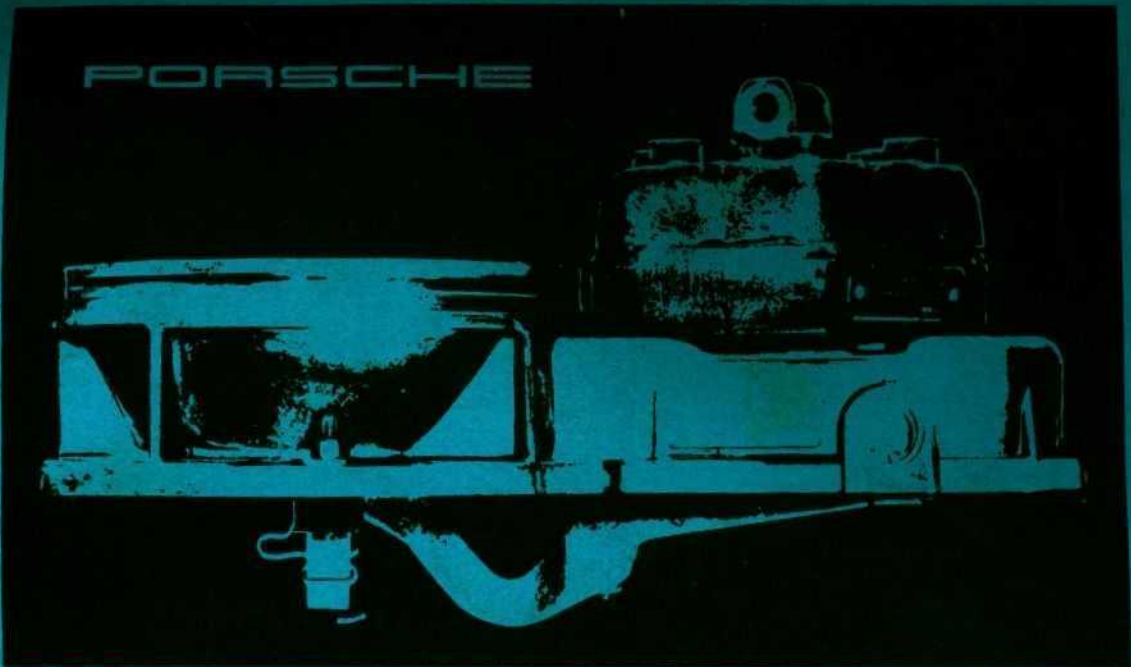


PORSCHE



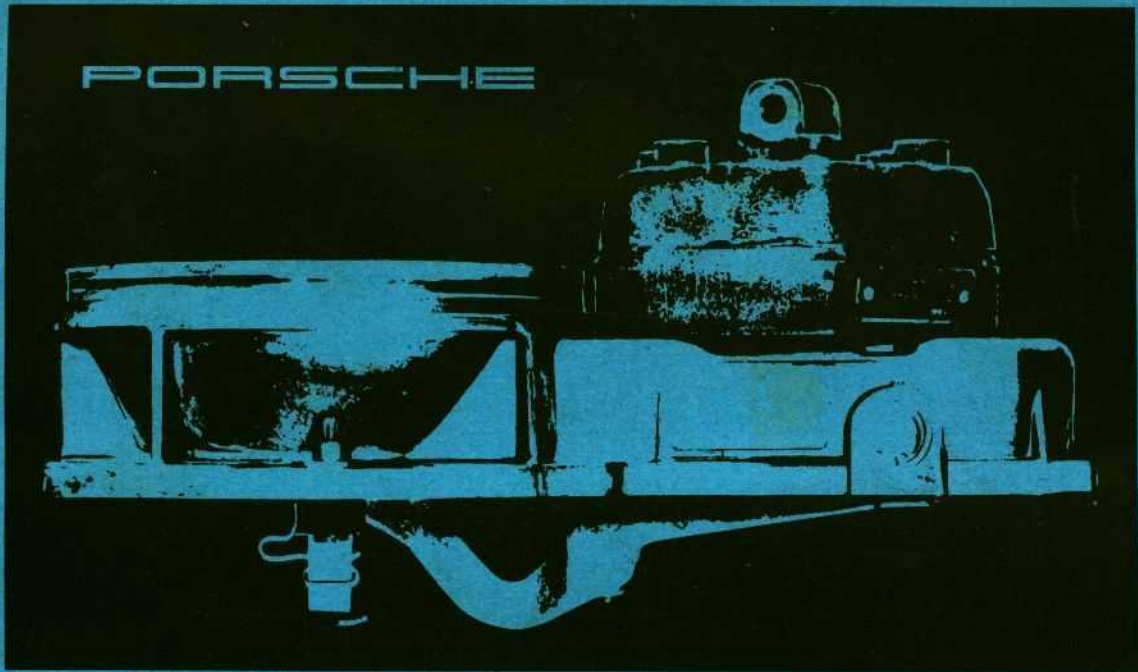
TROUBLESHOOTING
GUIDE **K-JETRONIC**

II

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PORSCHE



**TROUBLESHOOTING
GUIDE K-JETRONIC**

II

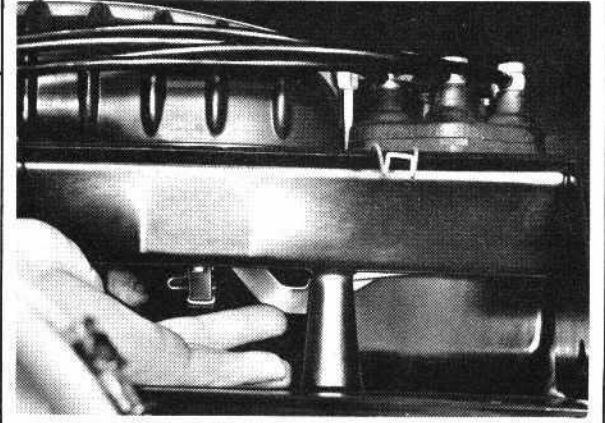
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K-Jetronic (CIS) Troubleshooting Guide

Contents:	Engine fails to start (cold or warm) _____
	Cold-start problems _____
	Hot-start problems _____
	Improper idle _____
	Uneven running _____
	Unsatisfactory performance _____
	Fuel consumption too high _____
	Appendix _____

Note: All instructions marked * apply only to vehicles up to and including the 1975 model.

ENGINE FAILS TO START (cold or warm)

Possible cause	Diagnosis	Repair procedure
	<p>Start engine</p> <p>END</p> <p>Sensor plate or control piston not moving freely</p> <p>Check sensor plate and control piston for smooth movement</p>	<p>Replace fuel pump.</p> <p>Check leads and connections. Eliminate faults.</p> <p>Turn ignition off. Remove air filter breather with plate filter and lift sensor plate lever from below. Resistance must be uniform throughout lever travel. On rapid downward movement the slow movement of the control piston lifts it away from the lever; there must be no noticeable resistance, however.</p> 
	<p>Intake air system leaking</p> <p>Check tightness of intake air system (vacuum system). See Technical Information Gr. 2, No. 3 dated 5.7.75</p>	<p>Sensor plate and control piston move freely</p> <p>throughout lever travel.</p> <p>Remove control piston, polish carefully in this area with crocus cloth</p> <p>Sensor plate and control piston do not move freely</p> <p>heavy movement at beginning only: sensor plate touches air venturi.</p> <p>Remove mixture control unit readjust sensor plate, see appendix for procedure.</p> <p>Start engine.</p> <p>adjust idling CO</p> <p>END</p> <p>Note: Only serious leaks cause the engine not to start, e. g. rubber bellows disconnected. With minor leaks the engine starts, but runs unevenly (see idling defects).</p>

ENGINE FAILS TO START (cold or warm)

Possible cause	Diagnosis	Repair procedure
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Sensor plate stop too low.

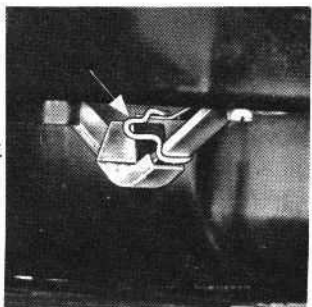
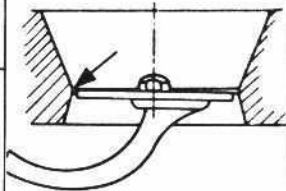
Start engine
Adjust idle and CO.
END

Remove rubber bellows between mixture control unit and throttle housing, check sensor plate position.

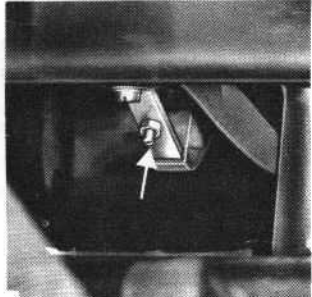
No leaks found.

Leaks found and eliminated.

Release pressure in fuel system. For this purpose loosen pressure fuel line connected to warm-up regulator at fuel distributor slightly to release remaining pressure. Wrap a rag around fuel line to trap excess fuel. The upper edge of the sensor plate must now be flush with the taper edge at the point shown in the diagram on the left.



If necessary, an adjustment can be made by bending the spring clip (arrow in figure above). From the 1977 model the adjustment is made by turning the screw shown (arrow in figure on right).



After adjusting, check sensor plate for free movement. Check sensor plate position under pressure: switch on fuel pump. The adjusted position of the sensor plate must not change by more than 0.5 mm. When control pressure is applied.

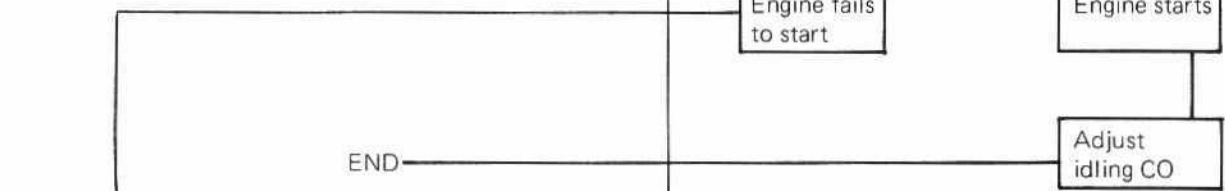
Change within tolerance limits.

Sensor plate position changes by more than 0.5 mm.

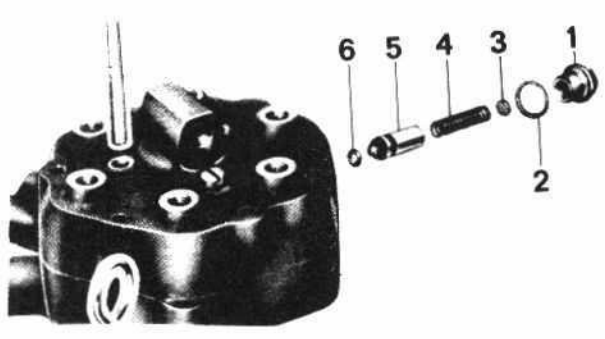
Replace flat spring on sensor plate stop. Adjust to zero position.

ENGINE FAILS TO START (cold or warm)

Possible cause	Diagnosis	Repair procedure
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Important:
 To prevent dirt from entering the system, all connections which have to be removed must first be cleaned thoroughly.
 The pressure gauge is connected between the fuel distributor and control pressure line.
 The control pressure now runs from the fuel distributor through the two-way valve of the pressure gauge to the warm-up regulator and throttle valve.
 All pressure tests can be carried out in this way without reconnecting the tubes.
Note: calibrate pressure gauge occasionally.



- 1. Screw cap
- 2. Sealing washer
- 3. Correction disc
- 4. Spring
- 5. Piston
- 6. O-Ring

Switch on ignition, from 76 model disconnect the air sensor contact; two-way valve to position 1.
 Read off system pressure.
 Nominal value 4.5 to 5.2 atm.



Engine fails to start

System pressure between 4.5 and 5.2 bar.
 The pressure should ideally be towards the upper limit.

System pressure not reached

Pressure regulating valve in fuel distributor unit leaking

Replace rubber sealing

ENGINE FAILS TO START (cold or warm)

Possible cause	Diagnosis	Repair procedure
----------------	-----------	------------------

Repeat system pressure test. Pressure should ideally be near upper limit. It can be increased by the addition of correction disc - 3 - in the system pressure control valve.

Start engine
Adjust idling CO
END

On vehicles prior to 75 model clamp off feed hose to cold start valve with hose clip to cut off fuel supply. From 75 model onwards, unscrew feed hose at cold start valve and close **tightly**.

Cold start device defective; engine floods

Check cold start valve for leaking

start engine

10

Defective auxiliary air valve (from 75 model). Cold engine starts then stops. The auxiliary air valve must be open when the engine is not running.

engine fails to start

engine starts

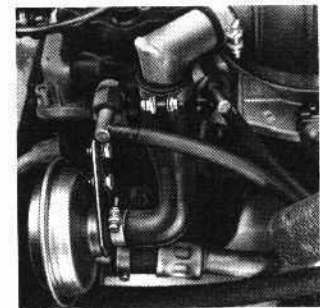
END

Adjust idling CO.

cold start valve leaks
replace cold-start valve

Check hose for kinks and that the auxiliary air valve is open.

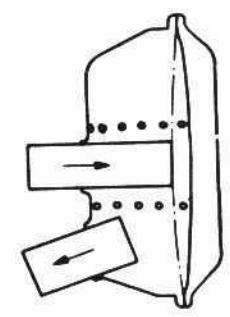
If no kinks in hoses, disconnect hoses from the auxiliary air valve and check that air can pass through the valve.



No air passage.

start engine
END

Renew auxiliary air valve.



11

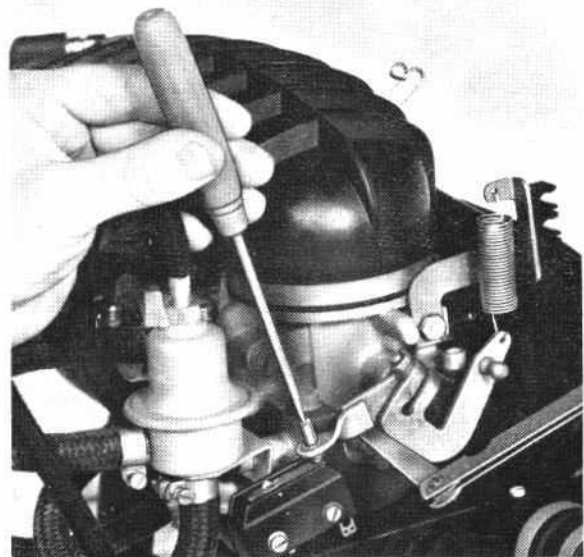
TYPICAL COLD-START PROBLEMS

Test conditions	Possible cause
<p>Battery voltage sufficient</p> <p>Valve clearance and mechanical condition of engine correct</p> <p>Ignition system in order</p>	<ul style="list-style-type: none"> *• Operating error *• Hand throttle wrongly set so that micro-switch fails to function • Starting valve fails to inject • Thermo-time switch or *micro-switch defective • Warm-up regulator defective • Auxiliary air slide

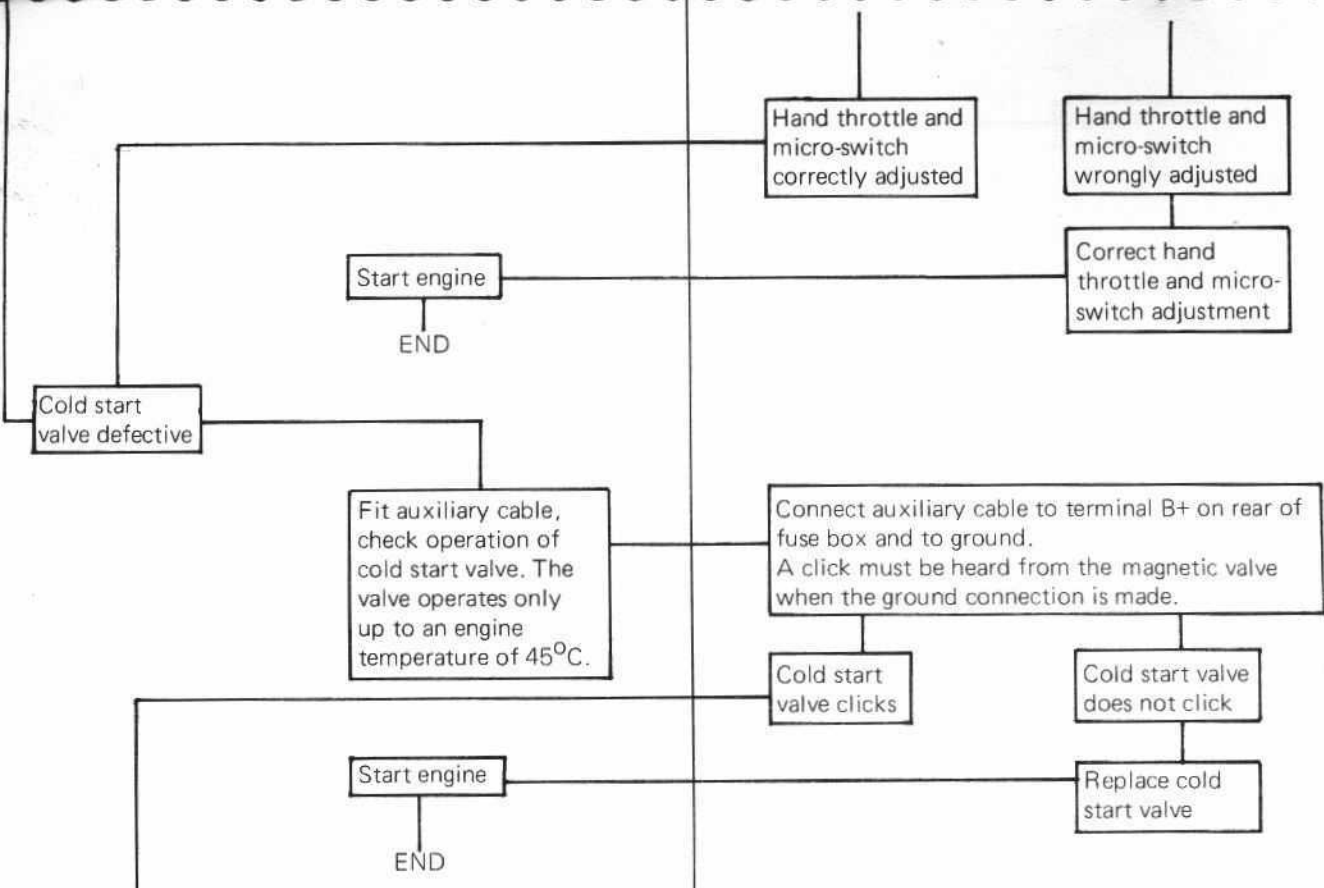
Possible cause	Diagnosis	Repair procedure
<p>Operating error</p> <p>Hand throttle wrongly adjusted so that micro-switch fails to function</p>	<p>Start engine according to operating manual *</p> <p>Engine fails to start properly</p> <p>Engine starts properly</p> <p>Inform customer of correct operation</p> <p>END</p> <p>Check hand throttle and micro-switch adjustment</p>	<p>Pull hand throttle lever to upper limit stop before actuating starter. If engine runs push back hand throttle lever until engine speed is approx. 2000 rpm.</p> <p>At temperatures of less than -20°C, operate the accelerator pedal a little, as well as the hand throttle lever to start the engine.</p> <p>Important: make sure hand throttle lever stays in pulled position (friction discs)</p> <p>Setting: oil temperature 80°C hand throttle lever pulled to an engine speed of 3500 to 3800 rpm</p> <p>Remove the electrical connections to the micro-switch and connect a buzzer between the micro-switch contacts. Move the throttle valve. Insert a 2 mm feeler gauge between the idling stop screw and the throttle valve lever.</p>

TYPICAL COLD-START PROBLEMS

Possible cause	Diagnosis	Repair procedure
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Caution
 This measurement must be exact, hence ensure that the guage is inserted flat.
 Screw in the adjustment screw on the throttle valve lever, beyond the switch-off point of the micro-switch (buzzer off). Turn back the adjustment screw to the switch-on point of the micro-switch (buzzer on). Close the throttle valve, and check that in this position the switch lever has sufficient return clearance (at least 0.5 mm).

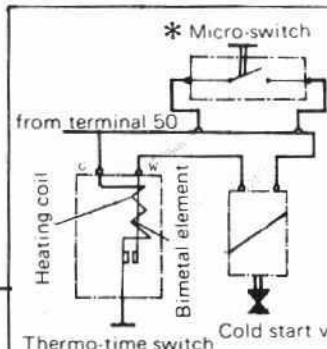


TYPICAL COLD-START PROBLEMS

Possible cause	Diagnosis	Repair procedure
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Thermo-time switch or micro-switch* defective

Check thermo-time switch and micro-switch* for current flow



No micro-switch fitted to 76 model onward.

Remove double plug from cold start valve. Connect test lamp to two plug contacts. Pull out hand throttle lever.* Start engine. During starting operation test lamp must come on at engine temperatures below $45^{\circ}\text{C} \pm 4^{\circ}\text{C}$.

Test lamp comes on
No defect present

Test lamp fails to come on
Defect in thermo-time switch or micro-switch*

Start engine

Repair defect

END

Warm-up regulator defective

Test control pressure "cold"

Connect pressure gauge
Set two way valve to position 2
Switch on ignition ++
Control pressure "cold" should reach values shown in adjacent graphs.

Control pressure correct

++ 76 model onwards, disconnect air sensor contact

Control pressure "cold" higher than shown in graph

Blockage in return line. Check return line for free passage

Passage in order

Passage not in order

Diagram for warm-up regulator
Part No. 911.110.027.00
911.606.103.00
Boch No. 0.438.140.001

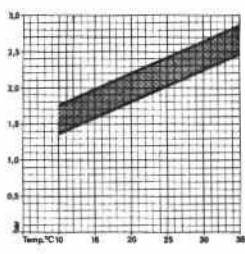


Diagram for warm-up regulator
Part No. 911.606.103.01
Boch No. 0.438.140.008

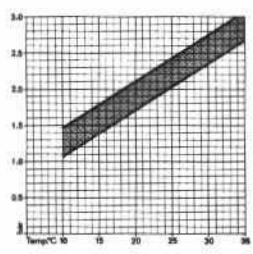


Diagram for warm-up regulator
Part No. 911.606.105.01
Boch No. 0.438.140.009

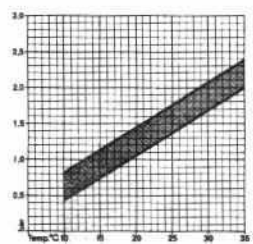
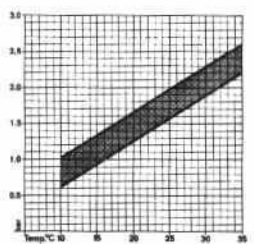


Diagram for warm-up regulator
Part No. 911.606.105.03
and 911.606.105.04
Boch No. 0.438.140.017
and 0.438.140.033



TYPICAL COLD-START PROBLEMS

Possible cause	Diagnosis	Repair procedure
	<p>Start engine</p> <p>Adjust idling CO</p> <p>END</p>	<p>Check return line junction piece</p> <p>Replace warm-up regulator After fitting new warm-up regulator test vehicle for smooth engine running Remedy: see uneven running</p> <p>Repeat control pressure measurement</p>

Defective auxiliary air slide (from 76 model). Cold engine starts then stops.

Check hoses for kinks and that the auxiliary air slide is open.

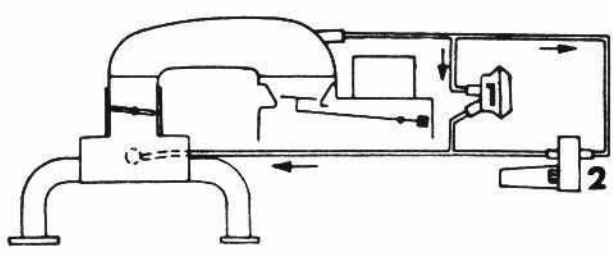
If no kinks in hoses, disconnect hoses from the auxiliary air slide and check that air can pass through the slide (only when cold).

No air passage

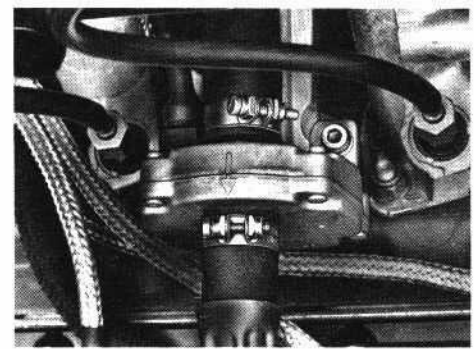
Start engine

END

Renew auxiliary air slide.



1 Auxiliary air valve
2 Auxiliary air slide

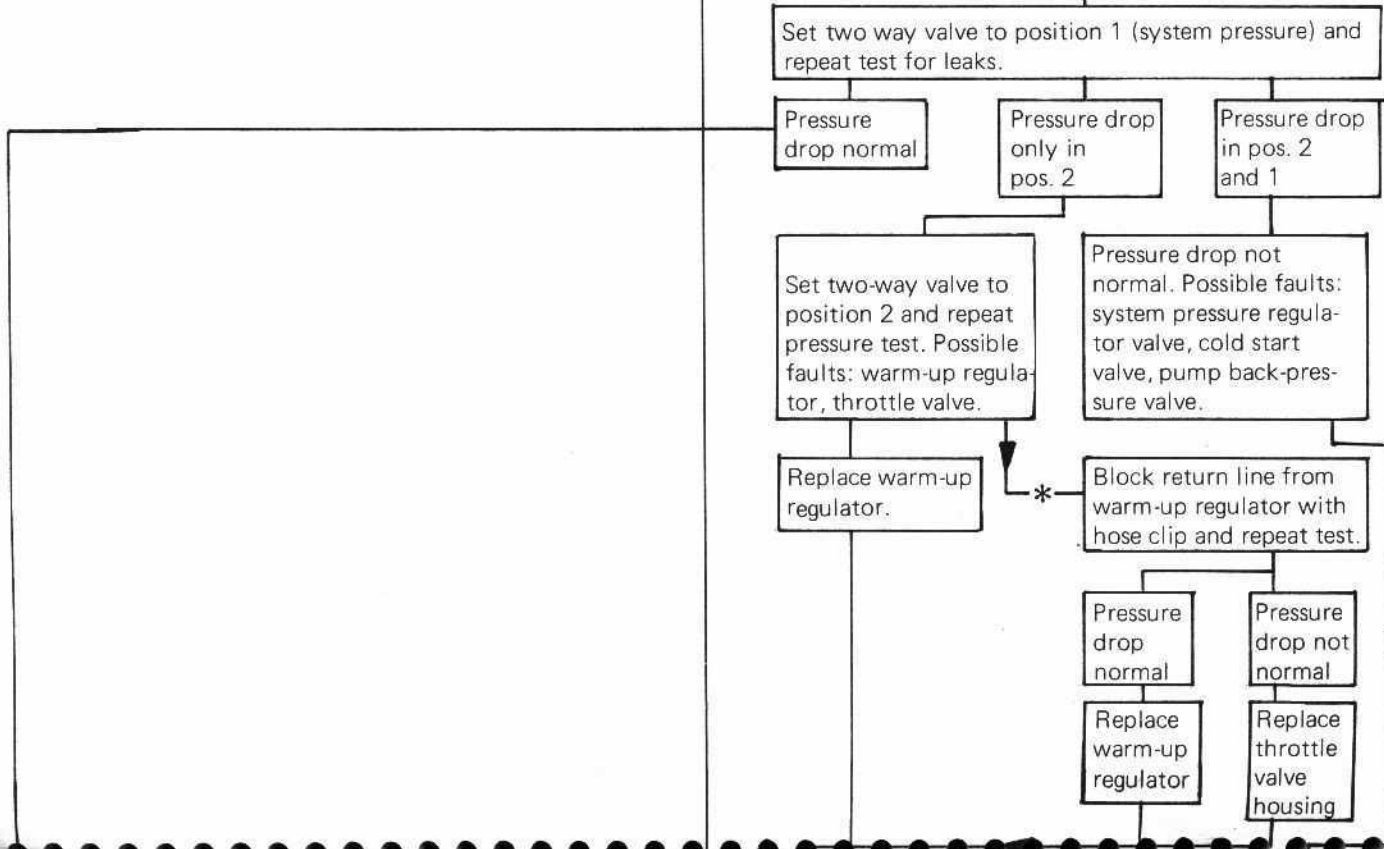


TYPICAL HOT-START PROBLEMS

Possible cause

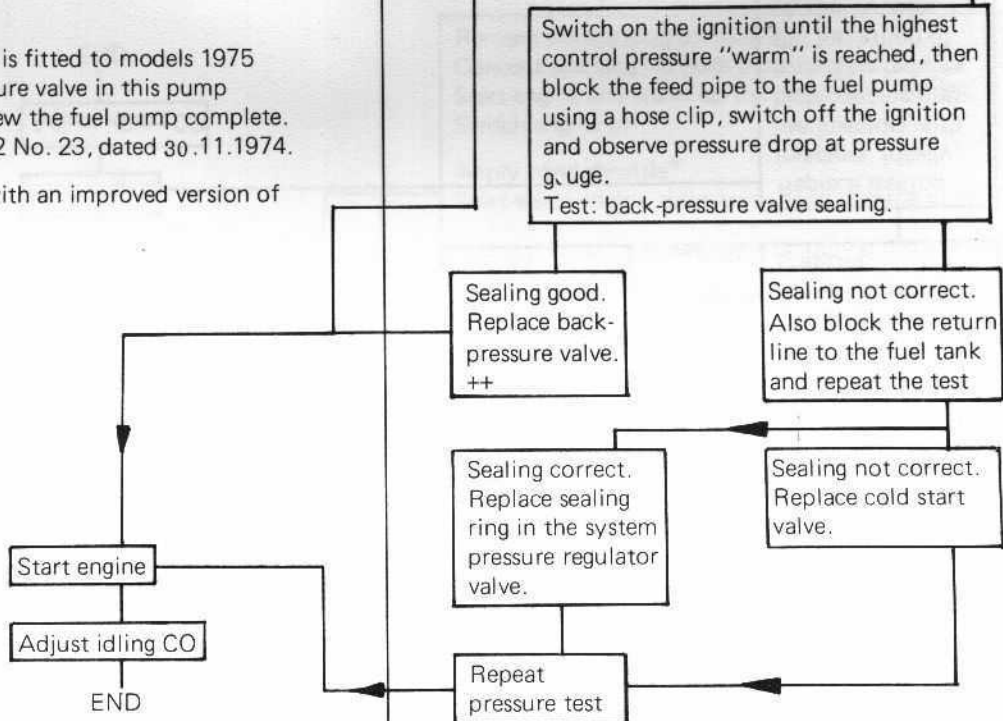
Diagnosis

Repair procedure



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++
Note: Fuel pump EKP 4 is fitted to models 1975 onwards. The back-pressure valve in this pump cannot be replaced. Renew the fuel pump complete. See also Tech. Info. Gr. 2 No. 23, dated 30.11.1974.
 Models 1977 are fitted with an improved version of fuel pump EKP 4.



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TYPICAL HOT-START PROBLEMS

Possible cause	Diagnosis	Repair procedure
<p>Injectors leaking – dripping or pressure too low.</p>	<p>Remove injectors check for tightness and opening pressure.</p>	<p>Mount the injectors on test unit. Test opening pressure 2.5 – 3.6 bar. At a pressure of 0.6 bar, below opening pressure no drops must form at valve within 15 sec.</p>
		<p>Injectors do not leak, opening pressure correct.</p>
		<p>One or more injectors leaking or incorrect opening pressure.</p>
	<p>Start engine Adjust idling CO END</p>	<p>Replace leaking injectors. Ideally, use injectors with high opening pressure. This reduces the formation of vapour bubbles.</p>
<p>Cold start system defective Thermo-switch fails to switch off at temp. above $45^{\circ}\text{C} \pm 4^{\circ}\text{C}$</p>	<p>Check operation of thermo-switch</p>	<p>Remove double plug on cold-start valve. Connect test lamp to both plug contacts. Start engine and warm up (oil temp. $60 - 80^{\circ}\text{C}$). Switch engine off. Apply hand throttle* Start warm engine again (with hand throttle pulled*) The test lamp must not come on during the starting operation.</p>
		<p>No damage detectable</p>
		<p>Damage located and repaired</p>
	<p>Start engine Adjust idling CO END</p>	

TYPICAL HOT-START PROBLEMS

Possible cause

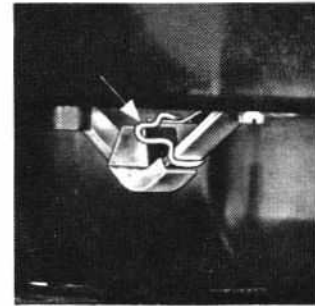
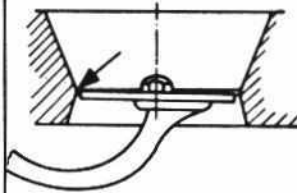
Diagnosis

Repair procedure

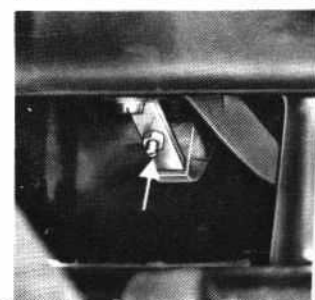
Sensor plate stop too low

Remove rubber bellows between air sensor housing and throttle housing, check sensor plate position

Release pressure in fuel system. For this purpose loosen pressure fuel line connection to warm-up regulator at fuel distributor slightly to release remaining pressure. Wrap a rag around fuel line to trap excess fuel. The upper edge of the sensor plate must now be flush with the taper edge at the point shown in the diagram on the left.



If necessary an adjustment can be made by bending the spring clip (arrow in figure above). From the 1977 model the adjustment is made by turning the screw shown (arrow in figure on right).



After adjusting, check sensor plate for free movement. Check sensor plate position under highest pressure (warm). Switch on fuel pump.

The adjusted position of the sensor plate must not change by more than 0.5 mm when control pressure is applied. Replace flat spring on sensor plate stop if necessary. Adjust to zero position.

Start engine

Adjust idling CO

END

IMPROPER IDLE (Uneven idle with warm engine)

Test conditions	Possible causes
<p>Valve clearance ignition timing and spark plugs in order; no misfiring; performance satisfactory</p>	<p>Uneven idling engine warm</p> <ul style="list-style-type: none"> wrong idle CO setting air intake system (leak after sensor plate) starting valve leakig fine screens in injection valves clogged
<p>Accelerator linkage returns to idle position and moves freely</p>	<p>Idle sticks at about 1500 rpm, or idle speed drops off sharply for a short time when accelerator is released</p> <ul style="list-style-type: none"> Pneumatic valve diaphragm reacts too slowly Auxiliary air slide is permanently open Auxiliary air valve does not close
<p>Acceleration characteristics normal; no hot start difficulties</p>	<p>Engine starts but stops again</p> <ul style="list-style-type: none"> Sensor plate stop too low

Possible cause	Diagnosis	Repair procedure
<p>Incorrect idle CO adjustment</p>	<p>Measure idle CO</p>	<p>Bring engine to operating temperature (warm-up regulator fully actuated)</p> <p>Connect CO measuring unit</p> <p>CO content at idle speed 900 ± 50 rpm = 1.0 – 1.5 % (vehicles with throttle valve = 2.5 %). See also Appendix "Test and adjustment values".</p> <p>Having adjusted CO content remove adjusting key and briefly press the accelerator.</p> <p>Check idle characteristics</p> <p>Idle not normal CO content changes</p> <p>Idle and CO content normal</p> <p>END</p>

IMPROPER IDLE (uneven idle with warm engine)

Possible cause	Diagnosis	Repair procedure
Air intake system leaking after sensor plate	Check air intake system for tightness. See also Technical Information Gr. 2 No. 3, dated 5. 7. 1977.	<p>Leaks in the air system cause a weakening of the mixture.</p> <p>Leaks may occur:</p> <ul style="list-style-type: none"> • at rubber bellows • at throttle housing (flange and throttle bearing) • at starting valve gasket • at intake manifolds • at plastic sleeves and rubber seat rings of injection valves • at intake manifold gaskets • or at air distributor housing (cracked) <p>On Sportomatic vehicles the</p> <ul style="list-style-type: none"> • vacuum hoses may be defective • hoses to the auxiliary air valve and the auxiliary air slide
		No leaks found
	Leave engine running. Set idle CO. Check idle characteristics	Leaks found and corrected
	END	
Starting valve leaks	Check starting valve for leaks	<p>Remove rubber bellows from throttle housing. Connect a test lamp to B+ and ground.</p> <p>Insert the test lamp in the throttle housing as far as the vacuum distributor housing. Switch on the fuel pump. With a mirror, check the tightness of the starting valve. No drops should be visible.</p>
		No leaks found.
		Leaking cold start valve — renew.
		Repeat CO check. Correct if necessary.
		Check idle characteristics

Possible cause	Diagnosis	Repair procedure
		<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px;">Idle not normal</div> <div style="border: 1px solid black; padding: 2px;">Idle normal</div> </div>
	END	
<div style="border: 1px solid black; padding: 5px;">Fine screens in injectors clogged</div>	<div style="border: 1px solid black; padding: 5px;">Remove and clean or renew injectors</div>	<p>See appendix for work sequence and tools</p> <p>After cleaning check the injectors for leaking and operation.</p> <p>Leakage: at a pressure of 0.5 bar below opening pressure, no drops must form at the valve within 15 seconds.</p> <p>Injector outlet pressure: 2.5 to 3.6 bar Dispersion in set: max. 0.6 bar.</p> <p>Note: Perfect cleaning of the injectors is not possible.</p> <p>If the injectors are found to be clogged, the rest of the fuel system must also be checked for dirt.</p>
	<div style="border: 1px solid black; padding: 5px;">Start engine Check idle characteristics Set CO content</div>	
	END	

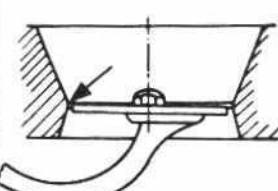
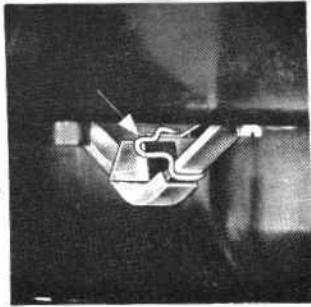
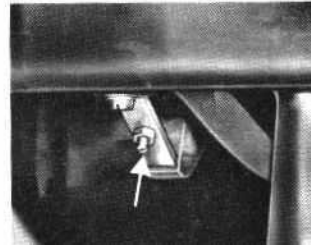
IMPROPER IDLE (idle speed remains at approx. 2000 rpm or falls off sharply for a short time when accelerator is released)

Possible cause	Diagnosis	Repair procedure
<div style="border: 1px solid black; padding: 5px;">Pneumatic valve faulty. Engine speed remains at approx. 2000 rpm for too long</div>	<div style="border: 1px solid black; padding: 5px;">Disconnect pneumatic valve control connector (upper) and seal it.</div>	<p>Note: The pneumatic valve is operating correctly if, when the accelerator is released quickly, the engine speed drops briefly to 1500 – 2000 rpm and then falls to idle speed.</p>
<div style="border: 1px solid black; padding: 5px;">Pneumatic valve faulty. Engine speed falls off sharply for a short time when accelerator is released.</div>	<div style="border: 1px solid black; padding: 5px;">Replace pneumatic valve</div>	
	<div style="border: 1px solid black; padding: 5px;">Start engine Check idle characteristics</div>	
	END	

IMPROPER IDLE (idle speed remains at approx. 2000 rpm or falls off sharply for a short time when accelerator is released)

Possible cause	Diagnosis	Repair procedure
<p>Faulty automatic start system</p>	<p>Check auxiliary air slide and auxiliary air valve with engine warm</p>	<p>Pre-Test:</p> <ol style="list-style-type: none"> Switch on ignition, disconnect the air sensor contact (pump operates). Disconnect the plug from the auxiliary air slider and connect a test lamp to it. Lamp must light. Switch off ignition. Connect an ohmmeter across the two contacts of the auxiliary air slide. It should read approx. 20 Ohm. From Bosch No. 0280 140 201, 30 Ohm. Check hoses for leaks. <p>Remove one hose from the auxiliary air slide and block both openings. Start the engine.</p> <p>Speed remains too high</p> <p>Speed reduces</p> <p>Replace auxiliary air valve</p> <p>Replace auxiliary air slide</p> <p>END</p>

IMPROPER IDLE (engine starts but stops again)

Possible cause	Diagnosis	Repair procedure
<p>Sensor plate stop too low ++ ++ Cold engine (below 45°C) only.</p>	<p>Remove rubber bellows between air sensor housing and throttle valve housing, check sensor plate position.</p> <p>Sensor plate position correct</p>	<p>Release pressure in fuel system. For this purpose loosen pressure fuel line to warm-up regulator at fuel distributor slightly to release remaining pressure. Wrap a rag around fuel line to trap excess fuel. The upper edge of the sensor plate must now be flush with the taper edge at the point shown in the diagram on the left.</p>   <p>If necessary an adjustment can be made by bending the spring clip (arrow in figure above). From the 1977 model the adjustment is made by turning the screw shown (arrow in figure on right).</p> 

Possible cause	Diagnosis	Repair procedure
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Automatic start system faulty

Start engine

Adjust idling CO

END

Check hoses for kinks and test auxiliary air slide.

Warm engine: auxiliary air slide closed
Cold engine: auxiliary air slide open

If the position of the auxiliary air slide is incorrect, check air and electrical connections. If necessary renew the auxiliary air slide.

END

Check idle characteristics

After adjusting, check sensor plate for free movement. Check sensor plate position under highest pressure warm). Switch on fuel pump.
The adjusted position of the sensor plate must not change by more than 0.5 mm when control pressure is applied. Replace flat spring on sensor plate stop if necessary. Adjust to zero position.

UNEVEN RUNNING (engine pulls unevenly at constant speed at about 2500 – 3000 rpm)

Test conditions	Possible cause
<p>Valve clearance, ignition, dwell angle and spark plugs in order</p> <p>Connector to ignition coil in order</p> <p>Engine starts properly when cold (if not, see "Typical cold-start problems")</p> <p>Maximum speed can be attained (if not, see "Performance unsatisfactory")</p> <p>Idle CO adjustment correct</p>	<ul style="list-style-type: none"> • Control pressure incorrect *• Throttle valve incorrectly adjusted • Incorrect sensor plate position. This is noticeable by uneven running at starting speed <p>Note: The tendency to run unevenly at constant speed differs from engine to engine and in some instances cannot be eliminated altogether even by the most careful adjustment. Make sure that the adjustment corresponds to the optimal values. Check the valve clearance, ignition and spark plugs as well.</p>

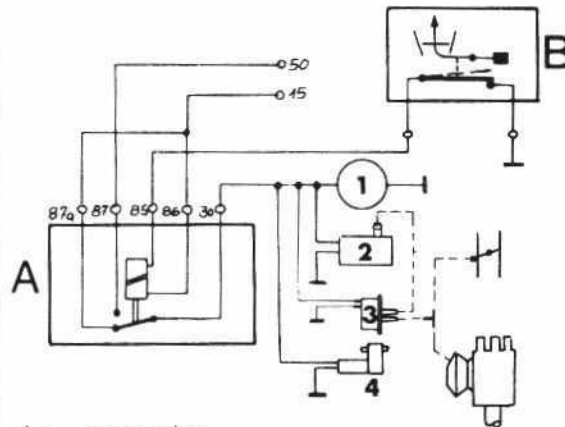
Possible cause	Diagnosis	Repair procedure
<p>Control pressure incorrect</p>	<p>Check control pressure</p>	<div data-bbox="831 1318 1448 1669" style="border: 1px solid black; padding: 5px;"> <p>Engine cold, connect pressure gauge. Set two-way valve to position 1, and firstly check system pressure 4.5 – 5.2 bar then set two-way valve to position 2. Allow warm-up regulator to heat up and observe the control pressure.</p> <p>Engine off: 2.9 ± 0.2 bar Idle: 3.6 ± 0.2 bar *Engine off: Throttle valve at partial load 3.4 – 3.5 bar</p> <p>Note: If the control pressure is always too high – blockage in the return connection.</p> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div data-bbox="831 1705 1063 1780" style="border: 1px solid black; padding: 2px;">Control pressure correct</div> <div data-bbox="1182 1705 1404 1780" style="border: 1px solid black; padding: 2px;">Control pressure incorrect</div> </div> <div data-bbox="831 1816 1458 2100" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Check warm-up regulator:</p> <p>Throttle valve in idle position: engine off. *2.0 – 3.1 bar 2.9 ± 0.2 bar</p> <p>With the engine running, the control pressure must rise to approx. 3.6 ± 0.2 bar If necessary, replace the warm-up regulator and repeat the test. *With the engine running, the control pressure must be higher at partial load 3.4 – 3.5 bar</p> </div>

UNEVEN RUNNING (engine pulls unevenly at constant speed)

Possible cause	Diagnosis	Repair procedure
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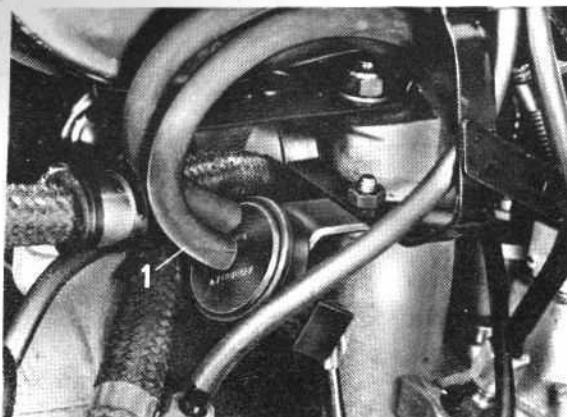
THERMAL VALVE

From 1977 model, an electrically heated thermal valve is inserted in the control connection for the warm-up regulator (throttle housing to vacuum advance).



- A = pump relay
- B = air sensor contact
- 1 = fuel pump
- 2 = warm-up regulator
- 3 = thermal valve
- 4 = auxiliary air slide

Check thermal valve



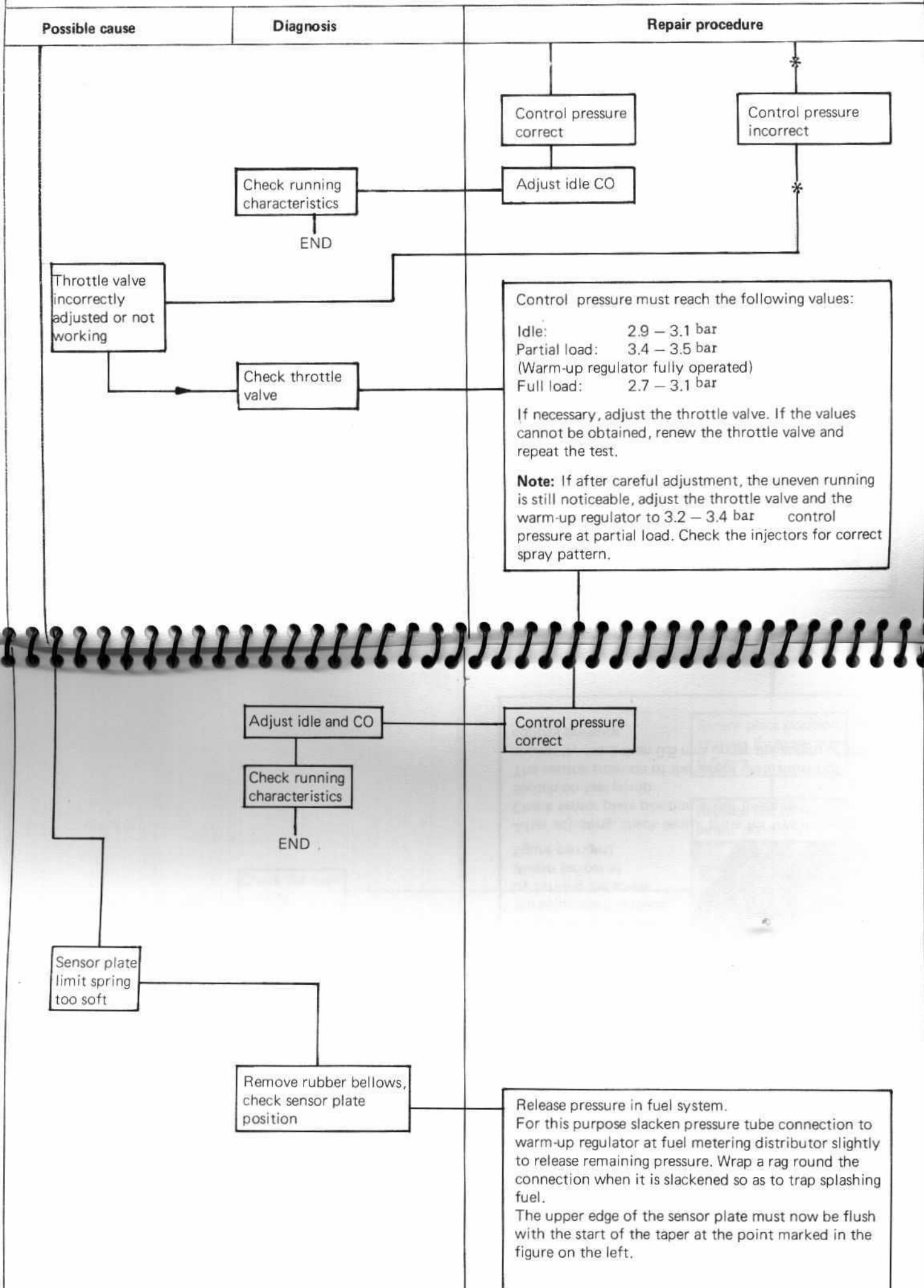
The thermal valve is closed when the engine is cold and prevents the vacuum in the suction tube to the warm-up regulator being effective. This delays the warm-up regulator change-over to weak mixture.

To test:

1. Disconnect the vacuum hose (1) from the warm-up regulator.
2. Switch on the fuel pump
3. Blow into the disconnected tube. At 20°C – 30°C, the valve must open after 10 – 30 seconds.

Fault found and corrected

UNEVEN RUNNING (engine pulls unevenly at constant speed)

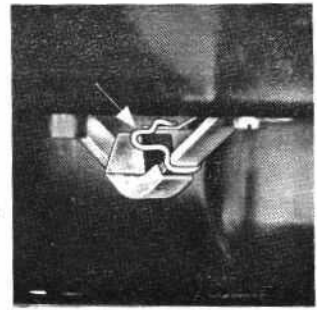
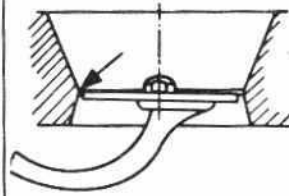


UNEVEN RUNNING (engine pulls unevenly at constant speed)

Possible cause

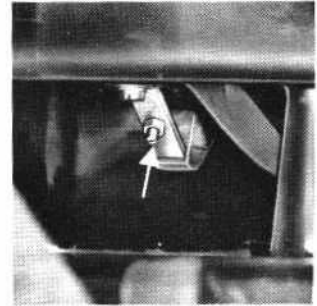
Diagnosis

Repair procedure



If necessary the adjustment of the sprung limit stop can be corrected by bending the wire bracket (arrowed in figure above).

From the 1977 model the adjustment is made by turning the screw shown (arrow in figure on right).



After adjusting, check sensor plate for free movement. Check sensor plate position under pressure. Switch on fuel pump. The neutral position of the sensor plate must not change by more than 0.5 mm under the action of the control pressure.

Check for even running

END

Sensor plate position changes by more than 0.5 mm

Replace flat spring on sensor plate stop

Set to zero position and adjust idle CO

UNSATISFACTORY PERFORMANCE

Test conditions

Possible cause

Valve clearance, ignition timing and spark plugs in order

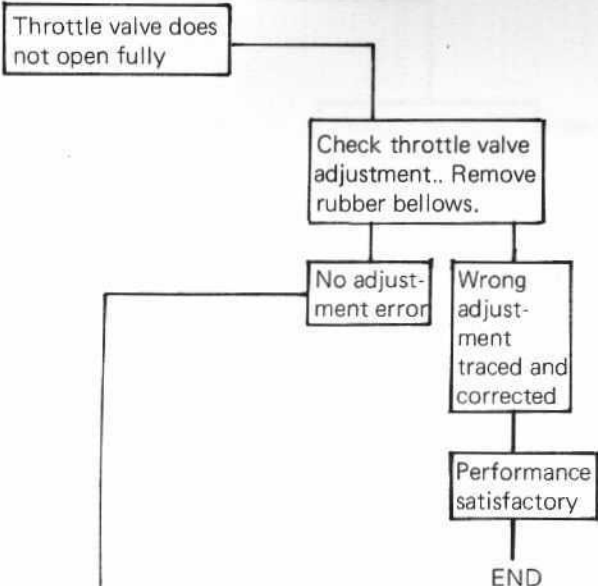
Mechanical condition of engine satisfactory

- Throttle valve does not open fully
- Sensor plate or control piston do not move freely
- Wrong idling CO setting
- Delivery from fuel pump insufficient, dirt in fuel system
- Tank vent blocked

Possible cause

Diagnosis

Repair procedure



UNSATISFACTORY PERFORMANCE

Possible cause

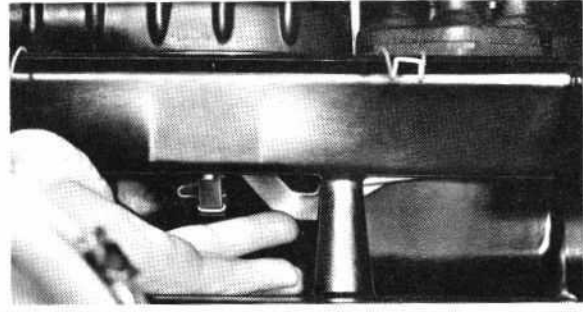
Diagnosis

Repair procedure

Sensor plate or control piston not moving freely

Check sensor plate and control piston for free movement

Remove air filter cover and filter and lift sensor plate lever from below. The lever must have equal resistance throughout its travel. In rapid downward movement the slowly following control piston lifts away from the lever; no resistance must be noticeable at that point.



Sensor plate and control piston move freely

Sensor plate does not move freely

Control piston does not move freely

Overhaul and adjust air flow sensor. See appendix for procedure

Remove control piston and carefully polish this area with crocus cloth



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Idle CO setting wrong

Check performance
END

Measure idling CO

Set idle CO

Bring engine to operating temperature (warm-up regulator fully actuated). Connect CO tester. Adjust CO content at idle speed 900 ± 50 rpm

Set CO content to prescribed value

Check performance

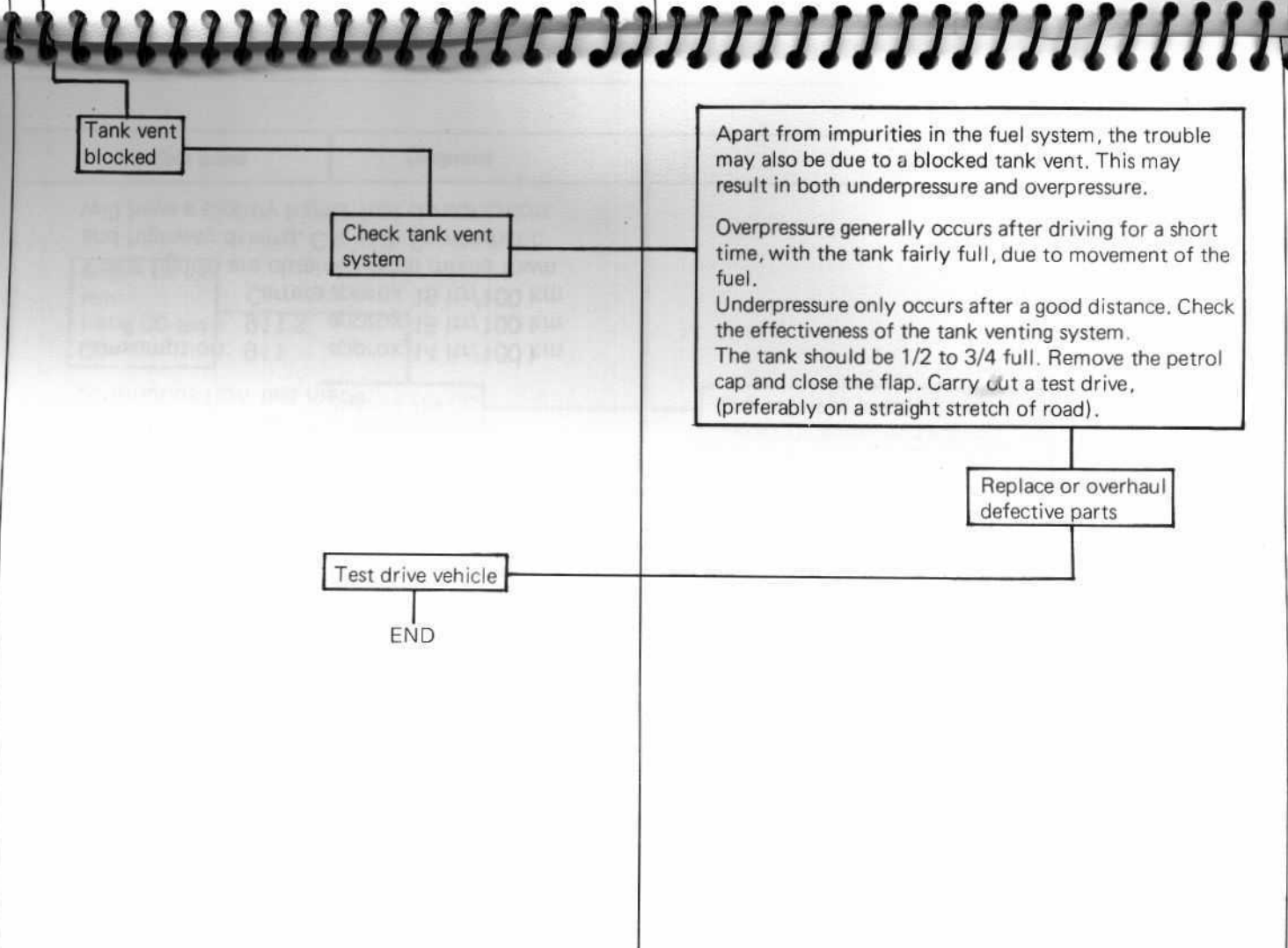
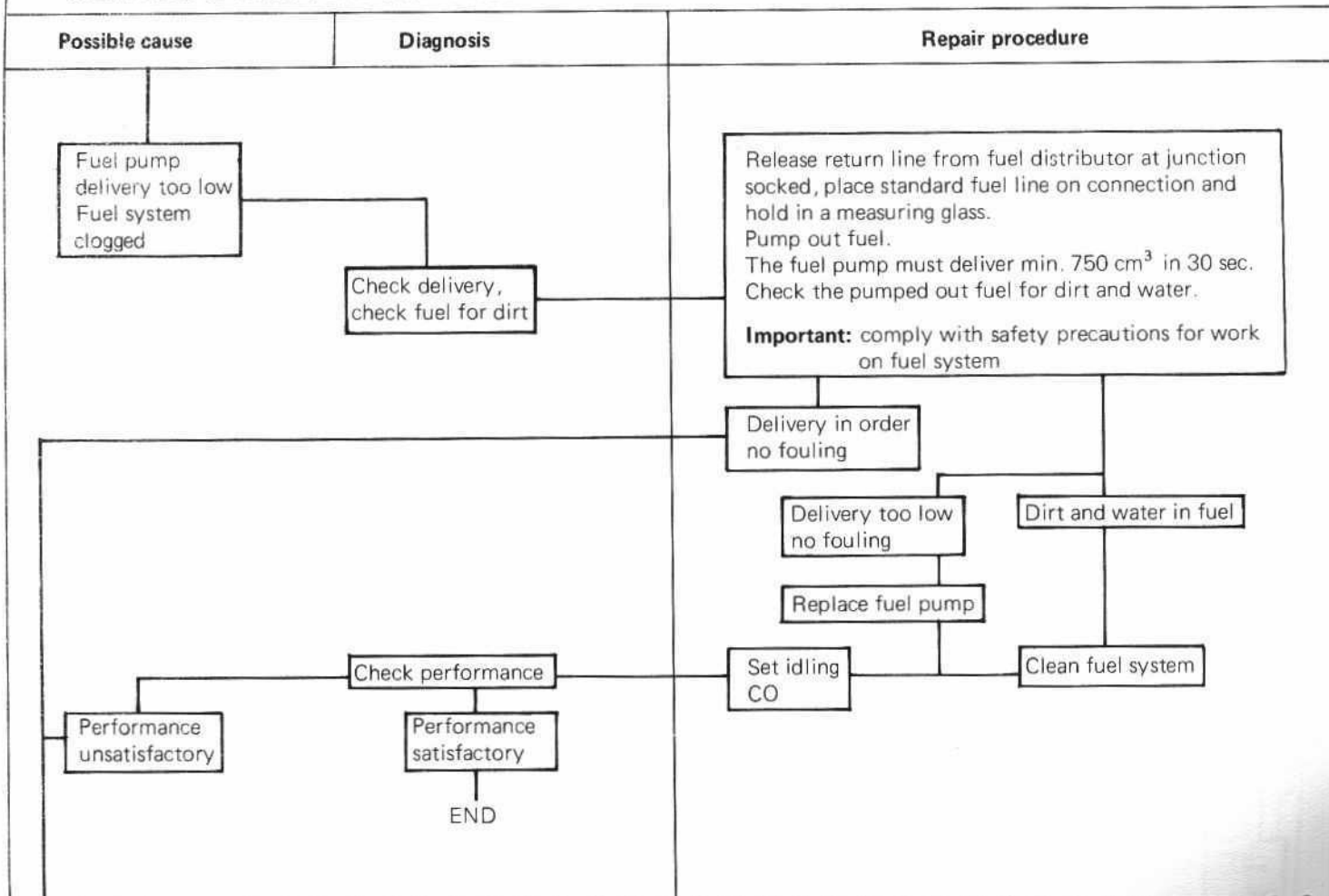
Performance unsatisfactory

Performance satisfactory

END

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UNSATISFACTORY PERFORMANCE



FUEL CONSUMPTION TOO HIGH

Test conditions

Test drive has shown fuel consumption significantly too high

Valve clearance and mechanical condition of engine correct

Ignition system and spark plugs in order

Notes on test drive:

The test drive should be carried out in the presence of the customer (equal periods of town and highway driving).

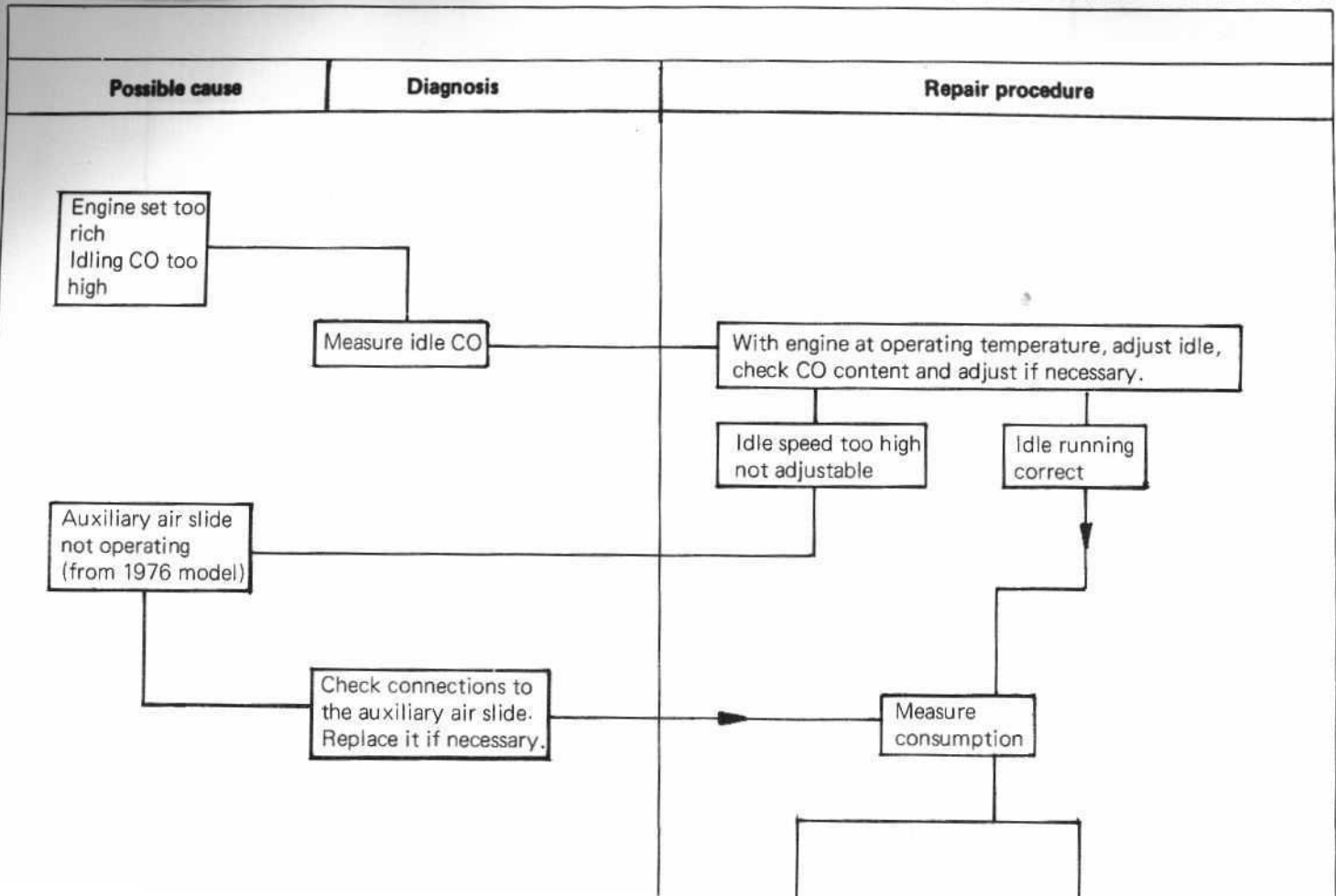
Consumption should be measured with continuous flow test meter.

Consumption: 911 approx 14 ltr/100 km
 911 S approx 15 ltr/100 km
 Carrera approx 16 ltr/100 km

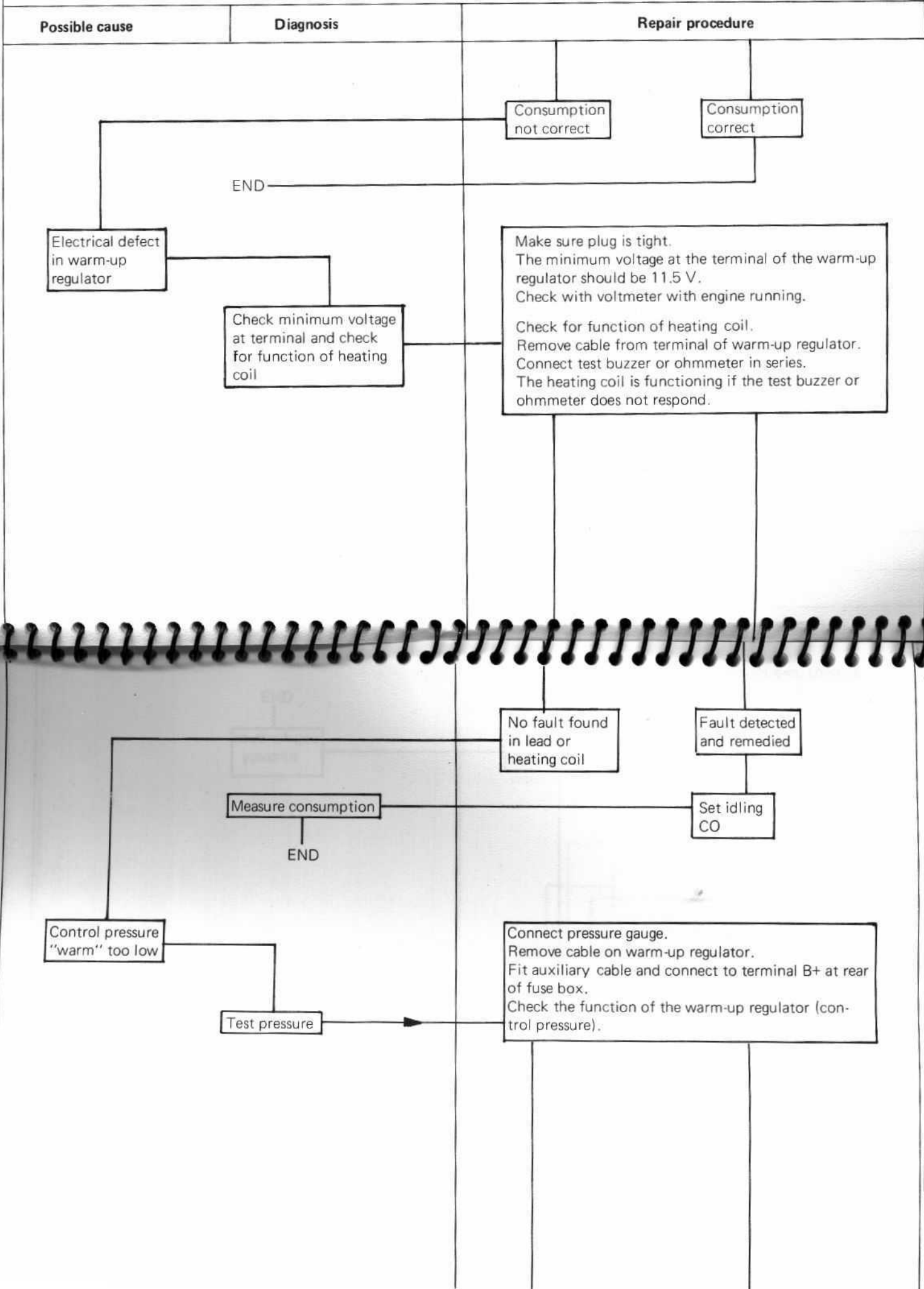
These figures are obtained from mixed town and highway driving. Car with Sportomatic will have a slightly higher fuel consumption.

Possible cause

- Idling CO setting too rich
- Auxiliary air slide not functioning
- Electrical problem in warm-up regulator or thermal valve
- Control pressure "warm" too low
- Starting valve leaking



FUEL CONSUMPTION TOO HIGH



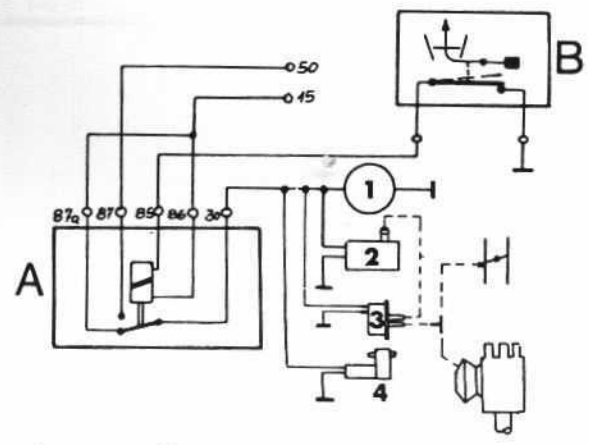
FUEL CONSUMPTION TOO HIGH

Possible cause	Diagnosis	Repair procedure
	<p data-bbox="389 850 535 924">Measure consumption</p> <p data-bbox="430 955 495 987">END</p>	<p data-bbox="828 189 1015 262">Control pressure correct</p> <p data-bbox="828 325 1015 451">Renew warm-up regulator. See also thermal valve.</p> <p data-bbox="828 850 950 924">Set idling CO</p> <p data-bbox="1128 189 1323 262">Control pressure too low</p> <p data-bbox="1128 294 1356 388">Block return line on warm-up regulator with hose clamp</p> <p data-bbox="1128 441 1388 514">Repeat control pressure measurement</p> <p data-bbox="1128 546 1242 640">Control pressure correct</p> <p data-bbox="1128 682 1242 808">Replace or adjust *regulator ++</p> <p data-bbox="1258 546 1372 640">Control pressure too low</p> <p data-bbox="1258 682 1372 808">Replace or adjust throttle valve</p>

++ If warm-up regulator is replaced, or control pressure changed, the engine characteristics must be checked at constant speed (check for even running).

THERMAL VALVE

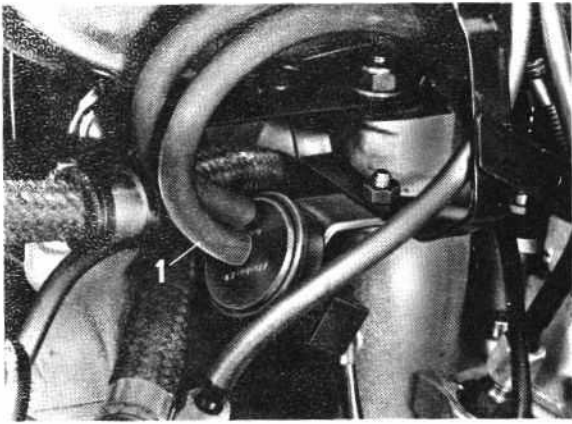
From 1977 model, an electrically heated thermal valve is inserted in the control connection for the warm-up regulator (throttle housing to vacuum retard.)



- A = pump relay
- B = air sensor contact
- 1 = fuel pump
- 2 = warm-up regulator
- 3 = thermal valve
- 4 = auxiliary air slide

Check thermal valve

Possible cause	Diagnosis	Repair procedure
----------------	-----------	------------------



The thermal valve is closed when the engine is cold and prevents the vacuum in the suction tube to the warm-up regulator being effective. This delays the warm-up regulator change-over to weak mixture.

To test:

1. Disconnect the vacuum hose (1) from the warm-up regulator.
2. Switch on the fuel pump
3. Blow into the disconnected tube. At 20°C – 30°C, the valve must open after 10 – 30 seconds.

Measure consumption

END

Fault found and corrected

Adjust idle idle CO

Starting valve leaks

Check starting valve for tightness

Remove rubber bellows from throttle housing. Connect a test lamp to B+ and ground. Insert the test lamp in the throttle housing as far as the vacuum distributor housing. Switch on the fuel pump. With a mirror, check the tightness of the starting valve. No drops should be visible.

Starting valve leaks – renew

Set idling CO

Measure consumption

Consumption correct

END

Appendix

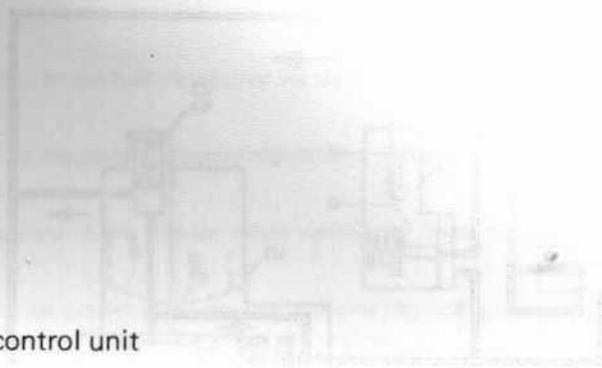
Fuel system diagram

Adjustment data

Adjusting the sensor plate

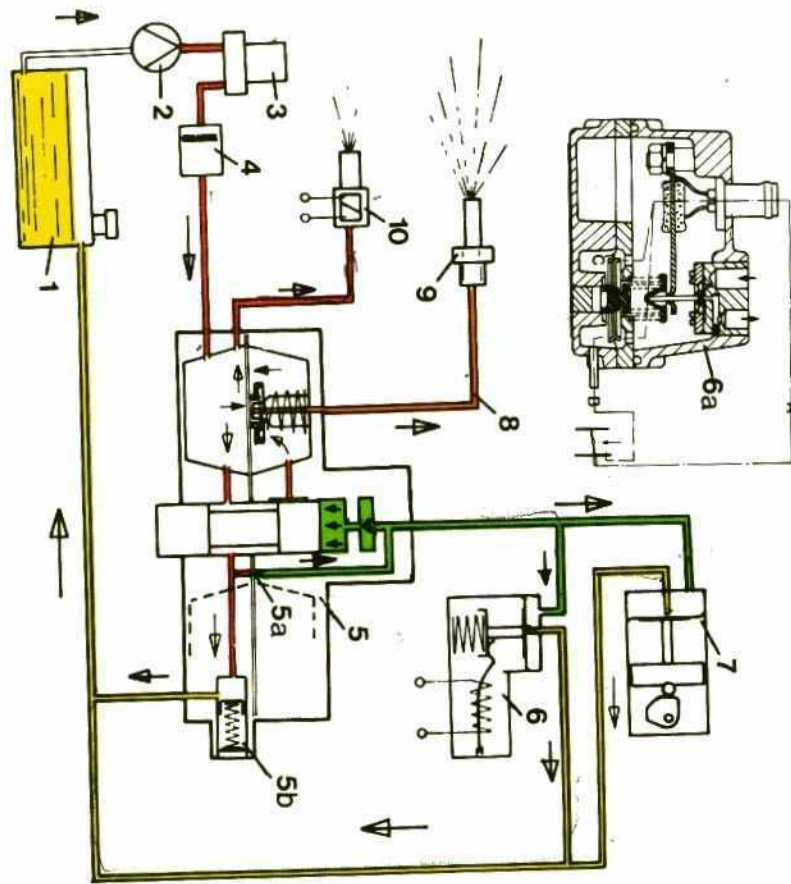
Cleaning the fuel system

Spare parts for the mixture control unit



Fuel System Diagram

- █ System pressure
- █ Distributed fuel
- █ Control pressure
- █ Return



- 1 Fuel tank
- 2 Fuel pump
- 3 Pressure reservoir
- 4 Fine filter
- 5 Fuel distributor
- 5a Pressure regulating valve
- 5b System pressure regulator
- 6 Warm-up regulator
- 6a Warm-up regulator (vacuum controlled)
- 7 Throttle valve (not fitted from 1976 model)
- 8 Injection lines
- 9 Injectors
- 10 Cold start valve

The fuel is fed from the electric fuel pump to the fuel distributor via the fuel pressure reservoir and the fuel filter.

The "system pressure" is kept constant by the system pressure regulator, a piston regulator in the fuel distributor.

From the fuel distributor, the fuel is supplied to the injector valves via injection lines, and to the cold start valve via an additional line.

The "control pressure" is branched from the system pressure via a pressure regulating valve. It is modified by the warm-up regulator to correspond to the operating state of the engine.

Test and Adjustment Data for K-Jetronic

Test	Test and adjustment data
Fuel pump delivery	minimum 750 cm ³ /30 s
Control pressure "cold" corresponding to external temperature	

Diagram for warm-up regulator
 Part No. 911.110.927.00
 (911.606.103.00)
 Bosch No. 0 438 140 001

Diagram for warm-up regulator
 Part No. 911.606.103.01
 Bosch No. 0 438 140 008

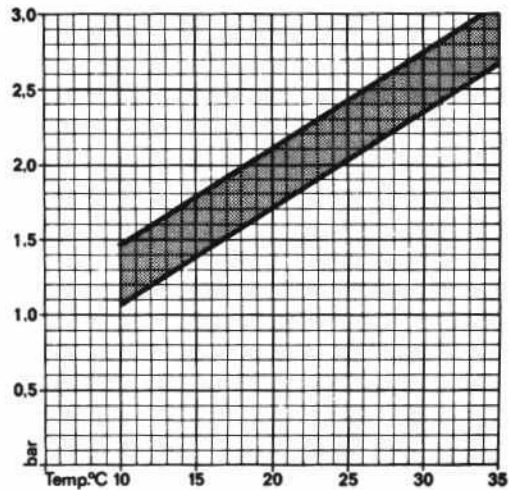
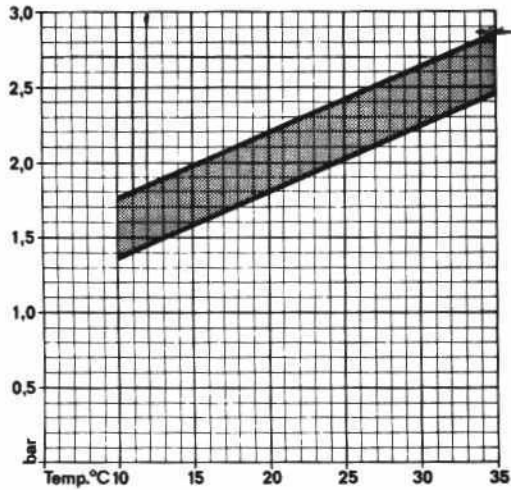
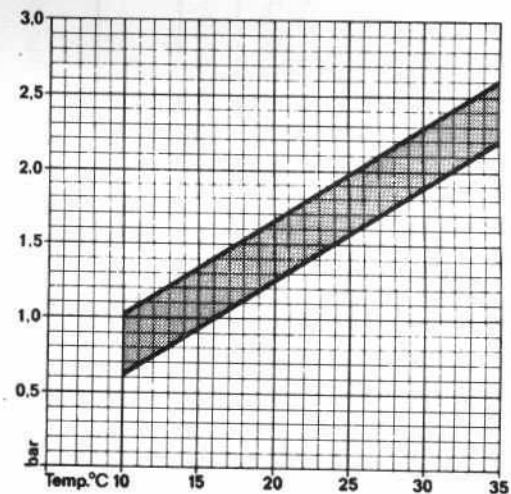
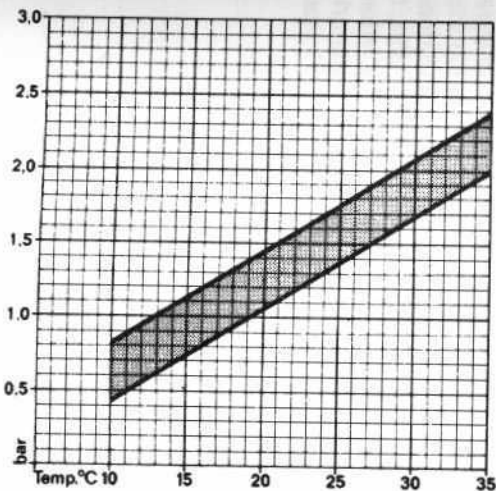


Diagram for warm-up regulator
 Part No. 911.606.105.01
 Bosch No. 0 438 140 009

Diagram for warm-up regulator
 Part No. 911.606.105.03
 and 911.606.105.04
 Bosch No. 0 438 140 017
 and 0 438 140 033



Test	Test and adjustment data																				
Control pressure "warm" Throttle valve position:																					
Idle	2.9 to 3.1 – adjustment tolerance 2.95 to 3.05																				
Partial load	3.5 to 3.9 (Europa 3.4 to 3.9)																				
Full load	2.7 to 3.1																				
Cars fitted with vacuum controlled warm-up regulator:																					
Engine off	2.9 ± 0.2 bar (kp/cm ²)																				
Idle	3.6 ± 0.2 bar (kp/cm ²)																				
System pressure	4.5 to 5.2 bar (kp/cm ²)																				
Leak test Minimum pressure after 20 min:	1.0 bar (kp/cm ²)																				
Injector valves																					
Opening pressure	2.5 to 3.6 bar (kp/cm ²)																				
Max. variation between those in one set or engine	0.6 bar (kp/cm ²)																				
Idle adjustment Idle rpm	<p>900 ± 50 rpm (manual gearbox to 77 model) 950 ± 50 rpm (Sportomatic to 77 model) 900 ± 50 rpm (Europa from 77 model) 950 ± 50 rpm USA, from 77 model) 1000 ± 50 rpm (California and high altitude countries, also Japan, from 77 model)</p>																				
CO content	<table> <tbody> <tr> <td>73 model (2.4 l)</td> <td>1.5 to 2.0 %</td> </tr> <tr> <td>74 model (2.7 l)</td> <td>1.5 to 2.5 %</td> </tr> <tr> <td>75 model Europa</td> <td>2.0 to 2.5 %</td> </tr> <tr> <td> USA</td> <td>1.7 to 2.2 %</td> </tr> <tr> <td> Calif.</td> <td>1.5 to 2.0 %</td> </tr> <tr> <td>75 model Europa</td> <td>1.0 to 1.5 %</td> </tr> <tr> <td>77 model</td> <td></td> </tr> <tr> <td>75 model USA*</td> <td>2.0 to 4.0 %</td> </tr> <tr> <td>77 model USA, California and high altitude countries*</td> <td>1.5 to 3.0 %</td> </tr> <tr> <td>77 model Japan</td> <td>1.0 to 2.0 %</td> </tr> </tbody> </table>	73 model (2.4 l)	1.5 to 2.0 %	74 model (2.7 l)	1.5 to 2.5 %	75 model Europa	2.0 to 2.5 %	USA	1.7 to 2.2 %	Calif.	1.5 to 2.0 %	75 model Europa	1.0 to 1.5 %	77 model		75 model USA*	2.0 to 4.0 %	77 model USA, California and high altitude countries*	1.5 to 3.0 %	77 model Japan	1.0 to 2.0 %
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Adjust sensor plate

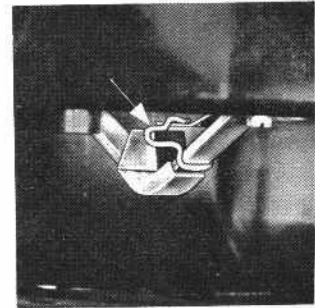
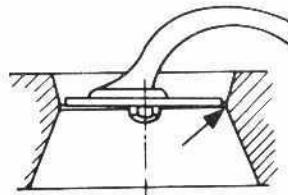
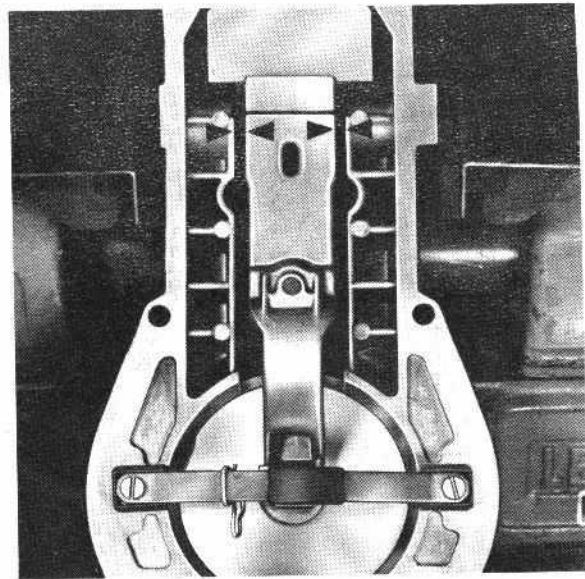
1. Lateral adjustment

After releasing the clamping screw on the counterweight of the sensor plate lever, the lever can be moved laterally on the axis and centered. Coat clamping screw with "Loctite" and tighten with torque of 47 – 53 kpcm.

2. Checking vertical adjustment

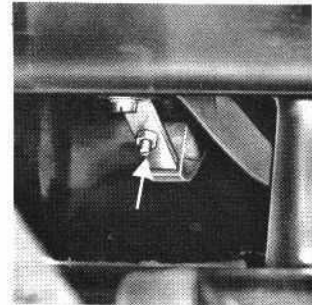
The top edge of the sensor plate must be level with the narrowest funnel diameter. A lower position down to a maximum of 0.3 mm is permissible (see diagram).

The vertical adjustment can be corrected by bending the spring clip at the stop.



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The vertical adjustment was changed with effect from mixture control unit Bosch 622, May 1976.
The spring stop is replaced by an adjusting screw, with which the sensor plate is adjusted.
The spring clip is not fitted.

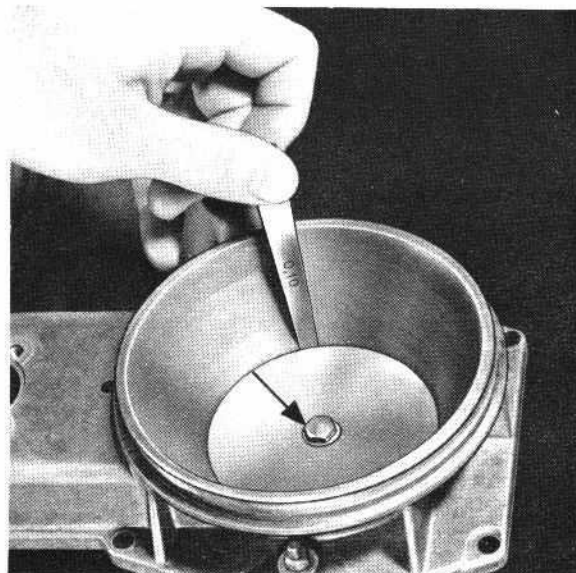


This setting must be checked in both the pressure-free and under pressure states; the sensor plate position must not vary by more than 0.5 mm; if it does, replace the flat spring.

3. Longitudinal adjustment

(vertical position must be correct)

Release sensor plate fixing screw and coat with "Loctite". Tighten the screw until the sensor plate can still just be moved.
Set a uniform gap of 0.10 mm between the sensor plate and air venturi. Tighten the fixing screw with a torque of 50 – 55 kpcm.
Make sure that the sensor plate adjustment is not changed when tightening.
Check the gap.



Cleaning fuel system

1. Replace fuel filter

2. Flush out pressure accumulator

3. Clean injection lines (with compressed air)

4. Clean injection valves

Cleaning will only be successful if the injection valve is flushed out in the direction **opposite** to the normal flow.

Tools and spare parts:

- 1 Bosch nozzle tester No. EFEP 60 H or locally made unit
- 1 pressure gauge 0 – 6 kp/cm² Cl. 1.0 100 mm dia.
- 1 reducing piece RSI 1/2" on 1/4" (obtainable from Steinebronn, 7 Stuttgart-Feuerbach, Kruppstraße 34 – 36) to mount pressure gauge on nozzle tester
- 1 locally made tool
- 1 valve plate
- 1 plastic hose (80mm long, 8 mm inside dia.) ET No. 911 201 228 00
- 2 hose clips ET No. 999 512 160 02

Locally made tool:

Saw open defective injection valve (approx. 7 – 10 mm from outlet aperture)
Remove valve spring plate with pincers
Clean sawn-off valve at cut section, wipe down and connect to plastic hose

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(8 mm inside dia.). Use hose clip No. 999 512 160 02 to secure.

The fouled injection valve is inserted in the opposite free hose section and also fixed with a hose clip (see diagram).

For safety reasons do not use carburettor fuel for cleaning; use only test oil

Sequence for cleaning operations:

- a. Lift needle of valve to be cleaned with pincers so that the valve spring plate is located between the raised needle and needle seat. The valve is now open and can be rinsed in the desired flow direction.
- b. Fit the valve together with the locally made tool and screw on to nozzle tester.
- c. Actuate nozzle tester several times thus rinsing the injection valve against flow direction (at least 15 times).
- d. Unscrew locally made tool with injection valve from nozzle tester and blow out with compressed air (max. 4 bar)

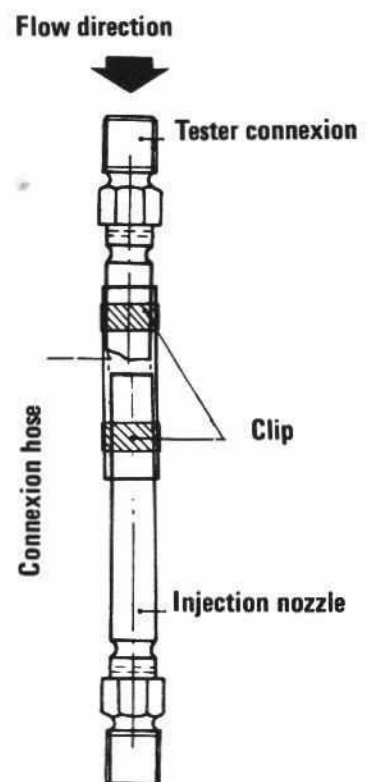
Check the injection valve for tightness, spray pattern and operating efficiency after cleaning.

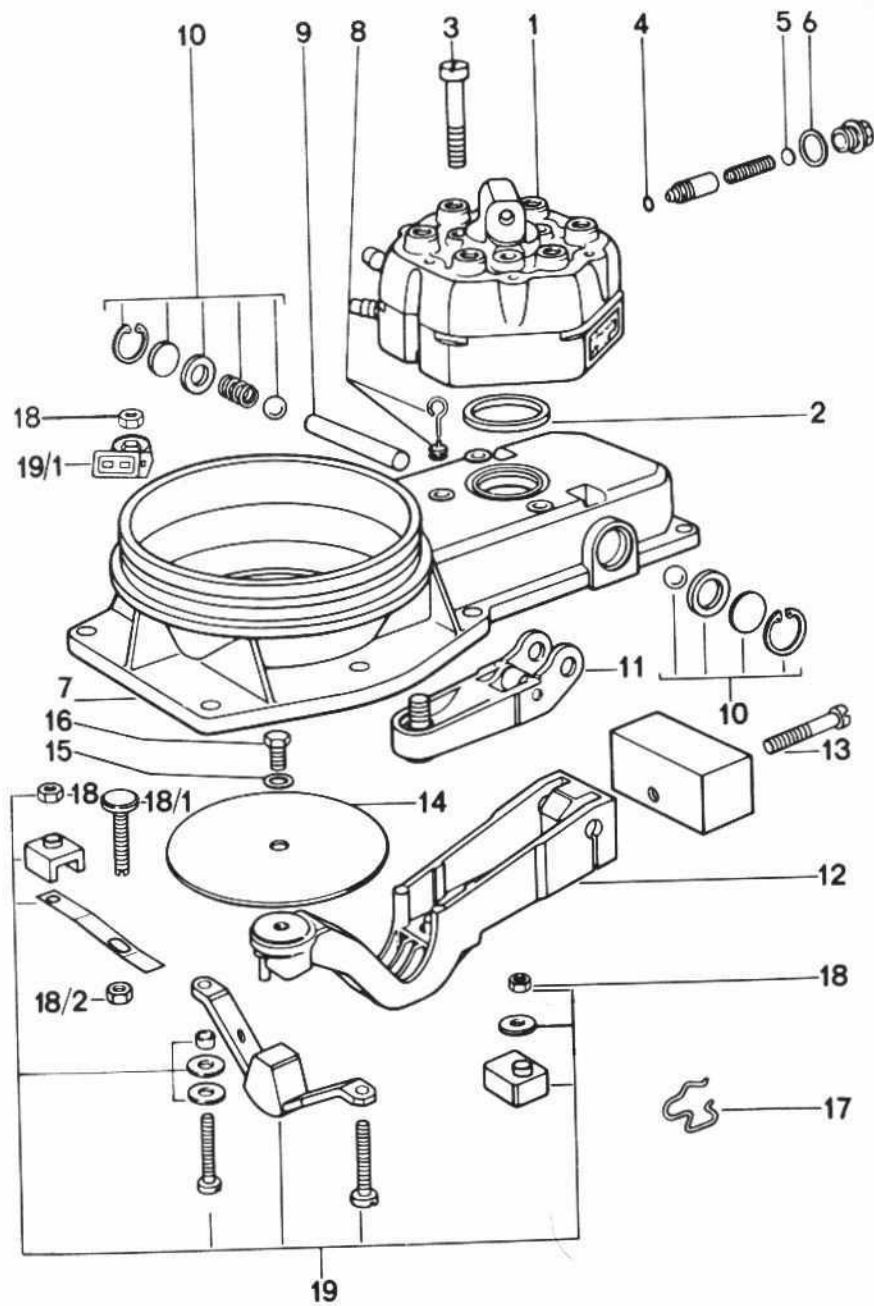
Opening pressure: 2.6 to 3.6 bar.

In one set, the variation in pressure must not be greater than 0.6 bar . If the variation is too great, the injector with the lowest opening pressure is to be replaced. The spray pattern is to be cone shaped (angle of spray 10 – 20°); a side deflected pattern is incorrect.

Leak test:

No drops should form within 15 seconds of a pressure being applied that is 0.5 bar below the opening pressure.





Spare parts for mixture control unit, K-Jetronic

No. in fig.	Designation
1	Fuel distributor
2	O-ring
3	Screw M 5 x 50
4	O-ring
5	Shim, thickness 0.1 mm or 0.5 mm
6	Gasket A 10 x 13.5
7	Air flow sensor
8	Plug
9	Pivot pin
10	Adjusting lever bearing
11	Adjusting lever
12	Sensor arm
13	Screw M 8 x 40
14	Sensor plate
15	Washer
16	Bolt
17*	Spring clip
18	Nut
18/1	Adjusting screw
18/2	Nut
19	Stop bracket
19/1	Socket for safety circuit

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We are unable to guarantee that they conform to the legal requirements of individual
countries.

As a result of continuing development, changes may be made without notice.

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