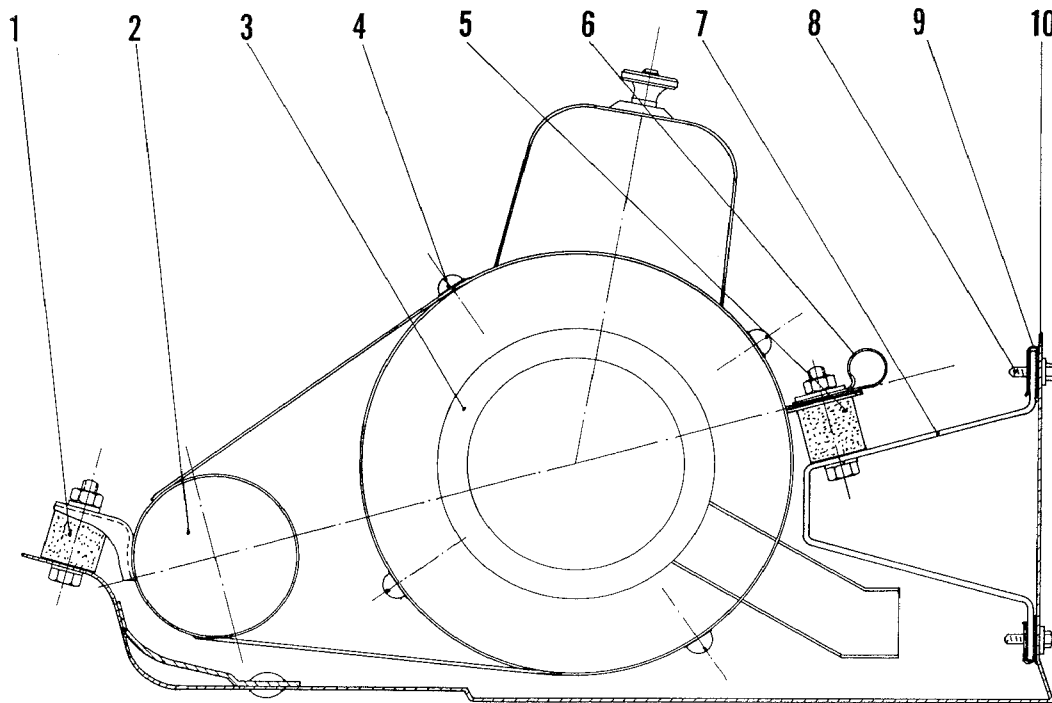
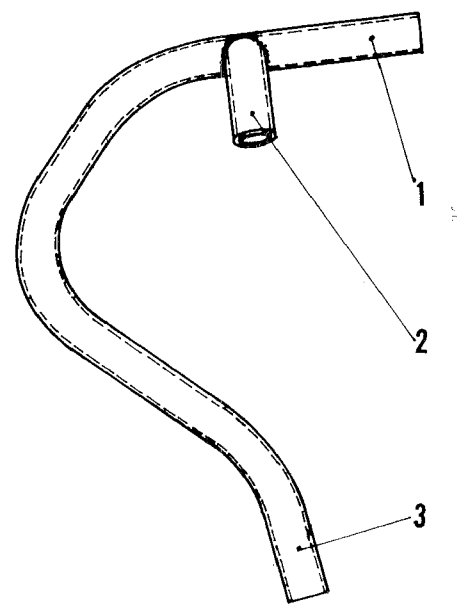


Fig. 7

- 1 Rubber support
- 2 Warm air distributor
- 3 Heater
- 4 Distributor retaining screw
- 5 Rubber support

- 6 Holding clamp
- 7 Heater support
- 8 Tapping screw
- 9 Speed nut
- 10 Front compartment transverse panel

9. Remove the 6 mm plastic plug from spare tire recess. Install rubber support by placing the M 6x8 bolt from underneath.
10. Mount the other rubber support at the rectangular opening in the angular support. Altogether, three rubber supports are required for mounting - 1 for the exhaust duct and 2 for the heater; the shorter rubber support is for the exhaust duct.
11. Apply some talc powder to the rubber mount at the left wheel skirt. Make certain that the exhaust and intake ducts are properly centered in the openings provided in the body, horizontally as well as vertically. The horizontal adjustment (for height) may be made by loosening the four screws (slotted) which secure the warm air distributor.
12. Replace fuel line from fuel cock (Part No. 644.201.921.00) with fuel line with "T" joint (Part No. 644.201.095.00) which is included in the heater kit.



- 1 To electric fuel pump for heater
- 2 From fuel cock
- 3 To mechanical fuel pump at engine

Fig. 8

13. Insert sealing rubber and plate at the heater fuel pump inlet, fasten fuel line connector with coupling nut at fuel pump inlet so that the bent end points upward. Slide fuel hose (24 cm long) onto the fuel line connector; slide other end of hose onto the free connector of fuel line described in Point 12. Fasten fuel pump to support bracket with clamp. Remember to insert felt pad between support bracket and fuel pump. Secure fuel hose to bracket on bottom side of fuel tank with hose strap.
- Note: Inlet and outlet connectors on heater fuel pump are marked with arrows.

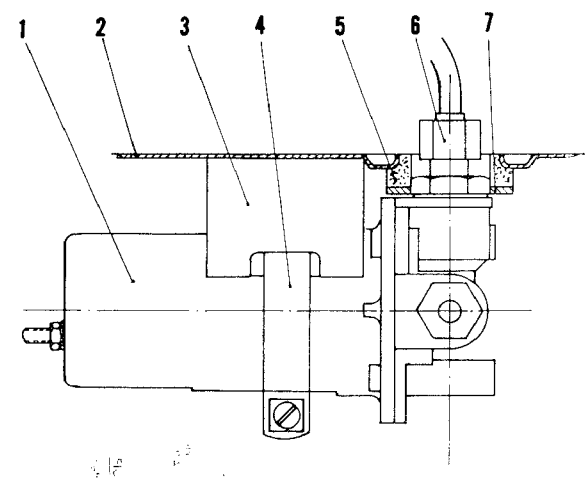


Fig. 9

- 1 Electric fuel pump
- 2 Front compartment panel
- 3 Support bracket
- 4 Clamp
- 5 Sealing rubber
- 6 Coupling nut
- 7 Sealing plate

14. Secure fuel line between fuel pump and heater. The long fuel line is mounted between pump and filter, the short between filter and heater. The filter and fuel line are mounted at the right rubber support at the heater (see Fig. 10).

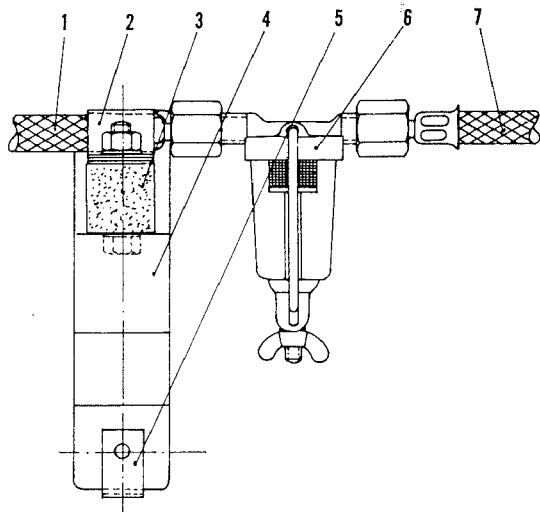


Fig. 10

- 1 Fuel line from fuel pump
- 2 Clamp
- 3 Rubber support
- 4 Heater support
- 5 Speed nut
- 6 Fuel filter
- 7 Fuel line to fuel solenoid

16. Remove stabilizing bar bushing covers, move stabilizing bar down. Fasten the short rubber support at the bottom of the exhaust duct. Insert the exhaust duct into the exhaust tube in heater. Fasten rubber support to the diagonal chassis member through hole provided, making certain that the exhaust duct does not block the parking brake lever shaft. Drill a 3.2 mm hole, from the bottom, in the exhaust duct (see Fig. 12), and screw in a 4 mm sheetmetal screw to keep the duct from loosening turning. Reinstall stabilizing bar.

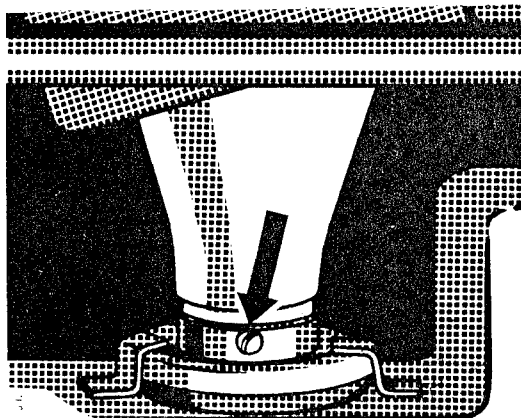


Fig. 12

15. Fasten exhaust and intake ducts. Insert intake duct and rubber seal into sheetmetal sleeve (see sketch) until the seal comes to rest against the compartment panel; the exhaust duct opening must point upward. Secure duct by bending sheetmetal ears on body (see sketch). A plastic ring is utilized on the exhaust duct. The metal ring is also slid on from the outside, and the sheetmetal ears are bent to secure the unit.

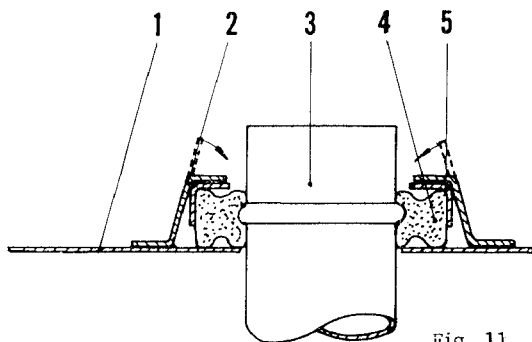


Fig. 11

- 1 Compartment panel
- 2 Sheetmetal ear
- 3 Intake duct
- 4 Rubber seal
- 5 Sheetmetal sleeve

17. Following the wiring diagram, connect cable terminals to the fuel pump, relay switches, and heater. The upper relay switch is designated No. 2, the lower switch is No. 1. Both relay switches are identical. See Fig. 13 for relay switch terminals. Wiring diagram applicable to the heater is shown on page S TRA 17.

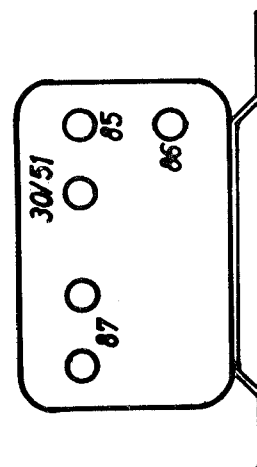


Fig. 13

18. Connect heater Bowden control cable. The cable should be placed underneath the front compartment mat and secured with a clamp utilizing a fuel tank securing bolt, then guided through a rubber grommet in the forward transverse panel of the front compartment to the heater unit (see Fig. 14).
- Caution: Do not bend the Bowden cable. Fasten cable conduit tube securely with the clamp.

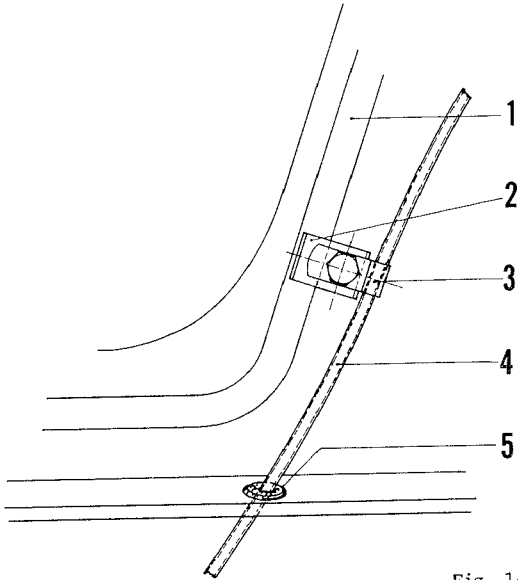


Fig. 14

- 1 Fuel tank
- 2 Fuel tank bracket
- 3 Clamp
- 4 Bowden cable
- 5 Grommet

19. Move heater control lever in control assembly to Position 4 (see Fig. 15). Move control lever on heater control switch to the "AUS" ("OFF") position and fasten Bowden cable to the arm with the terminal screw (see Fig. 16).

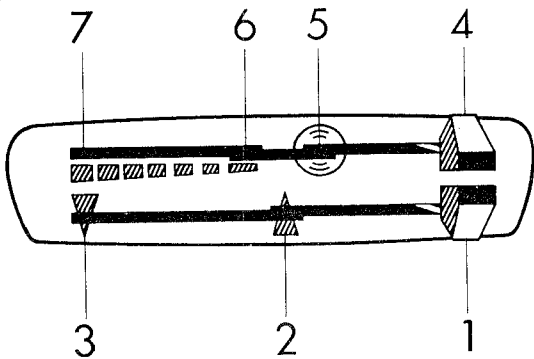


Fig. 15

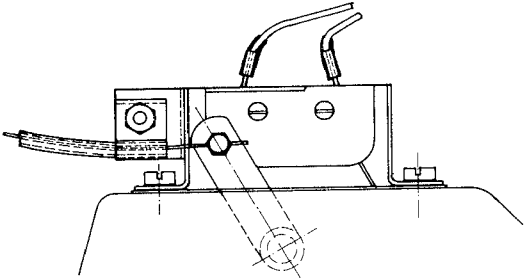


Fig. 16

- 20. Remove screens from fresh air ducts and install warm air hose, by placing it under the compartment mat, between the heater and the ducts, shorten if necessary.
- 21. Remove sponge rubber stoppers from the floor air vents.
- 22. Check heater and ventilator for proper operation.
- 23. Check fuel connections for leaks.
- 24. Reinstall floor boards.
- 25. Reinstall rubber seal in battery cable conduit tube (see Point 2).
- 26. Install heater cover.

Wiring Diagram for the BN-4 Heater

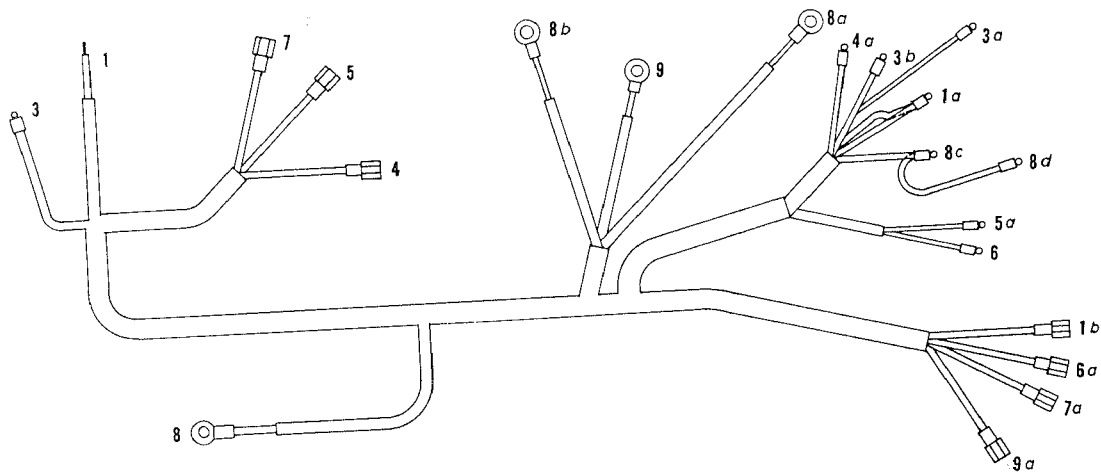


Fig. 17

No.	Color	Connecting Terminal
1	red	Fuse No. 3
1 a	red	Relay switch No. 1, terminal 30/51
1 b	red	Heater, terminal 2
3	black	Ignition/starter switch, terminal 54
3 a	black	Relay switch No. 2, terminal 85
3 b	black	Relay switch No. 1, terminal 85
4	red/white	Control unit
4 a	red/white	Relay switch No. 1, terminal 87
5	blue/white	Control unit
5 a	blue/white	Relay switch No. 2, terminal 30/51
6	blue	Relay switch No. 2, terminal 87
6 a	blue	Heater, terminal 1
7	green/white	Control unit
7 a	green/white	Heater, terminal 4
8	brown	Ground, at chassis
8 a	brown	Ground, at heater
8 b	brown	Ground, at fuel pump
8 c	brown	Ground, at relay switch No. 1, terminal 86
8 d	brown	Ground, at relay switch No. 2, terminal 86
9	green	Fuel pump
9 a	green	Heater, terminal 3

INSTALLATION OF SAFETY BELTS

As of serial Nos.

Coupe 120 620

210 931

Cabriolet 156 850

anchorages for the mounting of safety belts are standard equipment.

Location of the anchorage points and mounting of the necessary parts:

Provision for the anchorage of the different types of belts (air-line type, diagonal shoulder type and diagonal-plus-lap type) has been made at the following points:

a) Air-line safety belts

The spare part No. of the air-line safety belt supplied by us is: 644.803.011.01.

The following anchorage parts are necessary:

2 Shackles	644.803.111.02
4 Spring washers B8 DIN 137 bost.	900.028.010.01
8 Hexagon nuts M 8x1 DIN 934-6S gal Zn 9	900.076.014.02

The anchorage points are located behind the front seats between the floor and the vertical sheeting. The measures of the points for the fastening of the shackles and/or bolts are shown in the figure below.

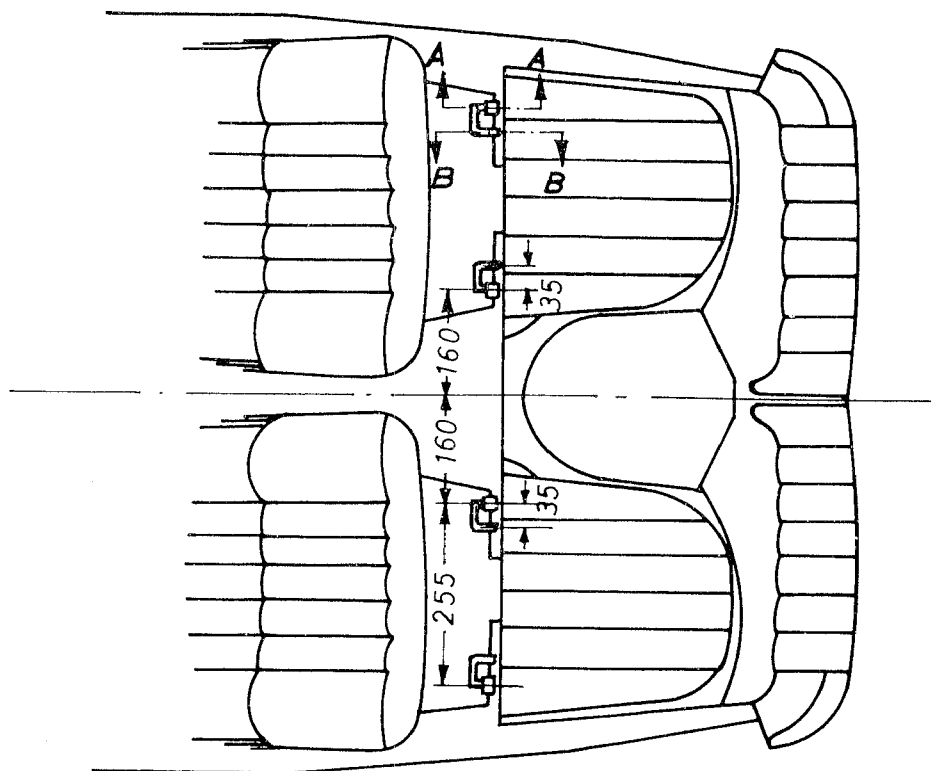


Fig. 1

Mounting anchorage parts

Remove locking screw in A-A and plug in B-B from the vehicle underside

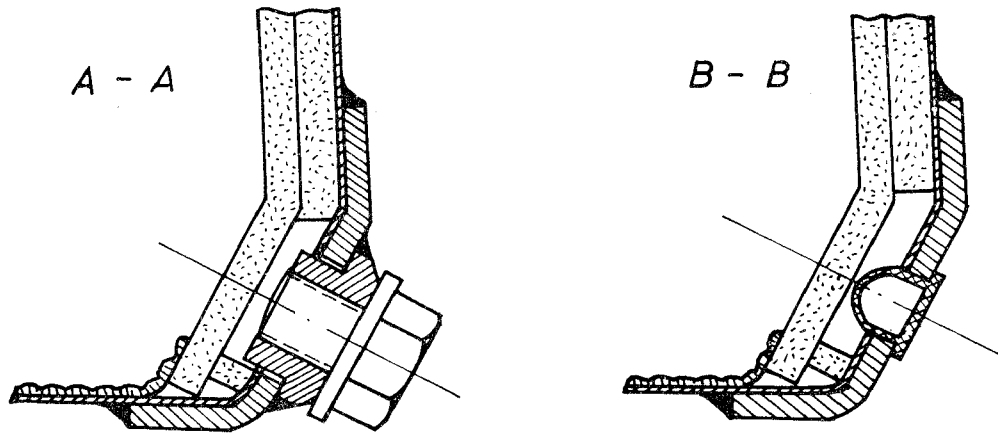


Fig. 2

Pierce through the opening with a marking tool and cut out floor covering in A-A and B-B. Screw counter nuts on the shackles and insert shackles. Fasten shackles with hexagon nuts M 8x1 DIN 934-6S gal Zn 9 from the vehicle underside (see Fig. 3).

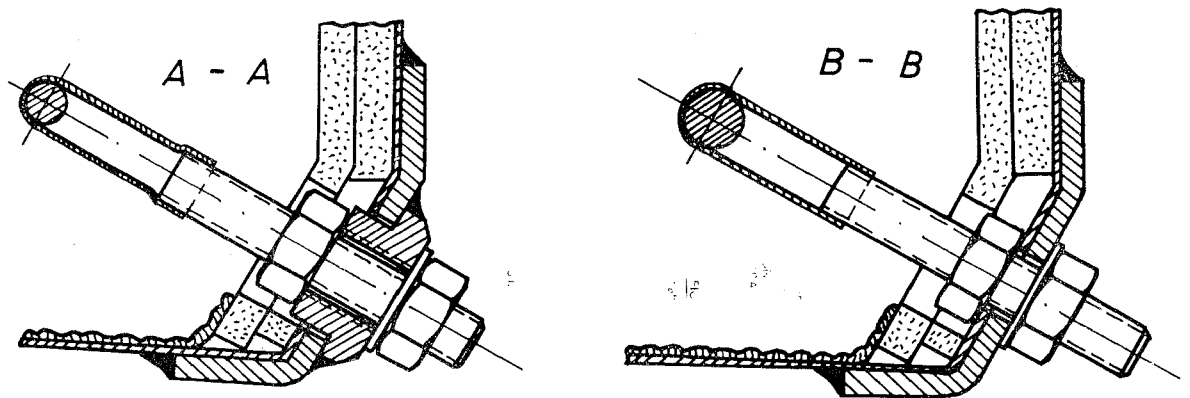


Fig. 3

In several countries (USA for example) the regulations require the mounting of a threaded bolt for the anchorage. The threaded bolt 7/16" is screwed in A-A.

Mounting

Remove locking screws in A-A. Cut out floor covering. Screw in 7/16" threaded bolt and fasten with a nut from the vehicle underside. Add spring washer.

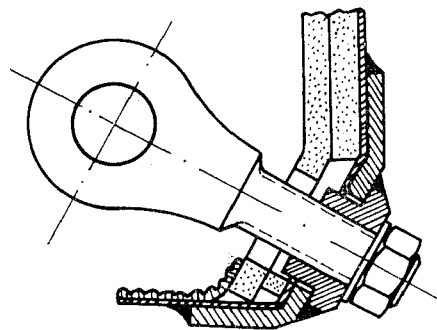


Fig. 4

b) Diagonal shoulder safety belts

A diagonal shoulder safety belt (complete) is supplied by us under the spare part No. 644.803.011.02, with the following anchorage parts:

1 Shackle	644.803.111.02
2 Spring washers 8 DIN 137 bost.	900.028.010.01
4 Hexagon nuts M 8x1 DIN 934-6S gal Zn9	900.076.014.02
1 Retaining bolt	644.803.121.00
1 Round anchor plate	644.803.123.00
1 Spring ring 8 DIN 7980 bost.	900.142.002.01
1 Spring ring 12 DIN 7980 bost.	900.142.004.01
1 Head screw M 8x45 DIN 6912-8G gal Zn 9	900.119.007.02

The installed diagonal shoulder belt passes from the right bottom side over the left shoulder of the occupant sitting on the left side and is fastened with a retaining bolt to the left rear side of the car's interior. The belt for the right seat occupant passes over his right shoulder and is mounted to the right rear side.

Mounting anchorage parts

Install shackle behind the front seat, see item a).

Cut out lateral covering at the anchorage point in the rear of the car's interior (see Fig. 5)

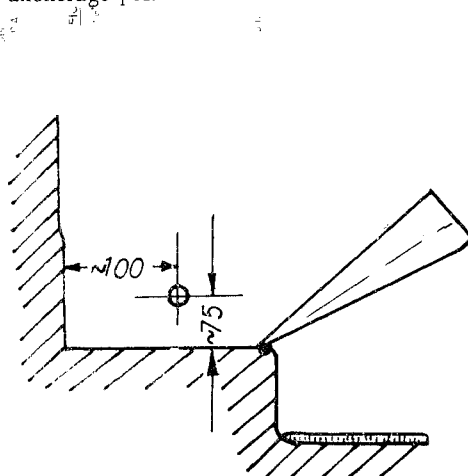


Fig. 5

Insert spring ring 12 DIN 7980 bost. in the welded-in metal piece, mount round anchor plate and fasten retaining bolt (644.803.121.00) with head screw M 8x45 DIN 6912-8G gal Zn 9 on the metal piece. Add a spring ring 8 DIN 7980 bost. under the head screw.

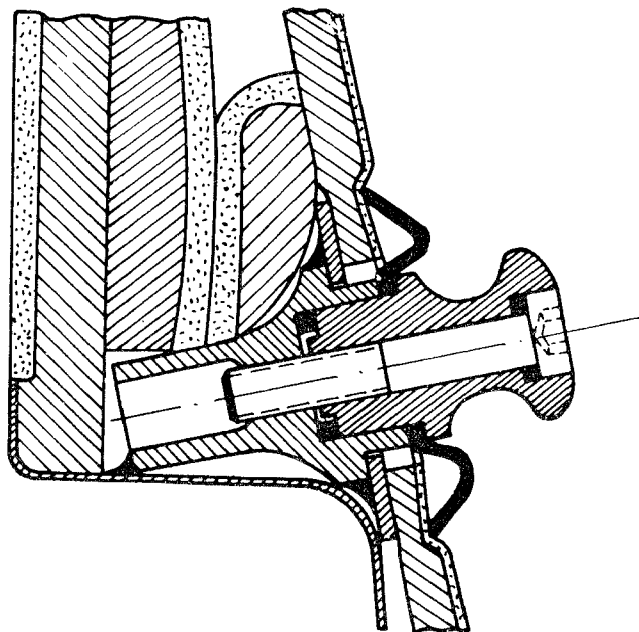


Fig. 6

c) Diagonal-plus-lap safety belts

The complete diagonal-plus-lap safety belt has the spare part No. 644.803.011.03.

The following anchorage parts are necessary:

2 Shackles	644.803.111.02
4 Spring washers B 8 DIN 137 bost.	900.028.010.01
8 Hexagon nuts M 8x1 DIN 934-6S gal Zn 9	900.076.014.02
1 Retaining bolt	644.803.121.00
1 Round anchor plate	644.803.123.00
1 Spring ring 8 DIN 7980 bost.	900.142.002.01
1 Spring ring 12 DIN 7980 bost.	900.142.004.01
1 Head screw M 8x45 DIN 6912-8G gal Zn 9	900.119.007.02

The mounting of the anchorage parts is to be carried out according to operations a) and b).

(With the round anchor plate as standard equipment it is necessary to remove the countersunk screw and the centering disc in order to mount the retaining bolt 644.803.121.00 (see Fig. 6).

Modified anchorage parts for safety belts

Shackle 644,803,111,02 is being replaced by retaining bolt 644,803,122,00.

(However shackle 644,803,111,02 is still being used for subsequent installation into vehicles without anchorage points.)

Retaining bolt 644,803,122,00 can be installed into all vehicles as of serial No.

Coupe 120 620

and/or 210 931

Cabriolet 156 850

Mounting retaining bolt:

Remove countersunk screw in A-A and screw in retaining bolt with spacer tube (see sketches).

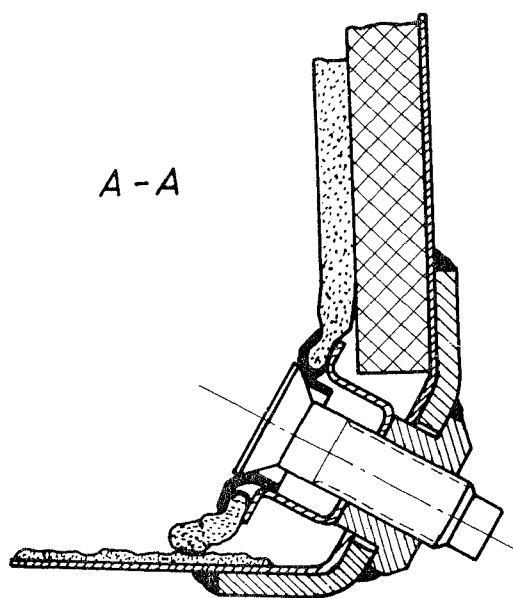


Fig. 7

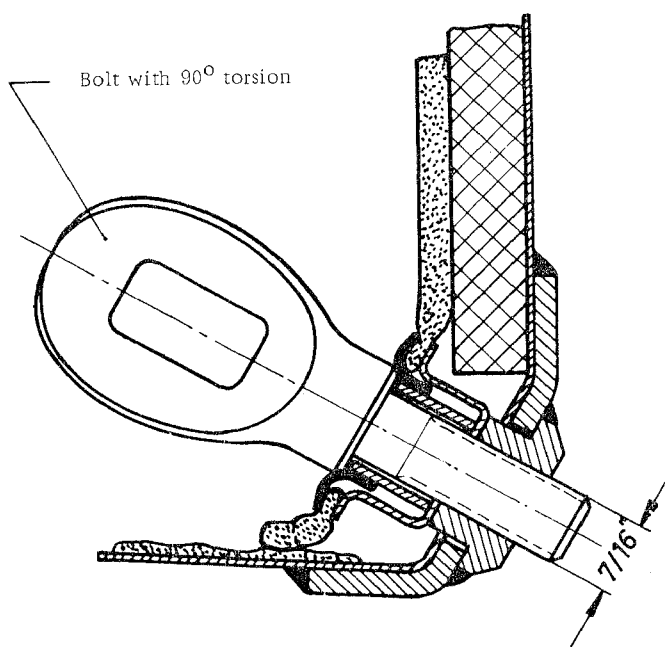


Fig. 8

Subsequent installation of anchorage parts for safety belts

In vehicles as of type 356 A

Coupe 101 693

Cabriolet 150 001

Speedster 83 792

a subsequent installation of anchorage parts for air-line safety belts, diagonal shoulder safety belts or combined diagonal-plus-lap safety belts is possible.

As anchorage parts are used: shackles, spare part No. 644.803.111.02; with nuts M 8x1 DIN 934-6S gal Zn 9, spare part No. 900.076.014.02, 4 each; and spring washers B 8 DIN 137 bost., spare part No. 900.028.010.01, 2 each; and/or spring rings 8 DIN 7980 bost., spare part No. 900.142.002.01, 2 each. The shackles are screwed on to the vertical sheeting by means of a reinforcement plate from the outside. The same shackles are used for the fastening of diagonal shoulder safety belts to the rear side-wall of the car's interior. To obtain the necessary rigidity, two reinforcement plates for each shackle have to be made (as per sketch), and mounted as described.

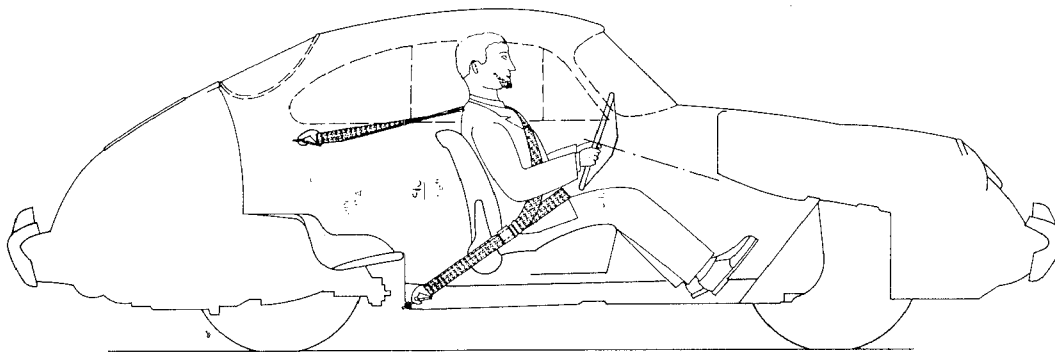


Fig. 1

Mounting of anchorage parts for diagonal shoulder safety belts in the rear of the car's interior

Operation

1. Make reinforcement plates (as per sketch) to fasten the shackles to the side-wall in the rear of the car's interior (see Fig. 2).
2. Remove coverstrip and/or lateral covering in the rear of the Cabriolet.

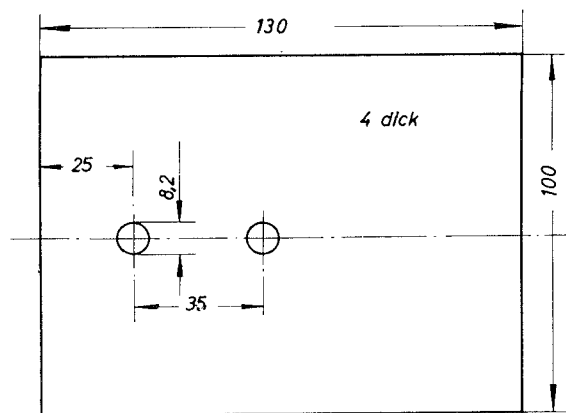


Fig. 2

3. Trace holes (as per sketch) to fasten the shackles (for the Coupe see Fig. 3 and 4, for the Cabriolet Fig. 5 and 6).

Coupe

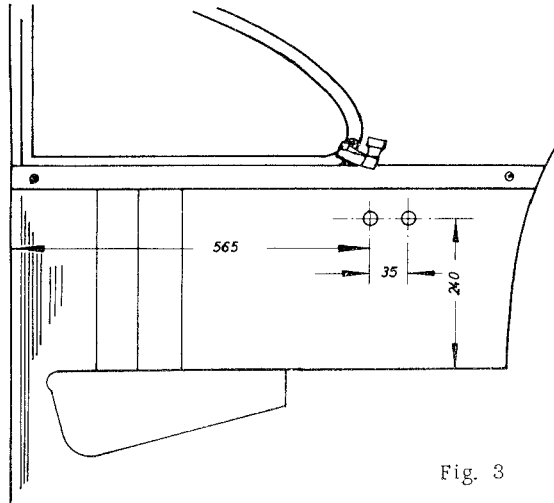


Fig. 3

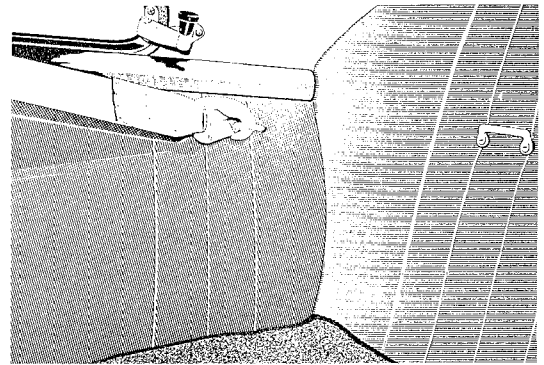


Fig. 4

Cabriolet

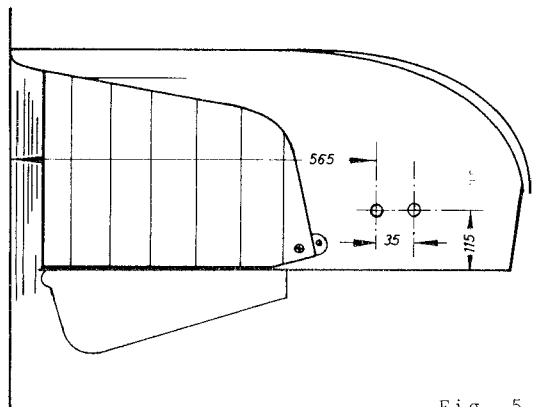


Fig. 5

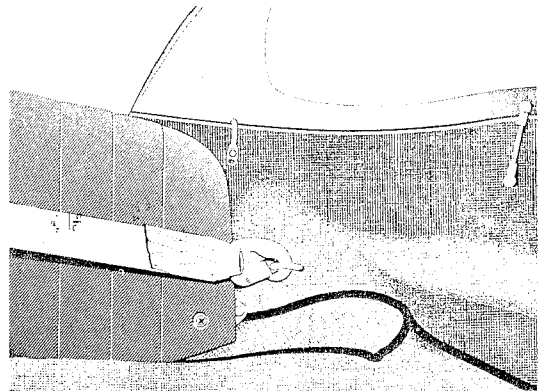


Fig. 6

4. To avoid a rolling up or tearing of the covering, press one of the punched reinforcement plates to the marked spot of the covering when piercing the holes from the inside to the outside of the vehicle.

5. With the Coupe remove the retaining clips for the interior covering and detach with palm the covering of the wheel housing.
6. Push the shackle through the interior covering and unscrew the nuts behind the covering so far that the loop of the shackle protrudes about 18 mm into the rear of the car.

Installation of anchorage parts for air-line or diagonal shoulder safety belts to the vertical sheeting

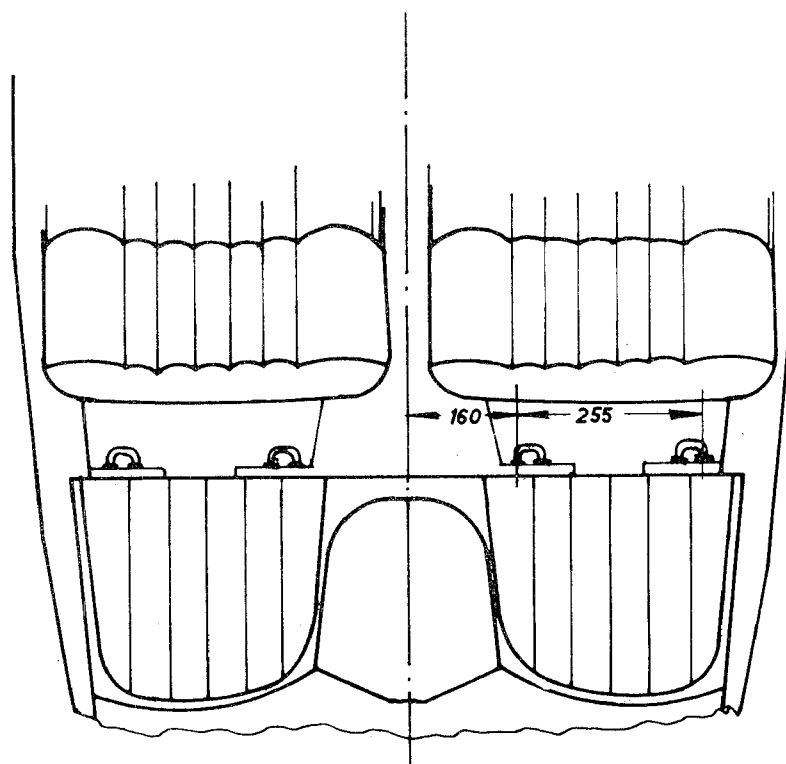


Fig. 8

1. Mark the position of the 4 shackles according to sketch and trace through the covering by means of an awl (see Fig. 8).
2. Detach covering and pierce through the side-wall with a 8,2 mm Ø driller.
3. Punch the marked positions of the Boucle-covering with a 8 mm Ø hollow punch.
4. Push the shackle through the Boucle-covering and screw on counter nuts. Treat reinforcement flap with body sealing compound and push shackle through the holes of the vertical sheeting. Mount reinforcement flap and tighten with spring ring and nut (see Fig. 9).
5. Treat the fastening, from the outside, with body sealing compound.

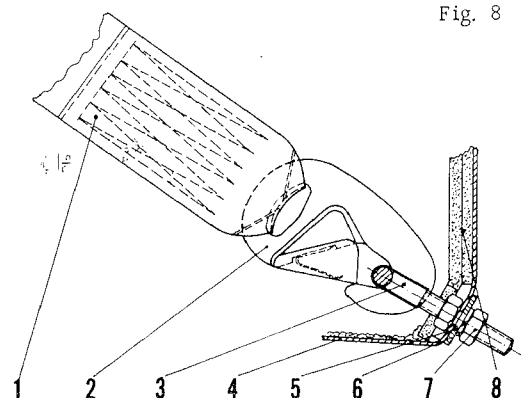


Fig. 9

- | | |
|----------------|-----------------------|
| 1. Safety belt | 5. Reinforcement flap |
| 2. Hook | 6. Spring ring |
| 3. Shackle | 7. Nut |
| 4. Body bottom | 8. Covering(Bouclé) |

Note:

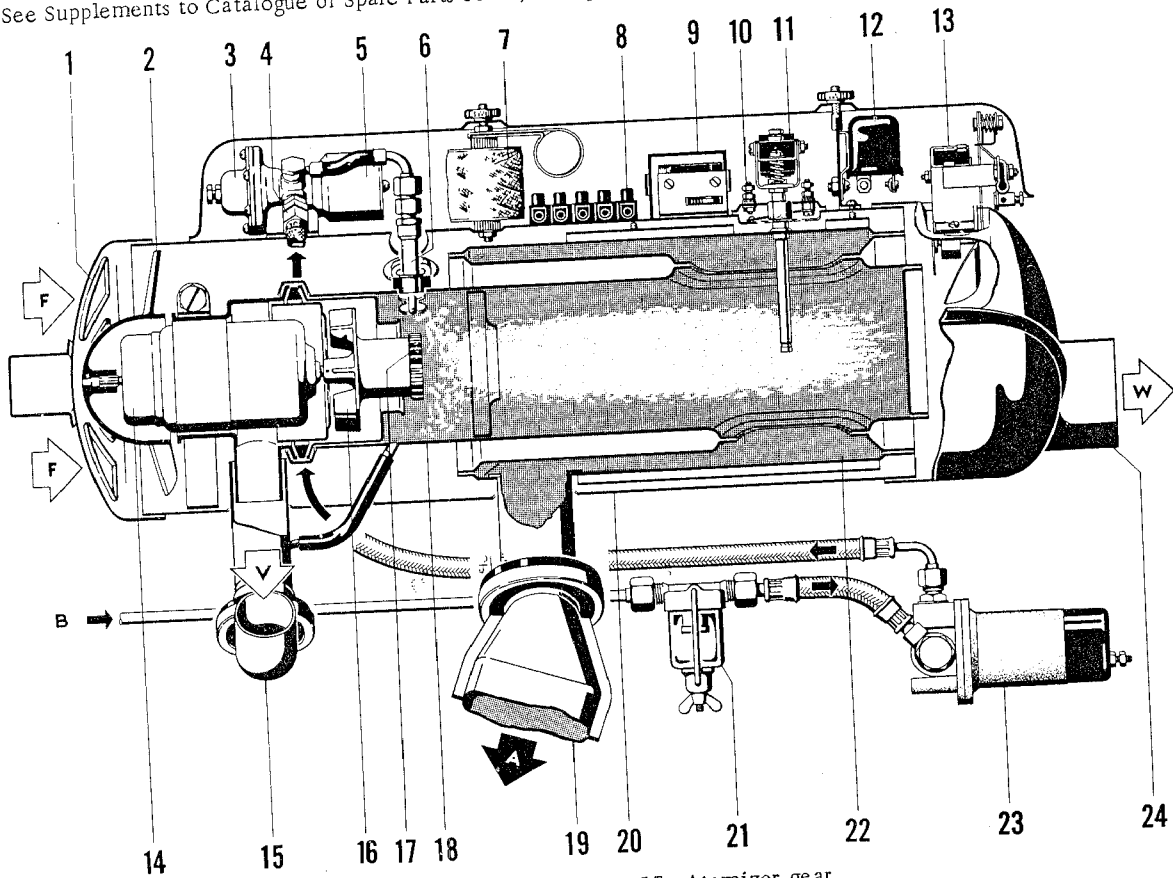
The shackles mounted to the vertical sheeting have a test-load of about 1500 kg each. This corresponds to American standards.

For cars not registered in the Federal Republic, verify, whether the 1500 kg test-load corresponds to the regulations of the country in question.

HEATING AGGREGATE, MODEL BN 4

The Eberspächer BN 4 Heater will be installed either in the 6 or the 12 volt execution, according to the car's electrical system. Please pay the necessary attention when ordering spare parts.

See Supplements to Catalogue of Spare Parts 356 B, Group 7/13 aA and 7/13 A.



1. Cover plate
2. Fresh air fan
3. Pressure governor
4. Fuel line connection
5. Magnetic valve
6. Injector
7. Ignition coil
8. Cable connector

9. Safety switch
10. Overheat safety switch
11. Thermo switch
12. Relay
13. Governor switch
14. Electric motor
15. Air intake
16. Fan for burner

17. Atomizer gear
18. Combustion chamber
19. Exhaust pipe
20. Outer housing
21. Fuel filter
22. Heat exchanger
23. Fuel pump
24. Hot air discharge

Fig. 1

F = fresh air
W = hot air
V = combustion air
A = exhausts

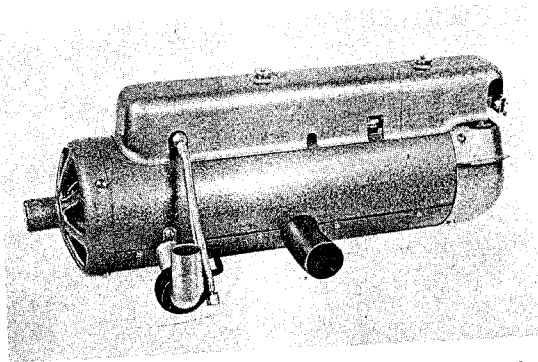


Fig. 2

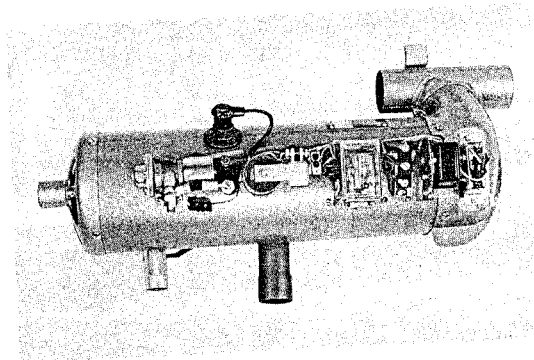


Fig. 3

Disassembly

1. Unscrew two knurled attaching nuts and remove heater cover (reference Fig. 2 and 3).
2. Detach fuel inlet line at base of pressure regulator while holding second coupling nut with another wrench, otherwise damage might occur to micro-filter insert.
3. Detach fuel outlet line on body of pressure regulator by unscrewing the banjo bolt. Loosen fuel line coupling on top of fuel nozzle (note filter screen located between fuel nozzle and fuel line, handling it with care).
4. Disconnect wire connection of fuel solenoid at No. 3 terminal, pull wire out of conduit hose.
5. Unscrew four round-head retaining screws at base of body and remove pressure regulator.
11. The coil and condenser may be removed from the supporting stud after having removed the retaining hex-nut and both wire connections at the condenser.
12. Detach wire terminals at safety switch.
13. Safety switch may be removed after loosening two round-head retaining screws on the foreside of switch.
14. Detach three wire terminal connections of thermostat switch.
15. Loosen coupling nut and pull out sensor tube of safety switch, going about it without the use of force; if necessary, apply a rust solvent and withdraw switch with a slight twisting motion (reference Fig. 5 and arrow).

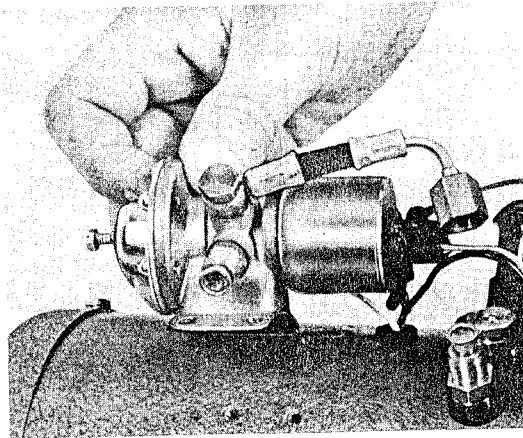


Fig. 4

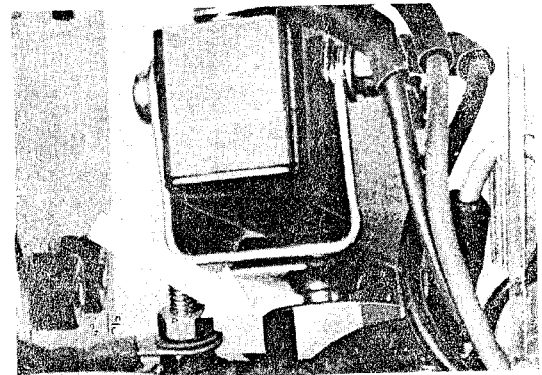


Fig. 5

6. Unscrew coupling nut and remove fuel line.
7. Unscrew intermediate piece containing filter insert.
8. While holding nozzle carrier with a wrench, unscrew nozzle and withdraw from carrier.
9. Pull spark plug cap off, remove and inspect spark plug.
10. The preheat plug, or glow plug, is of stick-type. It is located next to the nozzle and may be removed using a spark plug wrench.
16. Having removed the thermostat switch and detached wire terminals of overheat switch, the latter can be removed by unscrewing four round-head retaining screws.

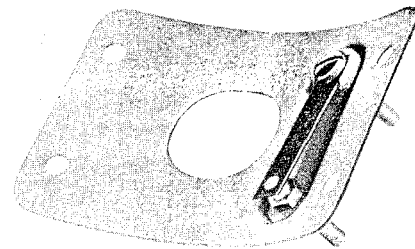


Fig. 6

Reassembling Heater Unit

A defective air blower assembly or heat exchanger are to be replaced as whole units, repairs being not permissible (ref. page S TRA 36, Heat Exchanger).

Reassembly

Reassembly is accomplished in reversed order of the above, devoting attention to the following points:

1. When mounting blower unit in heat exchanger, make certain that the ventilating air intake duct lines up with the exhaust duct.
2. Slide the outside shell over blower and heat exchanger, pull electric wire for blower through the orifice provided, and insert rubber grommet.
3. Install and connect remaining components in appropriate order.
4. Contact spring in overheat switch should have a preload pressure of 70 grams, and should open at a discharge air temperature of 150 to 200°C. The contact spring cannot be readjusted and must be replaced when defective.
5. When installing the thermoswitch, care should be taken not to allow the coupling nut to rest against the outside case of the heater when tightened.
6. Before installing the safety switch, check if both coil terminals (small cylindrical case), as well as the contact surfaces are in good condition.
7. Safety switch should be adjusted after the heater has been reassembled (reference page S TRA 34, Description of Safety Switch). Repairs are not permissible.
8. Install coil and condenser. The coil may be tested in the same way as engine coils are (testing at the rate of 5000 interruptions, with spark crossing a 6 mm gap).
9. Before installing fuel nozzle, clear the permanently seated micro-filter with a blast of clean compressed air, blowing only in the direction of fuel flow.
10. Check filter insert in intermediate piece for defects in filter screen, replace if necessary.
11. When tightening couplings, it is always necessary to hold the counterpart with another wrench.
12. Nozzle spray pattern should be checked when reassembly is completed. This visual inspection is made possible by removing the spark plug and glow plug, and illuminating the diffuser wheel through the glow plug orifice. The spray pattern must fall 1 mm off center of diffuser wheel in the direction of the ventilating air blower.
13. Inspect spark plug prior to installation. Spark plug gap should be 2.5 mm. Carbon deposits must be removed from the electrode insulator by means of a brass brush or sand blasting.
14. The glow plug may be cleaned in the same way as the spark plug.
15. Install pressure regulator and fuel solenoid assembly, connect fuel lines.

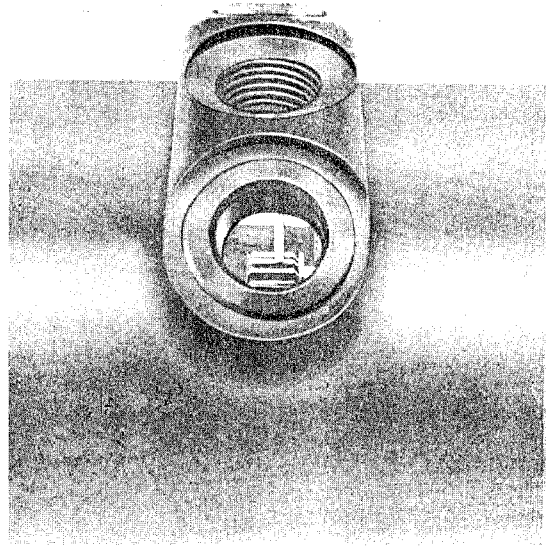


Fig. 12

F U E L P U M P

Description

The electric fuel pump is capable of drawing fuel to the height of 1 meter; it develops a pumping pressure of 0.1 atmospheres.

When the pump is at rest, the points are in contact. The current passes through the coil so that the armature plate - and with it the entire diaphragm system - is pulled towards the breaker mechanism, thus sucking fuel into the combustion chamber through the suction valve. At the end of the stroke, the circuit is broken by the breaker mechanism and a spring brings the diaphragm system back to its original position, thus forcing fuel from the pumping chamber through the delivery valve into the supply line.

Inspection and adjustments

The pump should be mounted in horizontal position with the fuel outlet pointing up (see arrow). Contact gap, with blade against the stop, should be 1 mm (gently press the lower contact blade against housing). An adjustment is possible by means of an adjustment screw. It is recommended to lightly lubricate the rocker pivot points once per year.

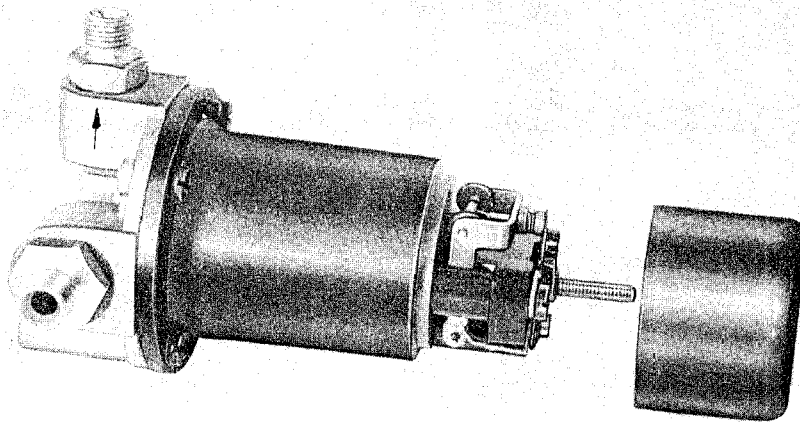


Fig. 13

PRESSURE REGULATOR AND FUEL SOLENOID ASSEMBLY

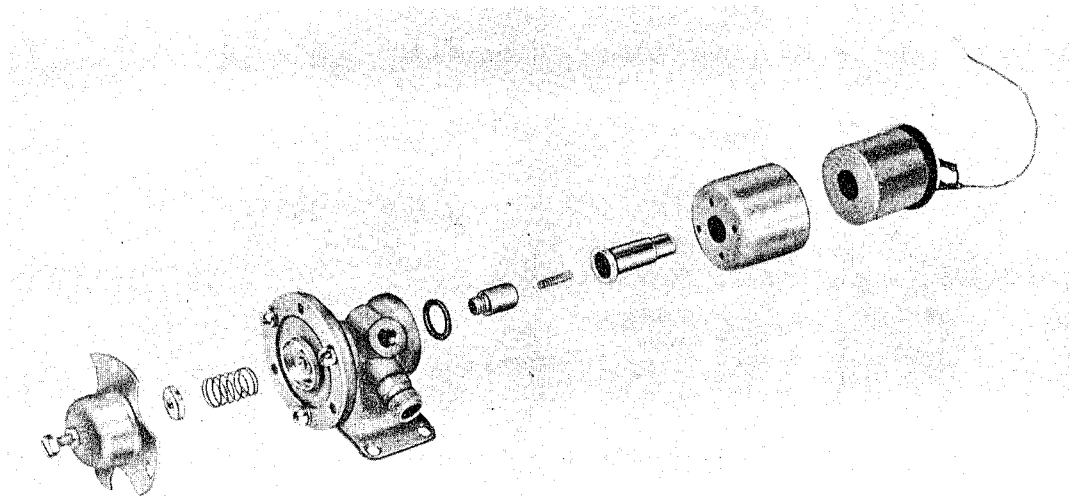


Fig. 14

Description

The pressure regulator governs the rate of fuel flow according to preset diaphragm settings. An exact adjustment to the rated output of .65 liter/hour can be accomplished only when the assembly is installed in the heater unit.

Inspection and Adjustments

With heater unit installed, it is necessary to first remove the cover and detach the fuel supply line. Next, the fuel nozzle has to be removed, its fuel supply line reconnected, and the nozzle held at the same level as in the installed position. The fuel emitted from the nozzle should then be trapped in a graduated measuring glass; the collected amount of fuel, after an elapsed time of two minutes, should be 20 to 21 cc. When necessary, the pressure regulator can be readjusted by turning the fourfold sealed adjustment screw on the forside of the unit (the seal is by means of paint); by turning the screw clockwise, the emission of fuel is increased; by turning it counter-clockwise, the emission is decreased. At time of this service operation attention should be devoted to the safety switch which should cut off the flow of current after a maximum elapsed time of 3 1/2 minutes.

Disassembly

Disassembling is permissible but only when complete exchange assemblies are not available.

1. Located in the cover on the foreside of the pressure regulator is a red, paint-sealed adjustment screw with a lock nut. The cover may be removed after unscrewing three round-head retaining screws (spaced 120° apart); this will expose the pressure plate, spring, and diaphragm.
2. The diaphragm may be withdrawn after removing the retaining collar which is secured by three round-head screws. The parts may not be repaired and if found defective, must be replaced.
3. The housing which accommodates the pressure rod, spring, and shut-off valve may now be removed with the help of a socket wrench.

Reassembly

Reassembly is accomplished in reversed order of the above, devoting attention to the following points:

1. It should be ascertained that the pressure rod moves freely in its guide after the parts have been thoroughly cleaned.
2. The diaphragm must be placed in such way that the brass disc faces towards the pressure rod.
3. When installing the housing cover, first insert the pressure spring into the sheetmetal receptacle of the diaphragm, and then place the pressure plate in appropriate position making certain that the adjustment screw rests in the cavity in the plate.
4. Adjustment of the rate of fuel flow is accomplished on ready assembled heater unit; refer to Description, Inspection and Adjustment of Pressure Regulator.

FUEL SOLENOID VALVE

Description:

The fuel solenoid shuts off the fuel supply as soon as the combustion process is interrupted by the heater control switch. The flow of fuel is stopped by a synthetic-rubber valve which is pressed against the valve seat.

Inspection

The proper functioning of the fuel solenoid may be audibly verified by a clicking noise which is released by the slamming action of the valve in valve guide when it is energized. If the valve sticks, functioning only when jarred, it will be necessary to completely disassemble the fuel solenoid. However, it is recommended that in such case the complete pressure regulator and fuel solenoid assembly is removed from the heater unit.

Disassembly

1. Remove round-head screw located on foreside of fuel solenoid, remove cover, detach ground wire connection, and withdraw solenoid coil from housing.
2. Remove four lens-head screws in base of housing and carefully withdraw housing with valve guide. Note that the valve may jump out if under spring pressure (reference Fig. 4).

Reassembly

Reassembly is accomplished in reversed order of the above, devoting attention to the following points:

1. The valve should not show any trace of corrosion on the cylindrical shaft; if corroded, it must be replaced.
2. The sealing side of the synthetic-rubber valve should be visually inspected for proper seating, that is, the seating impression must be round and in the center. If the impression is imperfect, it will be necessary to replace the pressure regulator housing and valve seat.
3. In no case may the pressure spring be lengthened or shortened.

S A F E T Y S W I T C H

Description

This switch prevents that the heat exchanger is flooded with fuel if combustion should fail for any reason. The switch consists of a coil, wired parallel to the glow plug, which heats a bi-metal contact strip which interrupts the flow of current to the fuel pump and fuel solenoid after having been energized for 2 to 3 1/2 minutes (this cannot be determined by the position of the red lever).

Inspection and Adjustments

The inspection and adjustment procedure can be undertaken only in a closed, draft-free room. The rated activation time, at nominal voltage, is 2 to 3 1/2 minutes after energizing the coil. Is a corrective adjustment necessary, the paint-sealed adjustment screw located on the right side of the base plate (reference Fig. 15 and arrow) should be turned clockwise to shorten the activation period, and counter-clockwise to extend it (allow 15 minutes for cooling prior to each test). If found defective, the complete switch assembly will have to be replaced.

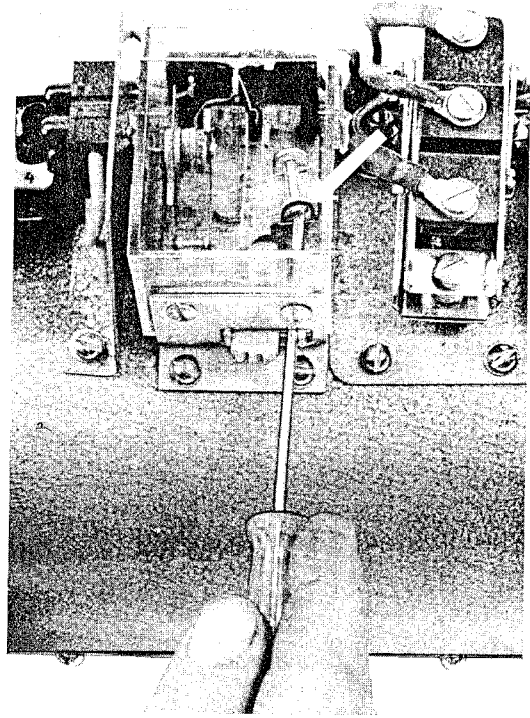


Fig. 15

T H E R M O S W I T C H

Inspection and adjustments

The thermoswitch is correctly adjusted when the blower motor continues to run for approximately 3 minutes during the purging cycle, when the heater has been turned off after reaching normal operating temperature. If the purging cycle is too long, the thermoswitch adjusting screw should be turned clockwise; if it is too short, the screw must be turned counter-clockwise. Refer to paragraph 4, Reassembly, for basic settings of the switch.

Disassembly

1. Remove the red or green paint-sealed adjusting screw, and pull out helical spring.
2. Raise the now hinged switch, together with arm, remove leafspring, and withdraw the quartz bar by slanting the switch on its pivot (see illustration).

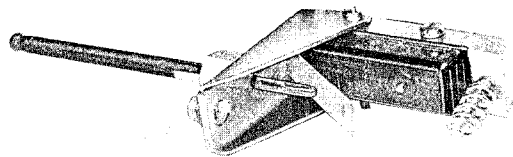


Fig. 16

Reassembly

Reassembly is accomplished in reversed order of the above, devoting attention to the following points:

1. It should be noted that the switch guide fixture can be easily turned; if necessary, slightly loosen the retaining screw (CM 3.5 x 30).
2. The inside part of the thermoswitch sensor tube must be clean.
3. The quartz bar ends should not show any sign of damage and should be freely movable inside the sensor tube.

4. Following reassembly, the thermoswitch should be readjusted. The basic adjustment at time of reassembly is made as follows: the red paint-sealed adjusting screw is tightened during reassembly until the switching throw takes place within the switch (audibly noticeable click), then the screw is turned another $1/3$ turn (120°).

5. The exact adjustment is accomplished in manner outlined at the beginning of this chapter.

HEATER CONTROL SWITCH

Description

Depending upon the discharge air temperature, the current supply for the fuel pump and fuel solenoid is opened or shut by a bi-metal spiral which is a part of the microswitch (heat thermostat). The switch response temperatures should be 45 to 55°C at the lowest heat output settings, and 80 to 90°C at high settings (readings taken in hot air duct).

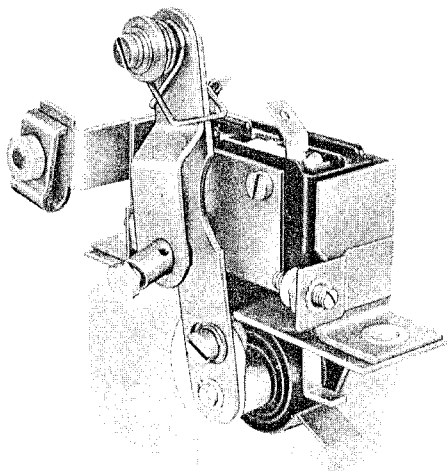


Fig. 17

Inspection and Adjustment

If the prescribed temperatures can not be realized, it is possible to rectify this trouble by readjusting the terminal stop screws of the control lever. If the microswitch had to be replaced for any reason, it will be necessary to completely readjust the new switch. Should it happen that the adjustment range of the terminal stop screws turns out to be insufficient it will be necessary to change the basic setting by loosening one round-head screw and changing the position of the lever in relation to the bi-metal spiral (oval orifice in the lever).

Disassembly

1. Remove two cylindric-head screws seated in switch body (at the level of Bowden-cable terminal) and withdraw the switch with the contact finger up.
2. To take out the Thermoflex spiral, it is necessary to remove the retaining ring on the pivot shaft, loosening the set screw in the control lever, and removing the control lever.

Reassembly

Reassembly is accomplished in reversed order of the above, devoting attention to the following points:

1. Make certain that the retaining screws on both contact lugs are firmly tightened.
2. The heater control switch must respond to a temperature of 45 to 50°C at lowest heat output setting, and to 90 to 100°C at the highest setting.
3. A subsequent adjustment of the heater control switch can be accomplished as outlined at the beginning of this chapter.

H E A T E X C H A N G E R

If the heater has been subjected to a prolonged operation under conditions involving an insufficient air supply (improper combustion resulting in soot deposits), it will be necessary to burn clean the heat exchanger and exhaust tube. This is accomplished in a shop, by a mechanic, without removing or disassembling the heater unit. By short-wiring (by-passing) the heater control switch, the heat exchanger is brought to a glowing, dark-red temperature (may be seen through intake opening), causing the carbon deposits to burn off under emission of sharp-smelling, grey-green fumes (the heat-cleaning procedure must be performed in an open area for obvious reasons). As soon as the smoke emission ceases, the ashlike deposits can be loosened by light tapping on the exhaust tube; the ash will then be blown out by the combustion blower. It is not permissible to repair the heat exchanger, and when found to be defective, it must be replaced as a unit.

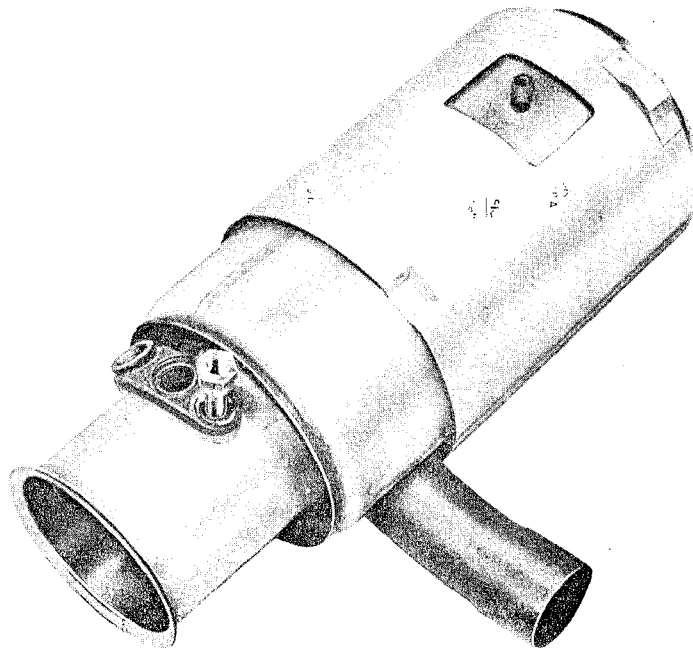
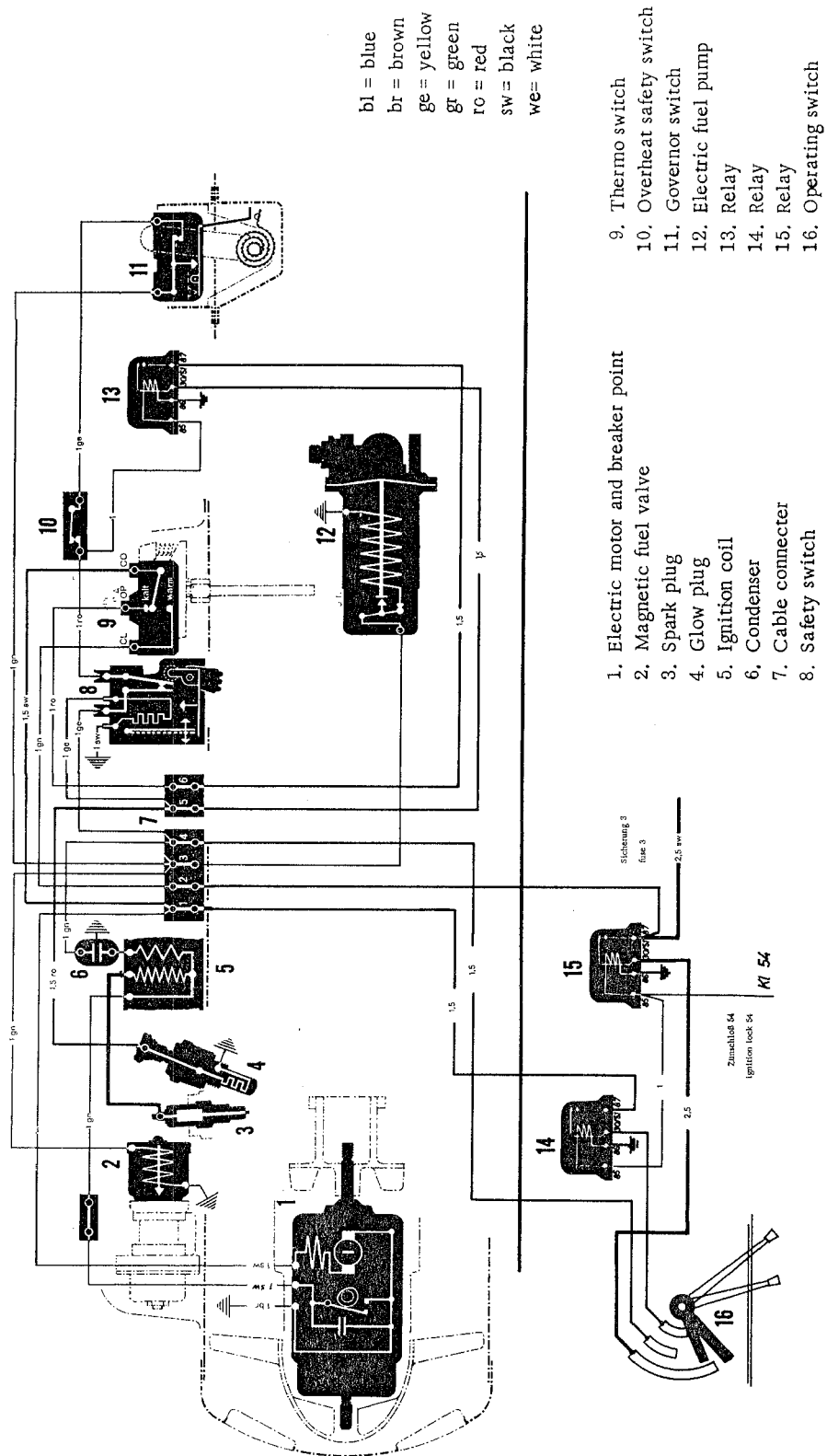


Fig. 18

WIRING DIAGRAM



HOW TO FIND FAILURES AT THE HEATER BN 4

The functional test can be carried out with the aggregate installed in the car.

Deficiency	Cause	Corrective Measures
Fan does not operate	Electric current interrupted	Check main fuses and relays
No fuel supplied	Safety switch has interrupted the fuel supply after 2-3.5 minutes of preheating	Press red lever to reset safety switch. If necessary wait 2 minutes for cooling down of heater resistor, so that switch can be reingaged
	Safety switch improperly adjusted	Check safety switches and adjust (see S TRA 34)
	Magnetic valve at the pressure governor does not open, coil faulty	Remove coil and replace by new one, see S TRA 33
Fuel supply interrupted	Fuel pump sticks	Clean breaker points and readjust, see S TRA 31
	Fuel line or filter leaking, fuel pump receives air	Check connections of fuel lines, especially gasket of filter inspection glass
	Filter clogged	Clean, arrow must correspond to flow direction to prevent internal clogging
	Hair filter at pressure control clogged	Remove pump pressure tube at the pressure control and clean hair filter with compressed air
	Control switch damaged	Check connections and function, see S TRA 35
	Safety switch damaged	Check contacts, see S TRA 35
	Pump has no output supply, noisy	Open fuel cock, pump receives air, relief valve on the pressure side of the pump is dry and sticks - remove pump pressure line and moisten with a few drops of fuel

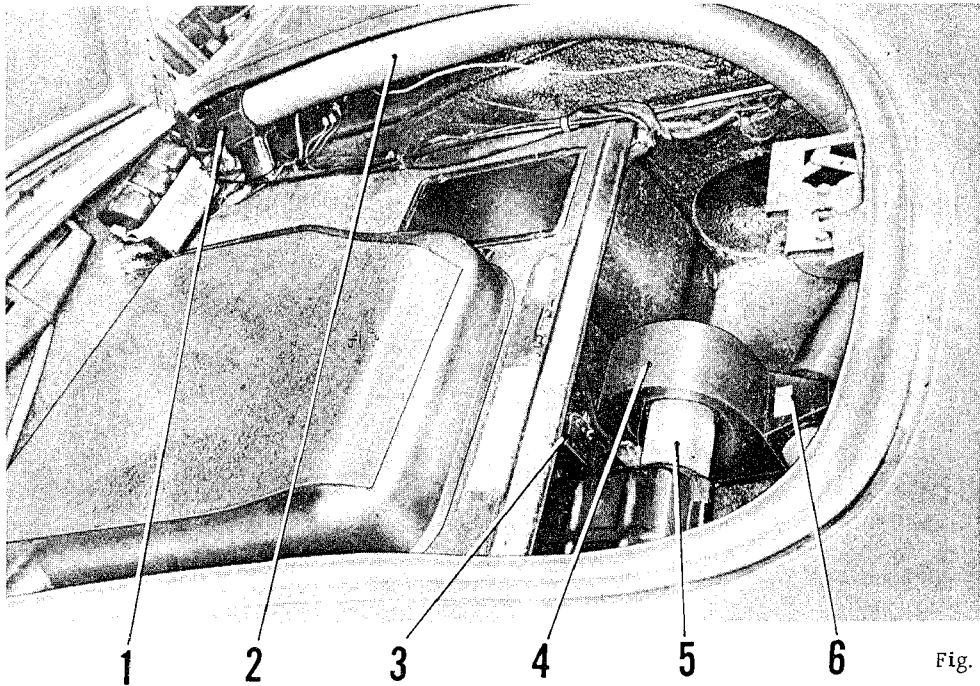
Deficiency	Cause	Corrective Measures
Fuel feed stopped	Fuel pump does not operate	Check breaker points, oil the spring plates and bearings (see S TRA 31)
	Pressure governor and magnetic valve not operating	Clean pressure governor and adjust (see S TRA 32)
	Magnetic valve jammed	Remove pressure governor with magnetic valve. Dismantle magnetic valve, clean or replace valve, if necessary (see S TRA 33)
	Fuel jet clogged or damaged	Fuel jet is damaged, does not inject fuel correctly to the gearing of the diffuser gear (observe through spark plug hole). See S TRA 30/12 Remove fuel line, clean jet, using dry compressed air (sealed-in hair sieve)
Ignition does not occur	Spark plug damaged or incorrect gap	Exchange spark plug, or adjust (spark gap: 2.5 mm)
	Ignition coil faulty, cable to spark plug interrupted, spark too weak	Exchange ignition coil, repair ignition cable
	Breaker point damaged	Exchange complete burner chamber
No air being supplied	Electric contacts for fan damaged or not connected	Tighten connection clamp No. 1 (see wiring diagram), check operating mechanism
	Electric motor faulty	Exchange complete combustion fan unit
Fan does not supply enough air	Intake combustion air is clogged through road dirt	Clean intake
	Exhaust back pressure too high, because of dirt or improper modifications	Clean, remove modification
Heater does not switch off	Incorrect wiring	Electric contact must be made on clamp 3, together with fuel pump and control switch (see wiring diagram)

Deficiency	Cause	Corrective Measures
Fan runs continuously	Improper adjustment of thermostat causes fan to run after heater shuts off	Adjust thermostat, see S TRA 34
	Fan runs continuously after heater shuts off	Quartz-element of thermostat broken, remove thermostat, replace quartz-element (see S TRA 34)
Heater aggregate soots, smokes, or works irregularly		
1. Excessive fuel	Fuel jet damaged	Exchange; clean only with compressed air in flow direction. Do not damage sealed-in hair sieve
	Pressure control not properly adjusted	Adjust pressure control. See S TRA 32
2. Lack of combustion air	Battery voltage below prescribed value of 5.8, 5.9 or 11.5 volts	Tighten cable connections, check battery, charge, if necessary
	Intake tube for combustion air clogged	Clean intake
	Fan does not reach prescribed speed of 5000 r. p. m. at correct voltage	Exchange combustion fan unit
	Guide vane housing damaged	Replace heat exchanger
3. Ignition misfires	Spark plug fouled through combustion products, insulation damaged	Clean spark plug, check gap of middle electrode (mean value 2.5 mm), replace, if necessary
	Ignition coil damaged or internal arcing	Replace ignition coil
	Relay jammed (see wiring diagram relay No. 13)	Replace
Heater fails to start	Fan motor has damaged bearings or windings	Replace complete combustion fan unit, do not attempt disassembly, since the unit has matched on balanced parts
	Diffuser gear is damaged or jammed in the guide vane housing	Replace complete combustion fan
	Breaker point worn or damaged	Replace complete combustion fan, both breaker points are not adjustable (riveted)

Installing Fresh-Air Blower

The Behr fresh-air blower can be installed as special order item in the below listed types of cars:

Coupe	from Serial No. 117 601
Cabriolet	from Serial No. 155 601
Karmann Hardtop	in Serial No. 201 601 - 202 299
Karmann Coupe	from Serial No. 210 001



- | | |
|------------------|-------------------------|
| 1 Fresh air duct | 4 Blower housing |
| 2 Flexible hose | 5 Blower motor |
| 3 Relay | 6 Distributing manifold |

The radially acting fresh-air blower is being installed in the front compartment behind the spare tire. With the fresh-air blower switched on, fresh air enters through the grill in front of the windshield and is pressed through the distributing manifold into the fresh air ducts via flexible hoses at the right and left compartment side. The fresh air is then conveyed

either to the windshield or to the floor by adjustment of the lower lever of the control unit.

The fresh-air blower has 2 control steps and is operated from the instrument panel. It is the same control unit as for the Eberspächer heater.

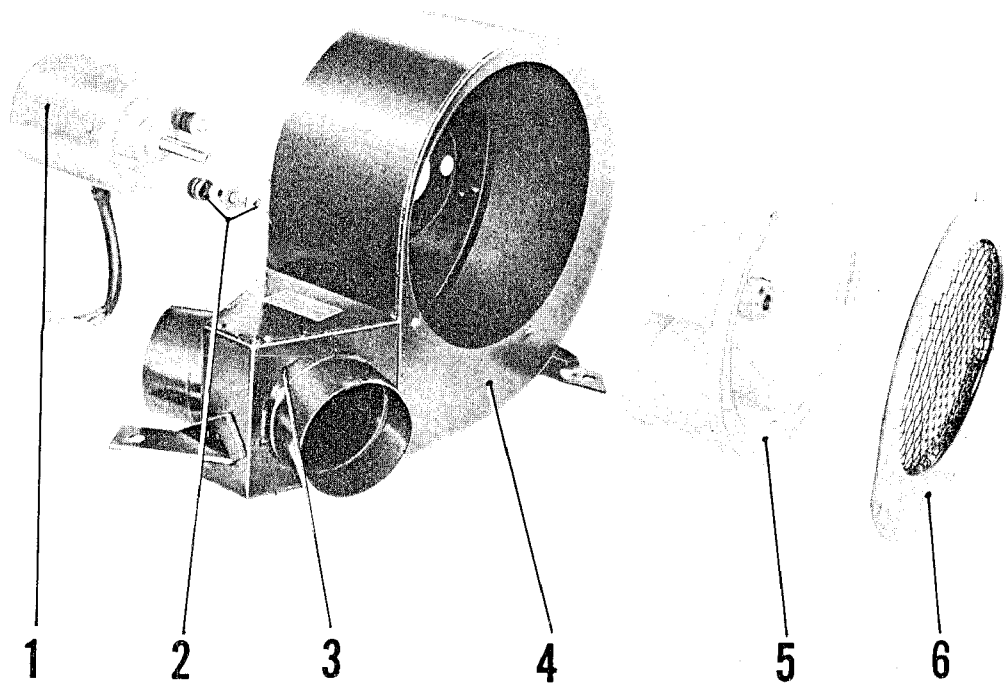


Fig. 2

- 1 Blower motor
- 2 Rubber bearing and fastening
- 3 Distributing manifold

- 4 Blower housing
- 5 Blower impeller
- 6 Cover plate

Operation:

First control step (see Fig. No. 3): Blower impeller rotates at 3000 r. p. m.

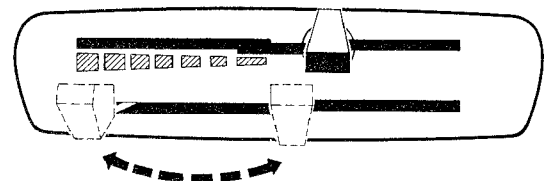


Fig. 3

Second control step: Blower impeller rotates at 4500 r. p. m., current consumption thereby approx. 70 Watt. Highest rate of air flow $2,8 \text{ m}^3$ per minute at 4500 r. p. m.

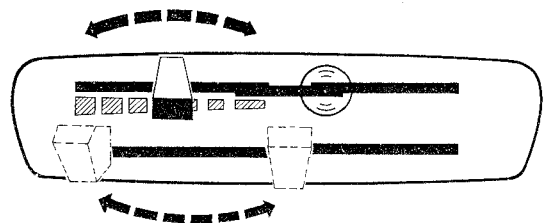


Fig. 4

Removing and installing control unit

For the removal and installation of the control unit and the Bowden control adjustment see Supplements Workshop Manual SB 11.

Attention!

The Bowden wire of the control unit, which serves to control the Eberspächer heater, is not necessary for the fresh-air blower. The Bowden wire can be removed or laid parallel to the left Bowden wire along the cable tree. In order to prevent a jamming of the Bowden wire at the envelope's end, a protective tubing must be slid on and fixed by compressing.

10 cm of a fuel pipe would offer a good protection.

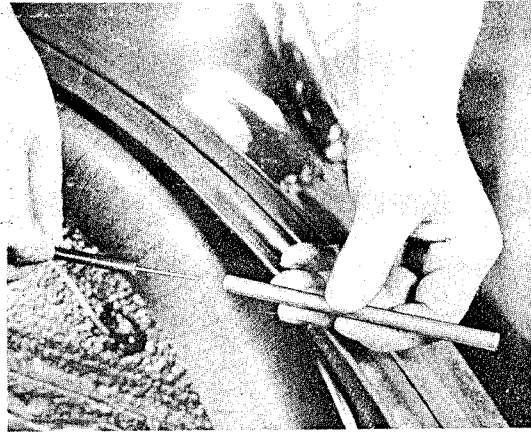


Fig. 5

Installing Fresh-Air Blower

1. Take out spare tire and remove plastic cover above fuel tank.
2. Mark holes to fix relay support on the rear wall of the front compartment (see Fig. 6) and bore with a 5.5 mm bore.
3. Working from the outside, insert relay support into these holes and mount nuts together with washers and spring rings.
4. Mount relay at the upper supporting stud and in the center of the relay support by means of a 5 mm cheese-head screw, so that the electric relay connections point to the left in driving direction.
5. Tighten the relay.

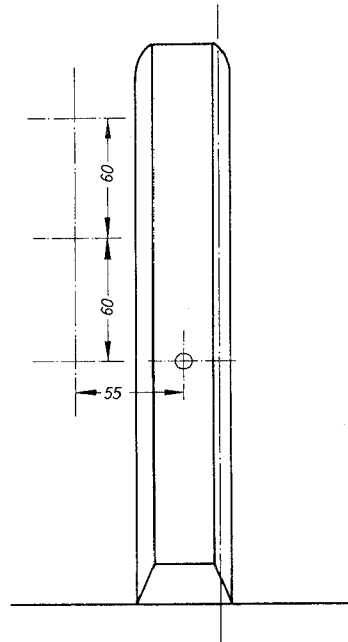


Fig. 6

6. Insert a 3 mm diam. welding wire into the cable tunnel which guides the battery cable to the rear.

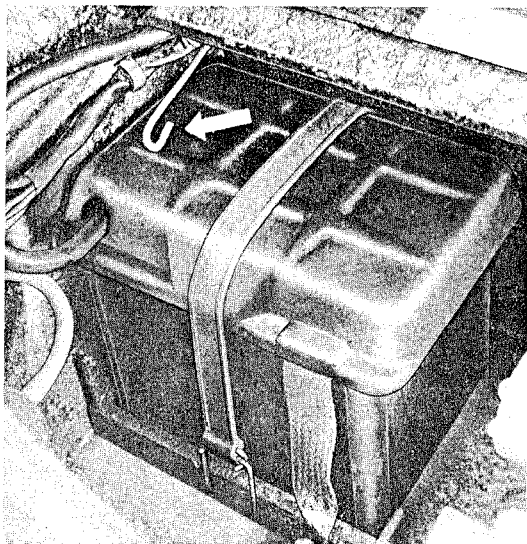


Fig. 7

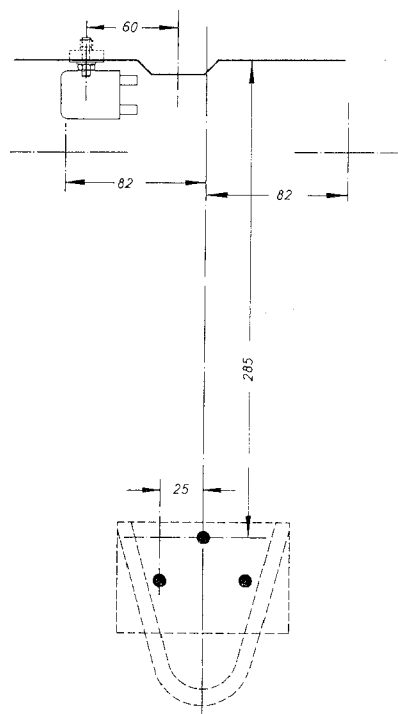


Fig. 8

7. Fasten the cable tree to the welding wire and pull it from the front compartment into the floor compartment.
8. Lay and fix cable tree behind the instrument panel. Slide cable No. 1 (see wiring diagram) into the front compartment, along the main wire loom.
9. Connect cable tree, see wiring diagrams.
10. Mark fixing points for rubber-metal bearings for fresh-air blower (see Fig. 8) and bore with a 6.5 mm bore.
11. Shorten supporting studs for the two rear rubber-metal bearings by approx. 5 mm.
12. Fix the three rubber-metal bearings with their proper screws onto the fresh-air blower.
13. Insert into bores the fresh-air blower with rubber-metal bearing studs and fix together with washer, spring ring and nut.
14. Connect plug-in connections of the cable tree with engine connection.
15. Slide onto the distributing manifold both elastic hoses and place them along the right and left front compartment side wall.
16. Slide on hose ends at air-inlet of fresh air ducts.
17. Check function of fresh-air blower and fresh air ducts.
See Supplements Workshop Manual SB 9 to SB 11.
18. Reinstall fuel tank cover and spare tire.

Wiring diagram

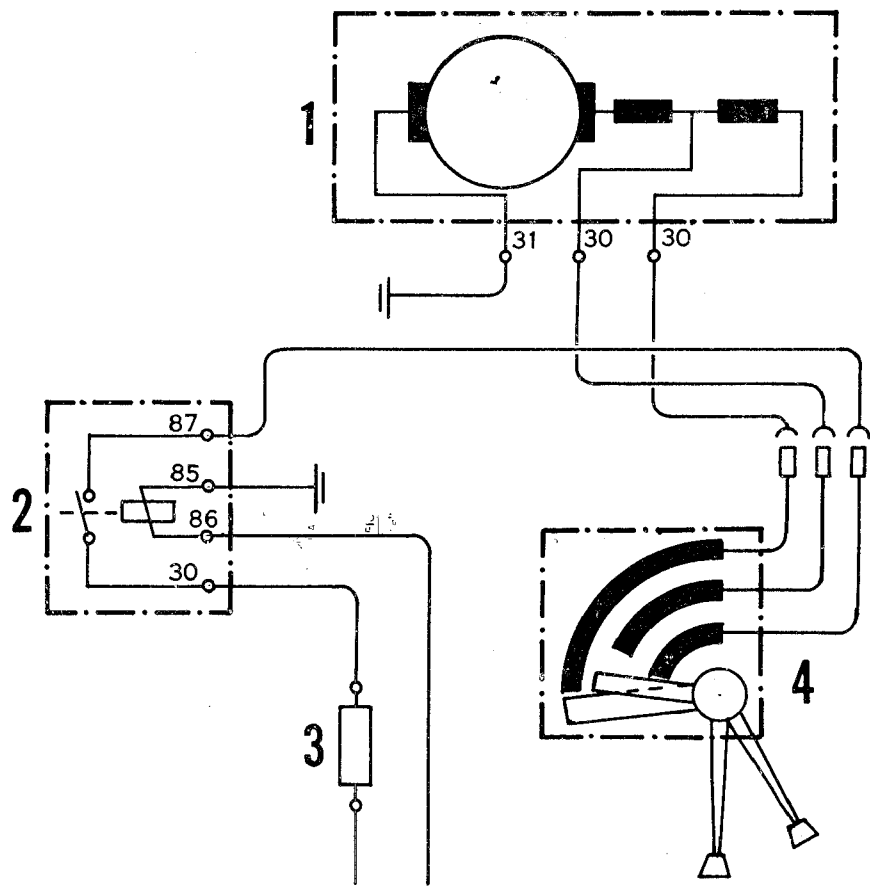


Fig. 9

- 1 Blower motor
- 2 Relay
- 3 Fuse 3 at fuse box
- 4 Control unit

Cable connections

Cable at plug-in connection of blower motor	brown	blue	black
Cable at cable tree end for blower motor	brown	blue/white	green/white
Cable at plug-in connection of control unit	green/white	blue/white	red/white
Cable at cable tree end for control unit	blue/white	green/white	red/white

Wiring diagram

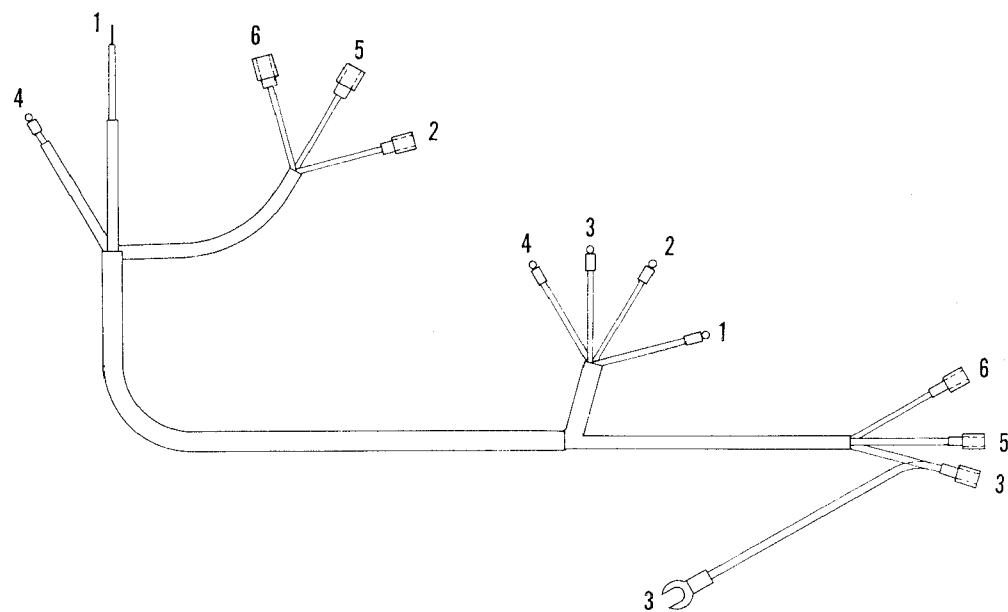


Fig. 10

No.	mm ²	Colour	from	to
1	2,5	red/black	Fuse 3	Relay 30/51
2	2,5	red/white	Control unit	Relay 87
3	2,5	brown	Ground - body	Engine relay 86
4	1	red/black	Ignition starter switch 54	Relay 85
5	1,5	blue/white	Control unit	Blower motor
6	1,5	green/white	Control unit	Blower motor

Subsequent Installation of an Outside/Inside Thermometer

Messrs VDO Tachometerwerke and Moto-Meter offer an outside/inside thermometer for installation.

Following indications are for the installation into vehicles as of

Serial No. Coupe	117 601
and	210 601
Cabriolet	155 601

(On former vehicles without a clock, a 61 mm diam. orifice for the installation of the indicator can be practised in a suitable position on the dashboard.)

General:

The proper function of the outside/inside thermometer depends on the correct installation of the outside sensor. The outside sensor must be fixed in such a way that it is not exposed to the direct air stream or the sun and where it is safe from damage. The inside of the bumper is the most favourable position. The capillary tube from the outside sensor to the indicator must be carefully handled and must not get bent or pulled. Moreover, any contact with current-carrying parts must be avoided.

Installing outside/inside thermometer

(The indicator is to be installed instead of the clock and the clock on the right hand side beside the glove box.)

1. Take out spare tire and disconnect battery.
2. Mark and then practise orifice on the right hand side beside the glove box (see Fig. 1).

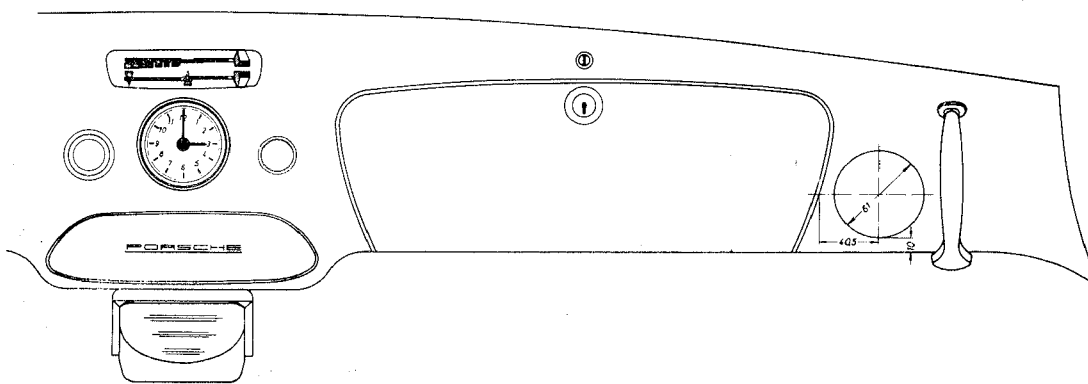


Fig. 1

3. Remove clock and reinstall into orifice beside the glove box. Reposition cables as appropriate.
4. Disconnect battery connecting terminal of cable and pull cable into driver's compartment.

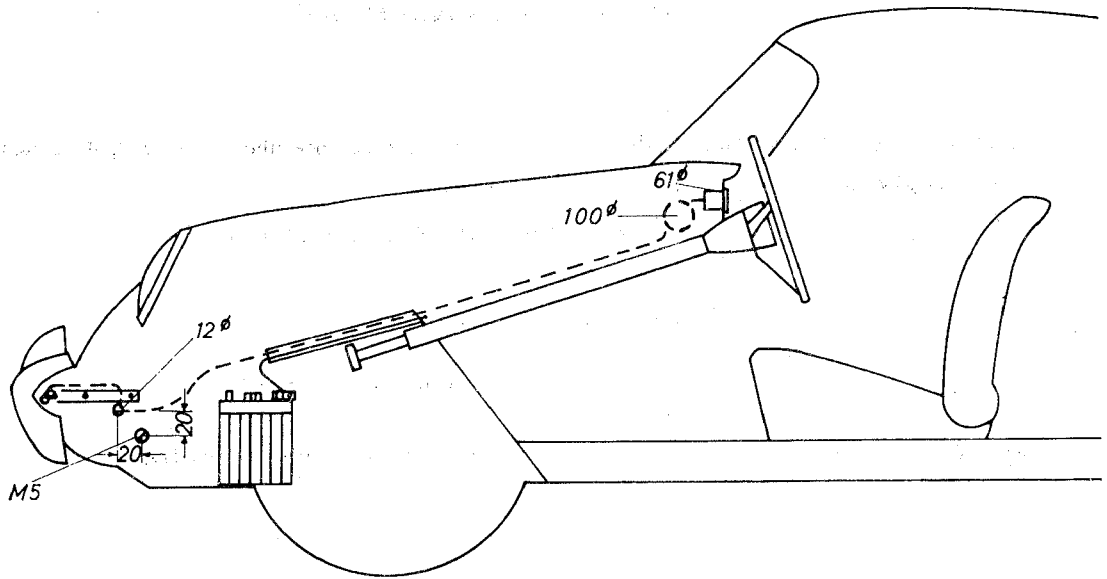


Fig. 2

5. Drill a 12 mm diam. hole into the right panel of the front compartment in front of the battery just above the earthing screw M 5 (see Fig. 2).
6. Guide the outside sensor through the orifice on the dashboard to the right hand side, then via the battery cable tube into the front compartment and through the 12 mm bore down to the bumper.
7. Fix the VDO outside sensor to the studs of the trim strip at the inside of the bumper using the screws showing to the right from the car's middle.
- 7a. The Moto-Meter outside sensor is best mounted by means of a clip lined with 2 mm thick rubber (see specifications for local manufacture Fig. 3). Fix the clip onto the first screw of the right bumper bracket, seen from the car's middle.

When using this clip a piece of flat steel must be fixed onto the above mentioned screw in order to facilitate the fixing.

8. Properly lay capillary tube from outside sensor over bumper bracket up to indicator.
- Seal 12 mm bore in the front compartment with grommet. Roll up and fix behind the dashboard any possibly remaining capillary tube (see Fig. 2).
9. Connect indicator lamp to circuit of instrument light (58b).
10. Connect indicator warning lamp to ignition/starter terminal 15/54.
11. Pull battery cable back into front compartment and connect.
12. To fix indicator mount clamp bracket from behind and tighten with clamp nuts.

Note: Any inaccurate indication can only be adjusted by the manufacturers or their representatives.

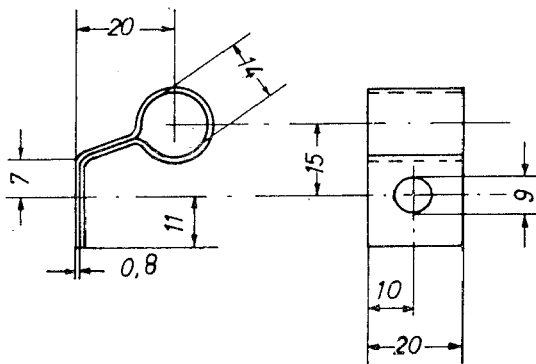


Fig. 3

TRAILER HITCH

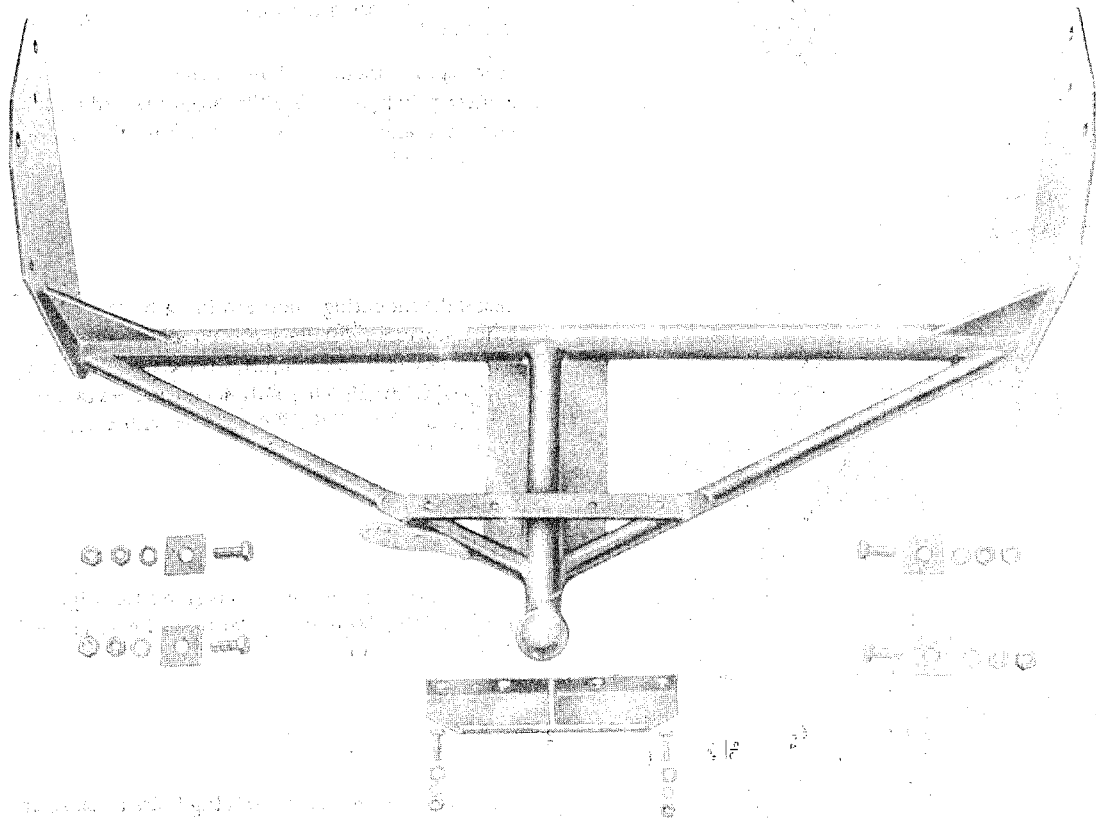


Fig. 1

Installation

1. Loosen bumper bracket retaining bolts at body and bumper.
2. Pull bumper back by about 1/2 inch and detach cable for license plate illumination.
3. Withdraw bumper, together with brackets, from the body.
4. Scrape off undercoating in the areas to be covered by the hitch mounting plate and, on the engine side, where washers will fit, in order to provide a clean, metallic base for mounting.
5. Slide the trailer hitch assembly into place and secure with bumper bracket retaining screws (see Fig. 2 and 3).

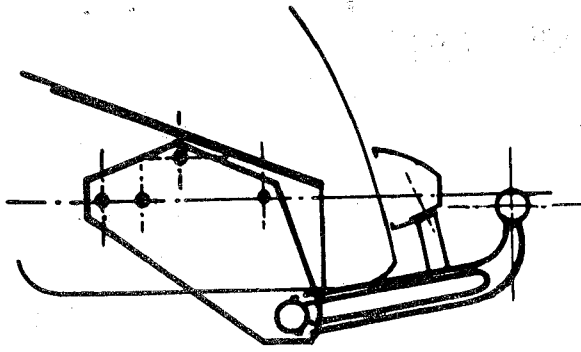


Fig. 2

6. Using an angle-head drill and a short drill bit of 12.5 mm (1/2 inch) diameter, drill the two additional mounting holes by using the mounting plate as guide.

7. Drill the holes on the opposite side of car.

Note:

The topmost mounting hole can be marked with a center punch and drilled from within the engine compartment.

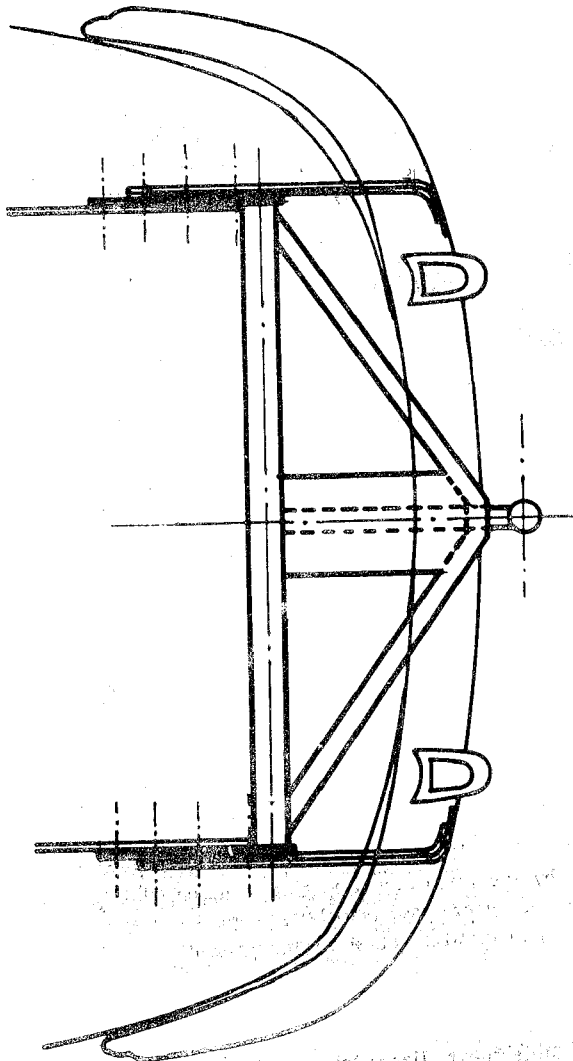


Fig. 3

8. Insert the mounting plate retaining bolts for both sides, together with the large washers which are supplied with the hitch kit, insert lock-washers, and tighten with nuts, then secure with a second nut to lock.

9. Remove bracket retaining bolts (used for aligning plate for drilling).

10. Loosen bumper bracket retaining bolts at bumper and reset brackets by the width of mounting bracket thickness (approx. 5 mm or .2 inch). If necessary, lengthen mounting holes in bumper brackets.

11. Guide bumpers, together with brackets, into openings in the body. Attach license plate illumination cable according to color code.

12. Insert bumper bracket retaining screws through holes in brackets, together with washers and lock washers, and align bumper.

Make sure that the body does not rub against the bumper brackets. If necessary, enlarge bracket holes in the body, repainting worked surfaces to protect against rust.

13. Mark holes for bumper hitch support in bumper and drill to 8.5 mm (.32 in.) diameter.

14. Insert bumper reinforcing plate behind bumper and fasten the hitch support with bolts.

15. Tighten mounting plate and bumper bracket supporting bolts at body and bracket ends in bumper.

16. Install trailer light wiring.

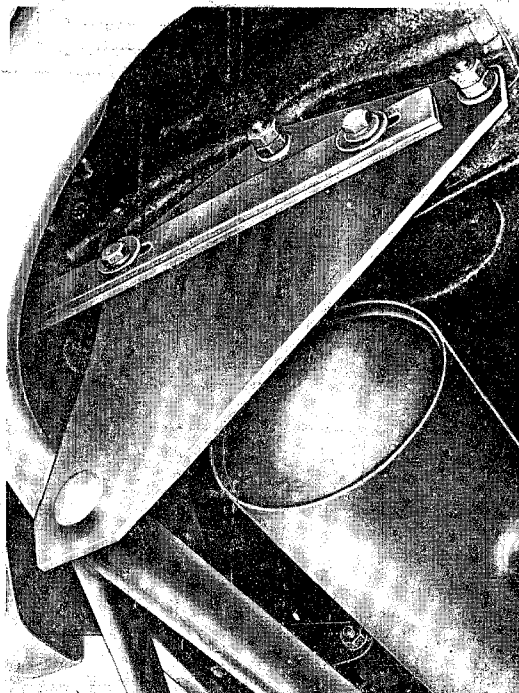


Fig. 4

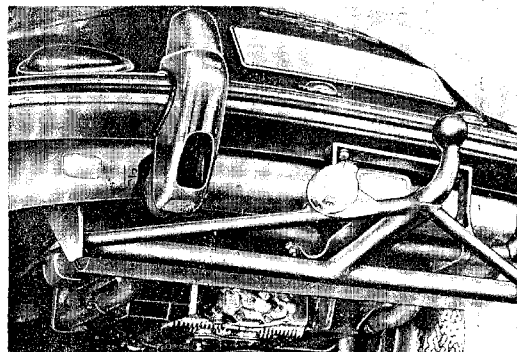


Fig. 5

Trailer Light Wiring

The following outline makes provision for the installation of a separate directional signal (blinker) control lamp on the instrument panel in driver's line of sight.

The system includes blinker lights and cable base manufactured by SWF, and the 5-terminal plug and socket by Hella.

It is always possible to utilize components manufactured by other firms.

1. In place of the standard blinker flasher and base with terminal bar, connect the parts 6, 7, and 7a (see Wiring Diagram).
2. Install the separate (additional) blinker control lamp to the left of the combination instrument (see Point 5, Wiring Diagram).
3. The connecting cables for the trailer tail/ stop lights and license plate illumination should be connecting to the appropriate wires in the car, as shown in the Wiring Diagram.

Wiring Diagram

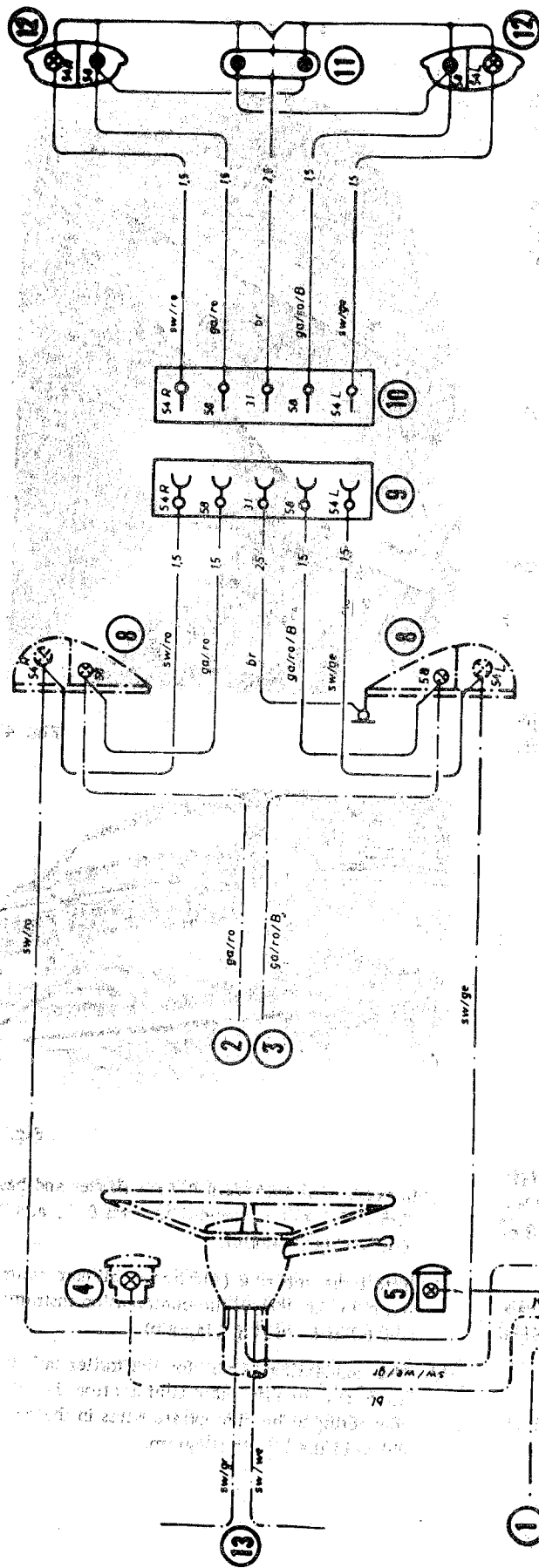


Fig. 6

- 1 Cable to Fuse 1
- 2 Cable to Fuse 7
- 3 Cable to Fuse 8
- 4 Blinker Control Light in Tachometer
- 5 Trailer Blinker Control Light (subsequently installed)
- 6 Terminal Bar (identical with WEKO 404 tr 4 pol.)
- 7 Blinker Flasher (identical with SWF BGDO 1)

sw = black
 we = white
 ro = red
 ga = grey
 br = brown

ge = yellow
 bl = blue
 gr = green
 B = with identification strip

- 8 Blink/Tail Lights on Vehicle
- 9 Car Socket (identical with Hella 12/5 A 5 pol.)
- 10 Trailer Plug (identical with Hella 12/5 B 5 pol.)
- 11 License Plate Illumination (on trailer)
- 12 Blink/Tail Lights on Trailer
- 13 Cables for Forward Blinkers

--- Original Cables in Car
 — New Cables Required