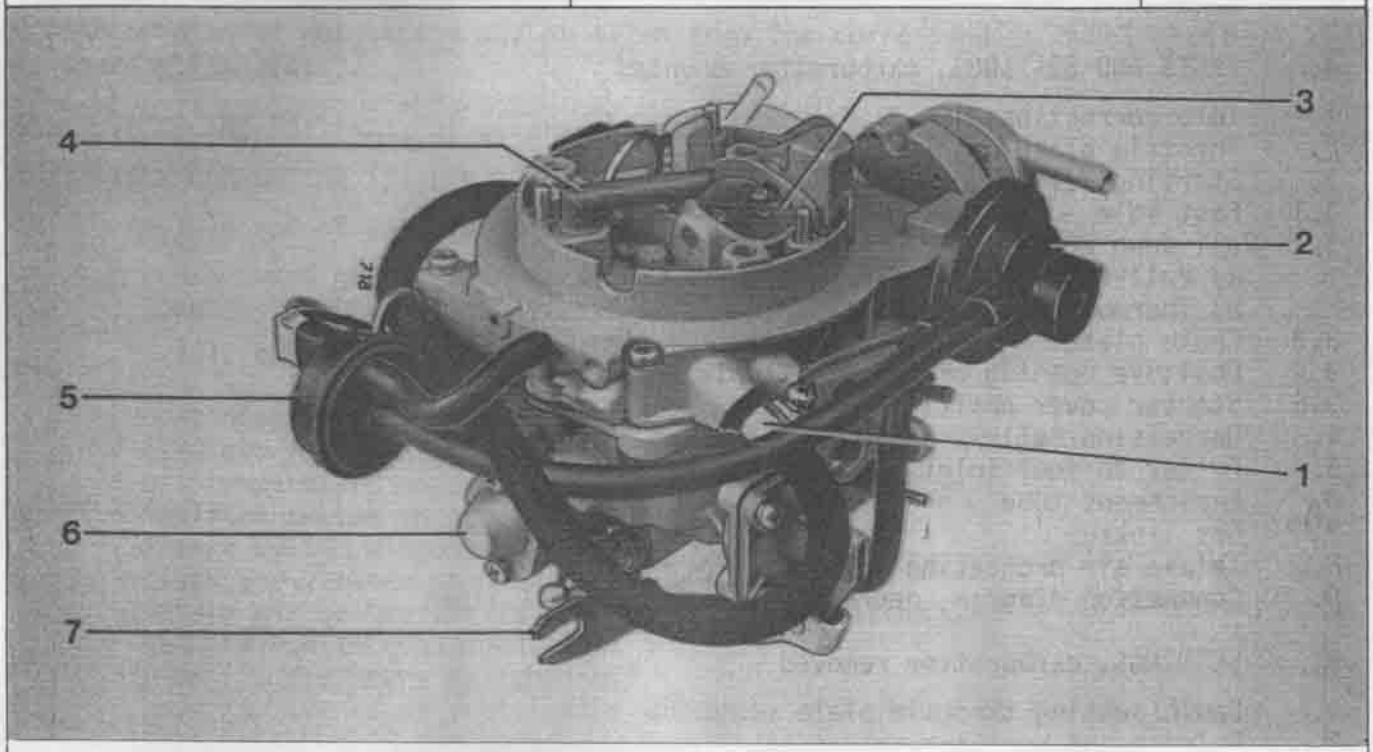
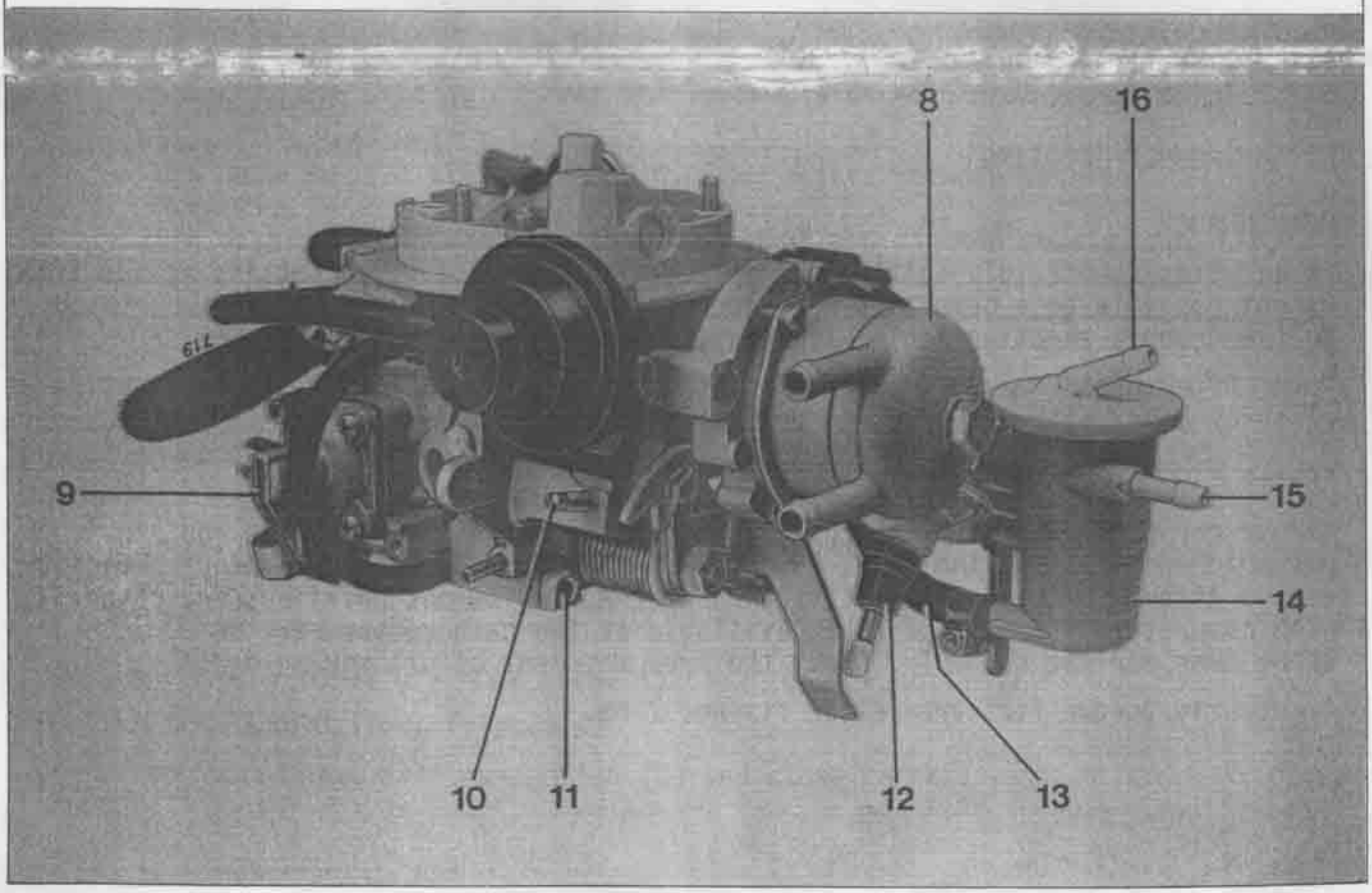
PIERBURG	SERVICE INSTRUCTION Vehicle: Opel Kadett E 13 S Carburetter: 2 E 3	4/1 08-36.1 E V1E3 10.84



1 Fuel inlet connection
2 Pull-down bellows
3 Float chamber vent tube
4 Float chamber vent tube
5 Thermo time valve
6 Part load enrichment
7 Throttle lever for AT vehicles
8 Starter cover
9 Accelerator pump
10 Thorttle plate abutment screw
11 Mixture control screw
12 Throttle plate dash-pot
13 Fuel hose to connection (1)
14 Vapor separator
15 Fuel inlet connection from fuel pump
16 Fuel return connection



CONTENTS

MAINTENANCE

If necessary check idle setting and if necessary correct. If a setting as specified is not possible or a complaint has been received check the carburetter according to the trouble shooting table, if necessary remove and repair.

Note: After engine washing protect the carburetter from corrosion by application of spray BREAK FREE CLP or WD 40 or Uni-Spray Termal.

REPAIR

Remove carburetter, clean externally and disassemble. Clean castings and steel parts in special cleaning bath, rewash with test fuel DIN 51 632. Before cleaning remove filter in the fuel inlet, see chapter A.5. Blow out drillings and channels with compressed air. A repair kit available at the carburetter service outlets has to be used for the assembly. Check the free movement of all moving parts.

Tightening torque for carburetter fixing: 7 Nm.

NOTE

Screws protected by means of protective caps or protection lacquer may not be reset. In case these screws have been maladjusted perform the setting according to the chapters in question. After the setting replace the protection.

Setting data if not listed may be taken from the corresponding model sheets (spare parts lists).

A. TESTS AND SETTINGS, carburetter mounted

1. IDLE CORRECTION (figure 1, 2)

Idle rpm of vehicles with

4/5 speed gear : 900 to 950 rpm
automatic transmissions: 800 to 850 rpm

idle emission value : 1.0 to 1.5 vol.-% CO

Conditions:
- flawless functioning of the engine
- oil temperature approx. 70 °C
- ignition system in good condition
- intake system without leakages
- clean air cleaner mounted
- intake air preheating in good operating condition
- gas linkage in good condition
- electric consumers switched-off
- hose for crankcase ventilation withdrawn and closed to the air cleaner
- test instruments connected
- the adjusting screw (3) may not touch the cam (4), see figure.
- with automatic transmission selector lever on "P".

- set idle rpm by means of the throttle plate abutment screw (1).
- correct emission value if necessary by means of the mixture control screw (2)

Remark: If this setting is not possible, see "trouble shooting table".

2. THROTTLE PLATE DASH-POT (figure 3)
(Only vehicles with automatic transmission)

lift "H" = 3.0 ± 0.5 mm

Condition: Idle setting correct and lever (1) in idle position.

- Release counter nut (3).
- Turn dash-pot (2) till a gap of 0.05 mm exists between dash-pot (2) and lever (1).
- Turn dash-pot (2) by 2 1/2 turns downwards and tighten counter nut (3).

3. STARTING DEVICE

3.1 Fast idle (fifure 4)

Conditions: Engine at operating temperature, idle correctly set.

- Place adjusting screw (3) on the second highest step of the cam (4).
- Start engine without depressing the accelerator pedal.
- Correct fast idle rpm with fully opened choke plate by means of the adjusting screw (3).

3.2 Pull-down device

Conditions: Hoses and hose connections in good condition.

a) Pull-down bellows (figure 5)

- Withdraw hose from connection (2) and close connection.

- Connect manual vacuum pump as shown and create pressure differential (approx. 300 mbar) in the pull-down bellows (1).
- If a pressure differential drop is noted, remove leakages.

b) Thermo time valve (figure 6)

below approx. + 28 °C = valve has passage
above approx. + 35 °C = valve closed

Conditions: Thermo time valve (3) at a stabilized temperature of approx.+20 °C
Good current supply at the plug (4) when the ignition is switched on, minimum 11.5 V.

- Connect ohmmeter according to illustration.
  Nominal value: at 20 to 30 °C = 6 ± 1.5 Ω
- Connect manual vacuum pump as shown in the illustration and actuate pump.
  The thermo time valve must have passage.
- Switch on the ignition, connect the plug (4) on the thermo time valve (3) and determine by continual actuation of the manual pump the switch over time (till the pressure differential increases).
  Switch over time at + 20 °C = 4 to 10 seconds
- If necessary replace thermo time valve.
- Connect hoses as shown in figure 7.

3.3 Choke plate

Conditions: Pull-down device in good condition according to chapter 3.2.
Starter cover removed.

- Make sure that when the choke plate is in starting position, the throttle plate is completely closed. If necessary check and if necessary set the clearance "A" (figure 8) between the diaphragm rod (2) and the lever (3).

a) Adjustment of clearance "A" (figure 8)

- Lift throttle plate, push intermediate lever (1) in direction of arrow and again release throttle plate. The adjusting screw (4), figure 91, rests on the highest step of cam (5).
- Check clearance "A", if necessary correct by bending lever (3), figure 8.

Clearance "A": 0.0 to 1.0 mm

b) Choke plate gap "a1" (wide) (figure 9a, b, 10)

- Close choke plate and place the adjusting screw (4) on the highest step of the cam (5).
- Create pressure differential in the pull-down device, see chapter A.3.2a figure 5.
- Push intermediate lever (1) lightly in direction of arrow and check gap according to figure 9b.
- Correction by means of the adjusting screw (6) figure 10.

c) Choke plate gap "a" (small)

Adjust with carburetter removed according to chapter B. 4.2.b.

3.4 Positive opening of choke plate (wide open kick) (figure 11 a, b)

- Lightly push intermediate lever (1) in direction of arrow and hold in that position, eventually use elastic ring.
- Place throttle lever in full load position and check opening of choke plate according to figure 11 b.

Opening too small:
Increase gap "B" of the segment (2) by means of screw driver

Opening too wide:
Decrease gap "B" of the segment (2) by means of pliers.

3.5 Starter cover position (figure 12)

- The markings (arrows) must be in line.

4. DEPRESSION BELLOWS STAGE II (figure 13)

- Connect manual vacuum pump according to illustration and create pressure differential.
- If pressure differential drop is noted the depression hose or the depression bellows is defective.
- If necessary replace.

5. FILTER IN THE FUEL INLET (figure 14)

Before cleaning the carburetter the filter (arrow) has to be removed.
The filter may be withdrawn by means of an M3-screw which is turned into the opening by 5 mm.
The filter has to be replaced.

6. ENRICHMENT TUBE (figure 15)

The discharge of the enrichment tube (1) is directed vertically into the center of the diffuser (2).

Height above diffuser: 27.5 ± 1.0 mm

7. GAS LINKAGE

- Adjust gas cable in idle position of the throttle lever without tension (light clearance in the gas cable).

8. INTAKE AIR PREHEATING (figure 16)
Intake air controlled as function of load and temperature

When the engine is cold (approx. -20 °C of the wax element (13)) the control flap (14) must completely close the cold air channel (A). Eventually check by means of cold spray.

With running or warming-up engine the warm air channel (B) must be closed.

When these positions are not reached the bimetal regulator (11) or the wax element (13) or the depression bellows (12) are defective.

9. CONNECTION DIAGRAM, depression lines and fuel lines (figure 16)

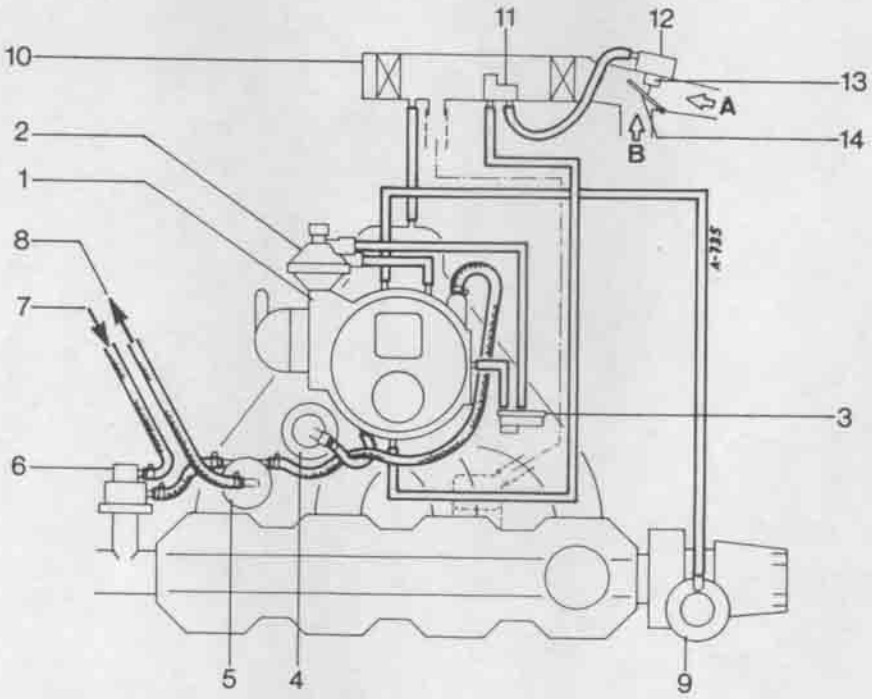


Figure 16

A cold air supply
B warm air supply
1 carburetter
2 pull-down bellows
3 thermo time valve
4 depression bellows stage II
5 vapor separator
6 fuel pump
7 fuel supply
8 fuel return
9 depression bellows, ignition distributor
10 air cleaner
11 bimetal regulator
12 depression bellows
13 wax element
14 control flap

B. SETTINGS, carburetter removed

The measuring and control devices mentioned below may be purchased from our local general agent.

1. BASIC SETTING
CHOKE PLATE STAGE II (figure 17, 18)

- Turn out throttle plate abutment screw (1) till it is no longer in contact.
- Place measuring device (2) in position and set measure "a" by means of throttle plate abutment screw (1).

2. RELEASE AND POSITIVE RETURN OF STAGE II (figure 19)

Condition: Throttle plate stage I in idle position.

a) Opening point "Y"
- set distance (Y) by bending fork (1).

b) Closing point "Z"
- Set distance (Z) by bending fork (1).

Important: Measure at the smallest opening.

3. PULL ROD FOR STAGE II (figure 20)

Conditions: Chapter B.1. and B.2. correct.

- Unhook ball cage (1) and check pretension "b".

  Nominal value: 0.5 to 2.0 mm

- If necessary replace depression bellows stage II.

4. STARTING DEVICE

4.1 Leakage test of pull-down bellows (figure 21)

Conditions:

- Starter cover removed and adjusting screw (4) figure 22 a on highest step of cam (5).
- Vacuum tester (2) connected as shown in figure 21, control valve (3) closed.
- Hold choke plate closed by depressing lever (1) and create pressure differential of approx. 750 mbar. (Overpress pull-down).
- Cut off vacuum tester and perform leakage test. In case of pressure differential drop replace pull-down bellows.
- Release lever (1) and close connection (7) by means of a cap (8).
- Create pressure differential (approx. 750 mbar).
- Cut off vacuum tester and perform leakage test. In case of pressure differential drop replace pull-down bellows.

4.2 Choke plate (figure 21-23)

Conditions: See chapter B.4.1.
Place screw (4) figure 22a on highest step of cam (5). Clearance "A" figure 8 correct.

a) Gap "a1" (wide)

- Close connection (7) by means of cap (8) and create pressure differential (approx. 750 mbar).
- Push lever (1) lightly in direction of arrow and check gap according to figure 22b. Correction by means of screw (6) figure 23.

b) Gap "a" (small)

Checking and adjustment only required if the color protection (10) has been damaged and after the pull-down bellows has been replaced respectively.

- Remove cap (8) from connection (7) and switch on vacuum testing device.
- Create a pressure differential of approx. 200 mbar by depressing the lever in direction of arrow and check gap according to figure 22b, correction by means of screw (9) figure 21.
- Mount starter cover and align markings.

4.3 Position of cam (figure 24, 25)

Condition: Adjustments chapter B.4.2. correct.

- Place screw (4) on the highest step of cam (1).
- Close connection (7) figure 21 by means of cap, connect vacuum testing device (2) figure 21 as shown and create pressure differential.

- Lightly push lever (3) figure 24 in direction of arrow, open throttle plate and close again.
  Screw (4) must rest on second highest step of cam (1) for gap "a", see figure 24b.

  "a" = 0.0 to 1.0 mm

- Correction by bending lever (2) figure 24b and 25.

Important: Make sure that the return springs, arrows figure 25, are in the correct position.

4.4 Cold starting adjustment, throttle plate gap (figure 26)

- Place adjusting screw (1) on highest step of cam (2).
- Measure throttle plate gap (arrow) according to figure 26.
- Correction by means of adjusting screw (1).

Note: Check fast idle rpm after the carburetter has been mounted, if necessary correct, see chapter A.3.1.

5. FLOAT / LEVEL (figure 27, 28)

- Remove carburetter cover.
  When remounting the cover make sure the spring (arrow) figure 29 is in the correct position.
- Check height "h" and the float weight.

Important: The valve pin (1) of the float needle may not be depressed by the float weight when the height is measured.

The fuel level cannot be adjusted. It results by using a flawless float.

- Make sure that the float (2) with float needle, see figure 28, is correctly mounted.

6. ACCELERATOR PUMP

6.1 Direction of injection spray (figure 30)

- Insert (press fit) injector tube so that the fuel spray is in direction of recess (arrow).

6.2 Injection volume (figure 31)

Conditions: The fuel chamber must have a normal fuel level during the measurement i.e. the fuel must be replenished.

The injection must begin immediately upon actuation of the throttle plates.

- Use carburetter testing device.
- Turn cam (4) figure 2 and hold cam so that the adjusting screw (3) does not contact.
- Uniformly completely open and close 10 times throttle plate (approx. 1s/ stroke). Wait for approx. 3 s between the strokes.
- Divide fuel quantity by 10 and compare with the nominal value.
- Correct injection volume by untightening clamping screw (1) and turning cam (2).
  In direction + greater injection volume
  in direction - smaller injection volume

  Attention: In vehicles with automatic transmission the throttle plate dashpot (2) figure 3 has to be turned upwards before the measuring is effected.

TROUBLE SHOOTING TABLE - 2E3-OPEL

4/1 08-36.1 E

COMPLAINTS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Cold starting (firing)	•		•		•				•	•				•	•										•			
Stabilization of engine run (stalling after cold starting)	•		•		•					•	•	•		•	•								•		•			
Cold idle (engine speed too high / too low)			•	•	•	•				•	•	•	•	•	•		•	•			•		•		•			
Cold drive away, progression cold (bad response, bucking)			•	•	•	•				•	•	•	•			•	•	•		•					•			
Automatic starter does not cut out completely or too late										•			•	•														
Warm starting (starting time more than 5 s)	•		•		•			•															•	•	•			
Idle (rough, too high, too low)			•		•	•		•						•			•	•			•		•	•	•		•	
Idle rpm or CO too high (not adjustable)			•		•	•		•						•				•	•		•				•		•	
Progression during acceleration (bucking)					•	•	•											•	•		•	•			•		•	
Progression at high rpm (to stage II)					•		•													•							•	•
Exhaust detonations during deceleration							•											•	•	•					•			
Power (too small, stalls at full load)				•	•		•						•								•	•		•		•	•	•
Excessive fuel consumption			•	•		•		•			•		•	•	•			•	•		•	•	•	•				

NOTE:

This table should only be used if the following conditions are met:

- Good functioning of the engine (timing, valves etc...)
- Ignition system in good working order and correctly set
- Intake system without leakages
- Exhaust system in good working order
- Correct control of intake air preheating
- Clean air cleaner
- Correct fuel pressure to the carburetter

	CAUSE	REMEDY
1	Incorrect operation	operate as specified
2	Working conditions / driving error	service discussion with client
3	Fuel not according to standard	use fuel according to standard
4	Carburetter icing	use fuel according to standard / check preheating
5	Dirt in the carburetter / damage by water	clean carburetter, if necessary replace
6	Worn throttle spindle	replace carburetter
7	Jet setting not as specified	correct
8	Fuel evaporation (engine excessively rich)	hold accelerator pedal in full load position and start / try changing fuel
9	Choke plate does not completely close	adjust starting device / check bimetal spring
10	Choke plate or linkage hard moving or jamming	assure free movement
11	Choke plate gap incorrect	adjust
12	Pulldown device leaks or is defective	check, if necessary replace parts
13	Starter heating incorrect or cooling water flow disturbed	check heating coil, contacts and cooling water flow
14	Cam jams; incorrect position; return springs defective	assure free movement and adjust, if necessary replace carburetter cover
15	Cold starting adjustment, throttle plate gap incorrect	adjust fast idle and throttle plate gap respectively
16	Positive choke plate opening (wide open kick) incorrect	adjust
17	Idle adjustment incorrect	correct
18	Idle fuel-air jet contaminated	clean and replace respectively
19	Throttle plate dash-pot jams or is incorrectly adjusted	replaceand adjust respectively
20	Injection volume and begin of injection respectively	check, if necessary replace
21	Enrichment valve defective	replace
22	Enrichment tube incorrect, bend	check, if necessary adjust
23	Float needle valve leaks	clean valve, if necessary replace needle
24	Float defective / incorrect level	replace float
25	Erroneous air on gaskets or flange	replace gaskets
26	Throttle plates do not completely open	correct gas linkage
27	Basic setting throttle plate stage II incorrect	adjust
28	Depression bellows stage II incorrect; pull rod incorrect	replace and if necessary adjust

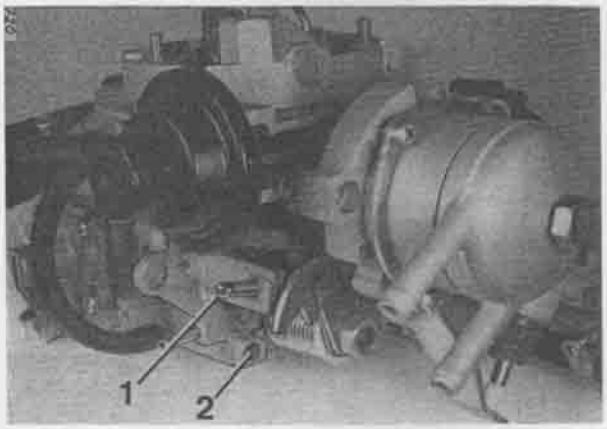


fig. 1

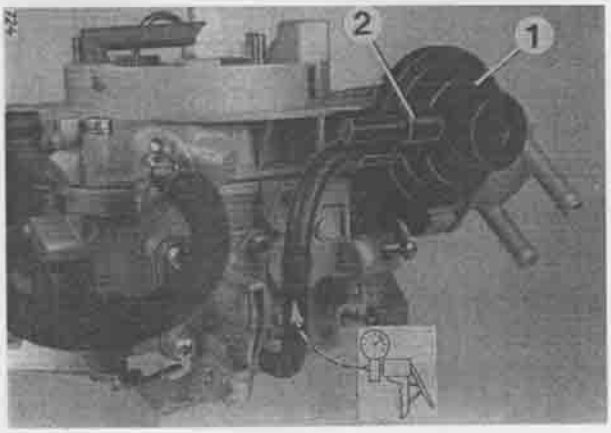


fig. 5

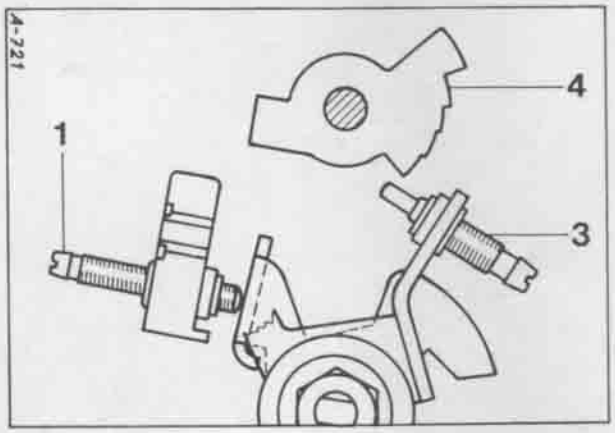


fig. 2

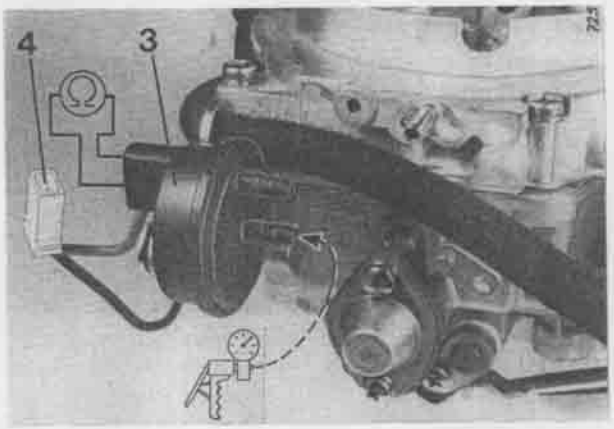


fig. 6

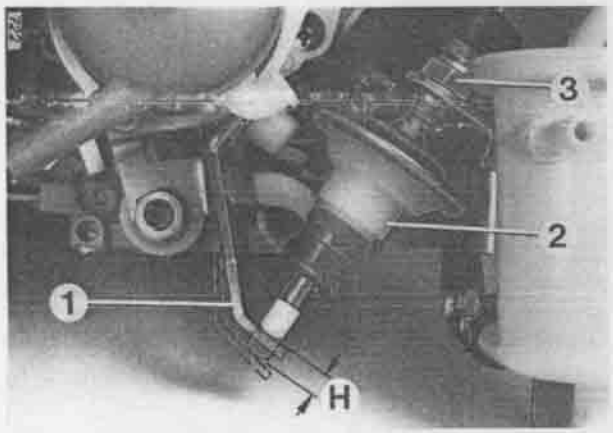


fig. 3

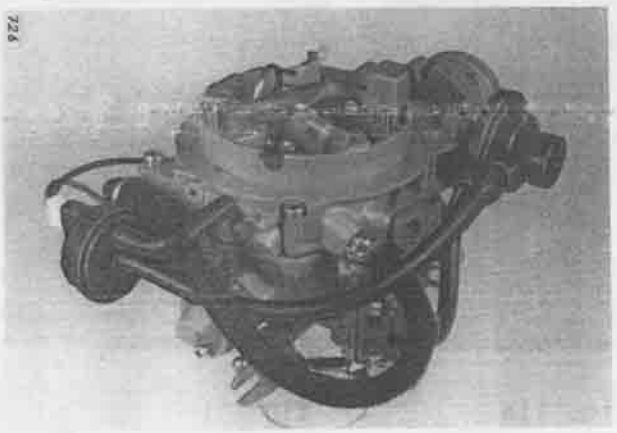


fig. 7

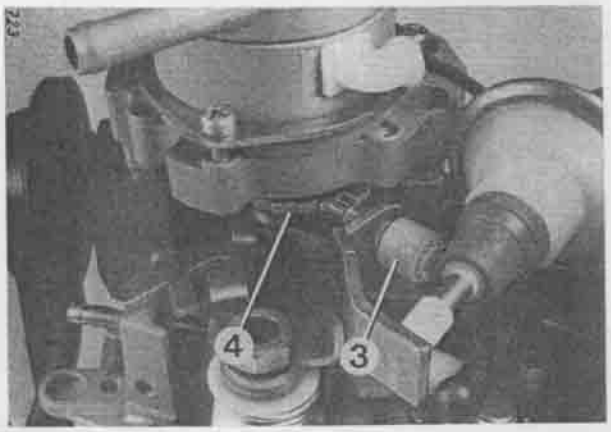


fig. 4

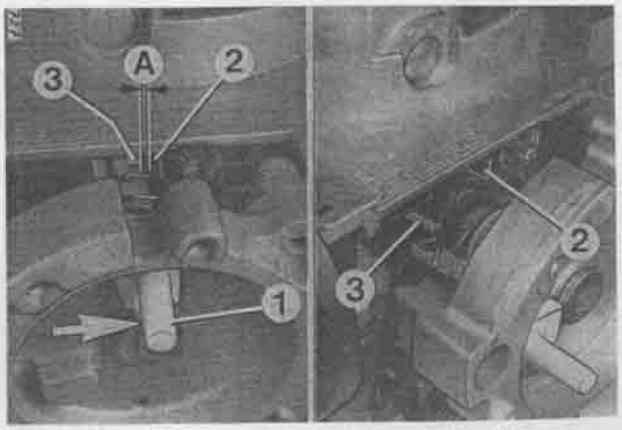


fig. 8

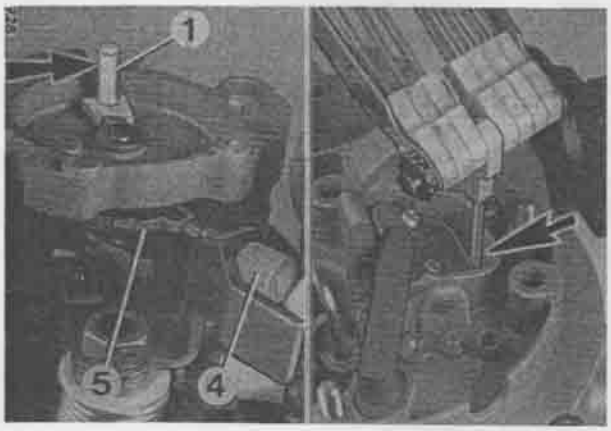


fig. 9a

fig. 9b

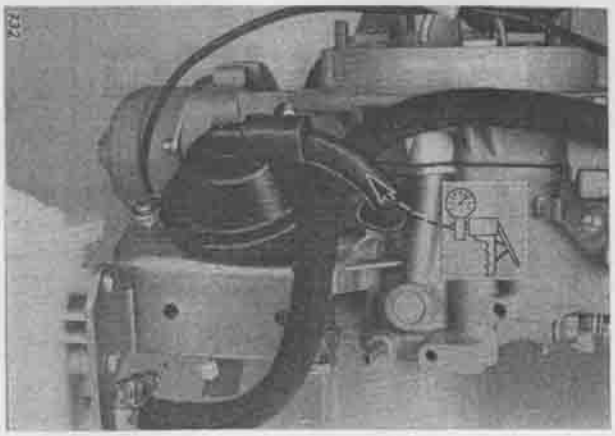


fig. 13

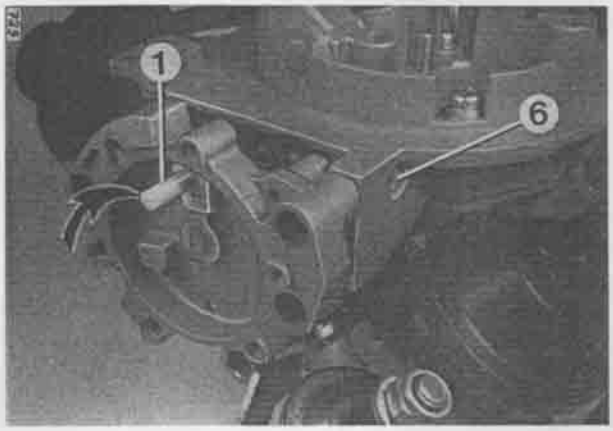


fig. 10

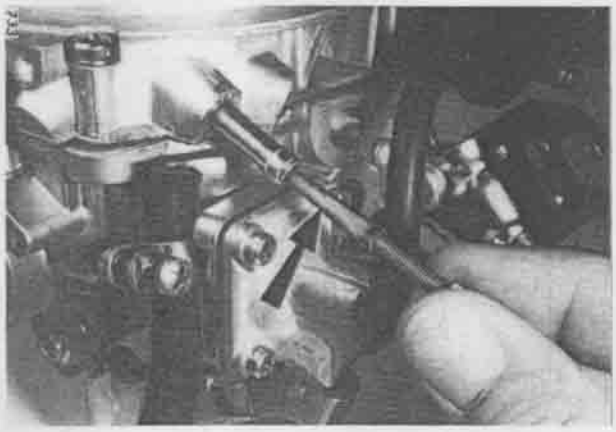


fig. 14

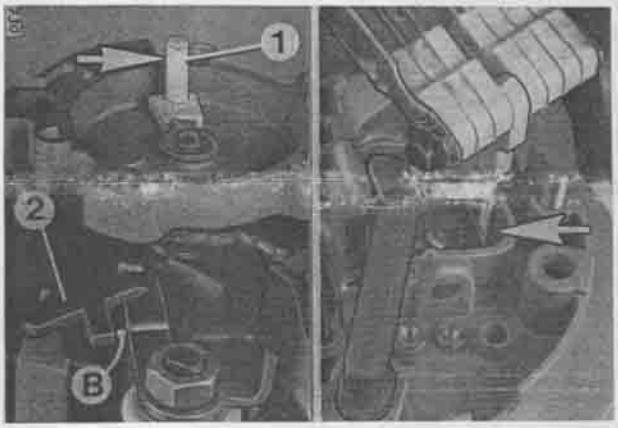


fig. 11a

fig. 11b

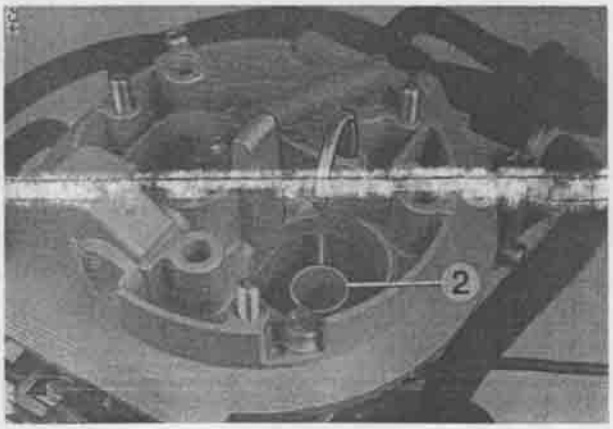


fig. 15

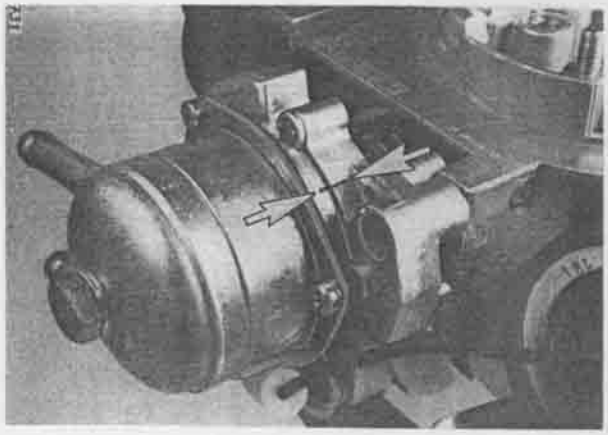


fig. 12

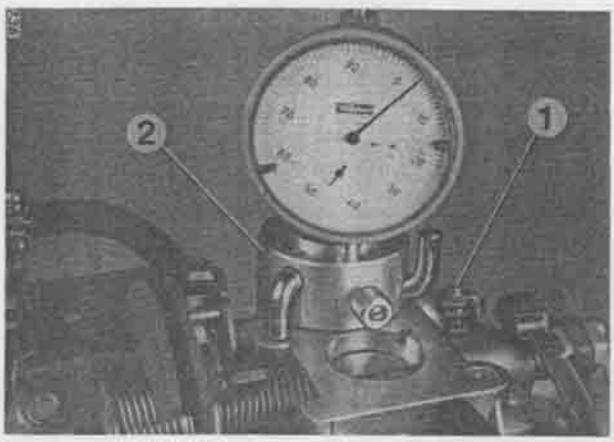


fig. 17

fig. 26

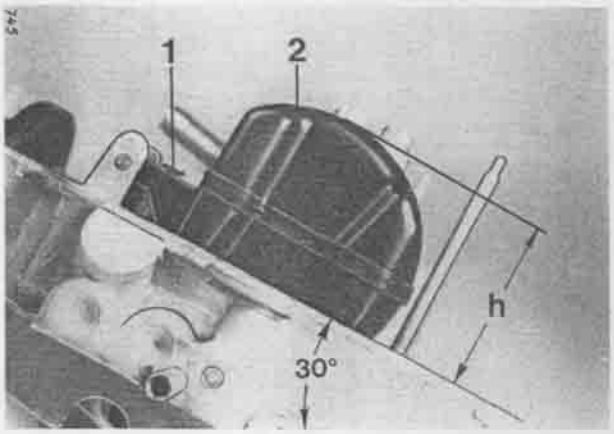


fig. 27

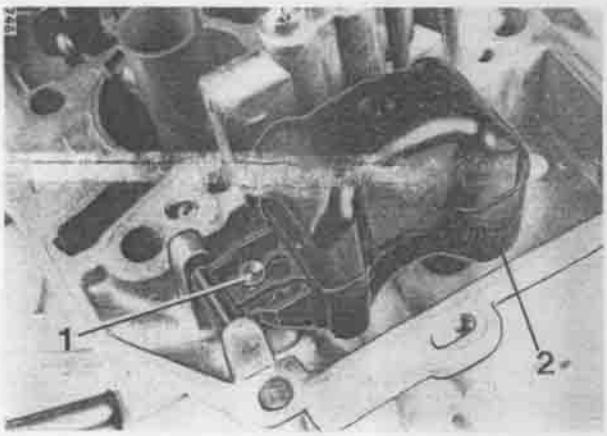


fig. 28

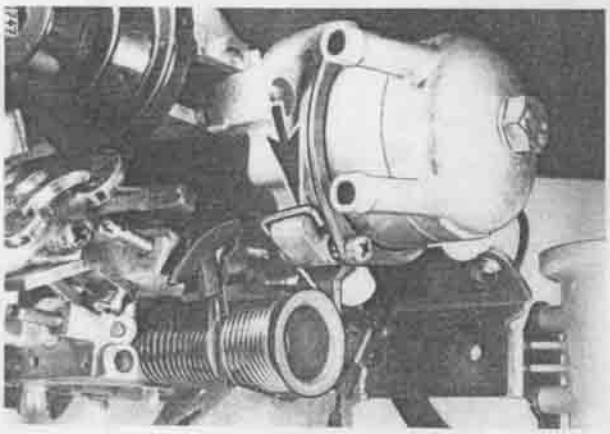


fig. 29

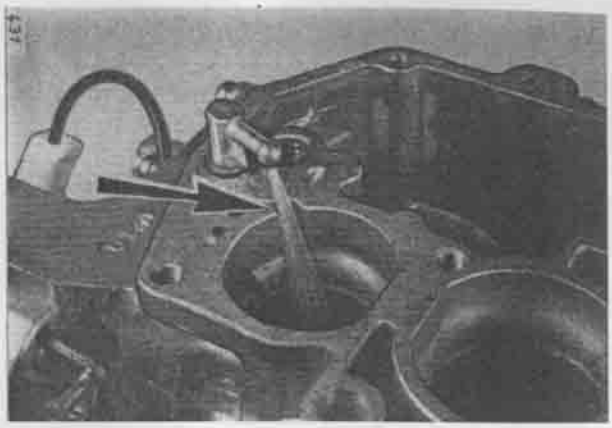


fig. 30

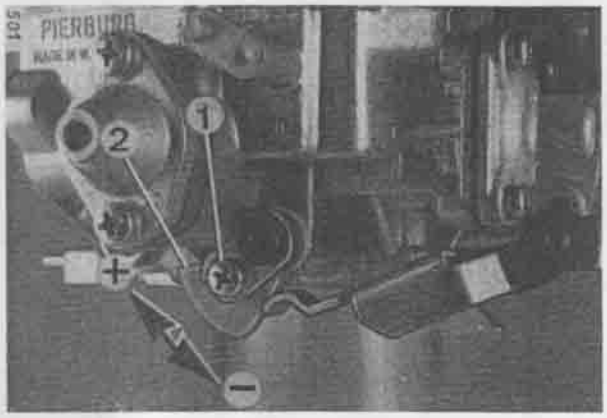


fig. 31