



COUNTACH 4V INJECTION

Adjustments of idling and fuel metering units

In case new meterings are assembled or when previous adjustments are doubtful please closely follow this procedure:

1) With power off engine

- a) check the right connection of electric connectors on injection components and the connection of air and fuel pipes. °
- b) disassemble 1 injector at least, each head. (photo no. 2)
- c) cut out the special safety relais (see picture no. 5) and turn the key in the instrument board. (photo no. 1)
- d) operate on the adjustment screws of metering unit until the injector begins to spray, then turn counter-clockwise for about 1/4 of turn (with power off engine the injector must not spray).
- e) connect again the safety relais and reassemble the injectors.
- f) connect the special connector 7 on the right side of engine compartment (in this way Lambda sensors are excluded). (photo no. 3)

2) Turning engine

After previous adjustments, the engine can be started:

- a) connect the mercury column vacuumeter and proceed to a summary adjustment of the by-pass screws and the throttle valve screws. (photo no. 4)
It is advisable to begin with a sufficiently high r.p.m. (about 2000 r.p.m. after the exclusion of additional air valves) and to lower it gradually alternating the control of synchronization to the control of CO (see item b).
- b) CO control
Connect a CO analyzer to the special tap on right side and to that of the left side of engine compartment, one after the other. (photo no. 5)
Adjust the CO percentage to $1,8 \pm 2,2\%$ (still maintaining connected the connector 7).
- c) control again the synchronization and alternating it with the CO control, bring the metering to about 1300 rev/min.
It is important that after the correction of the throttle valve and by-pass screws the CO will be always controlled again. *

° N.B. - Moreover it is very important to correctly place the rubber caps on spark plugs housings. At contrary, if rains, the water may enter in the spark plugs housing and cause ignition defects.



d) disconnect connection 7.

In this way the Lambda sensor begins to work and it's possible to see the CO descending to about $0,6 \pm 1\%$.

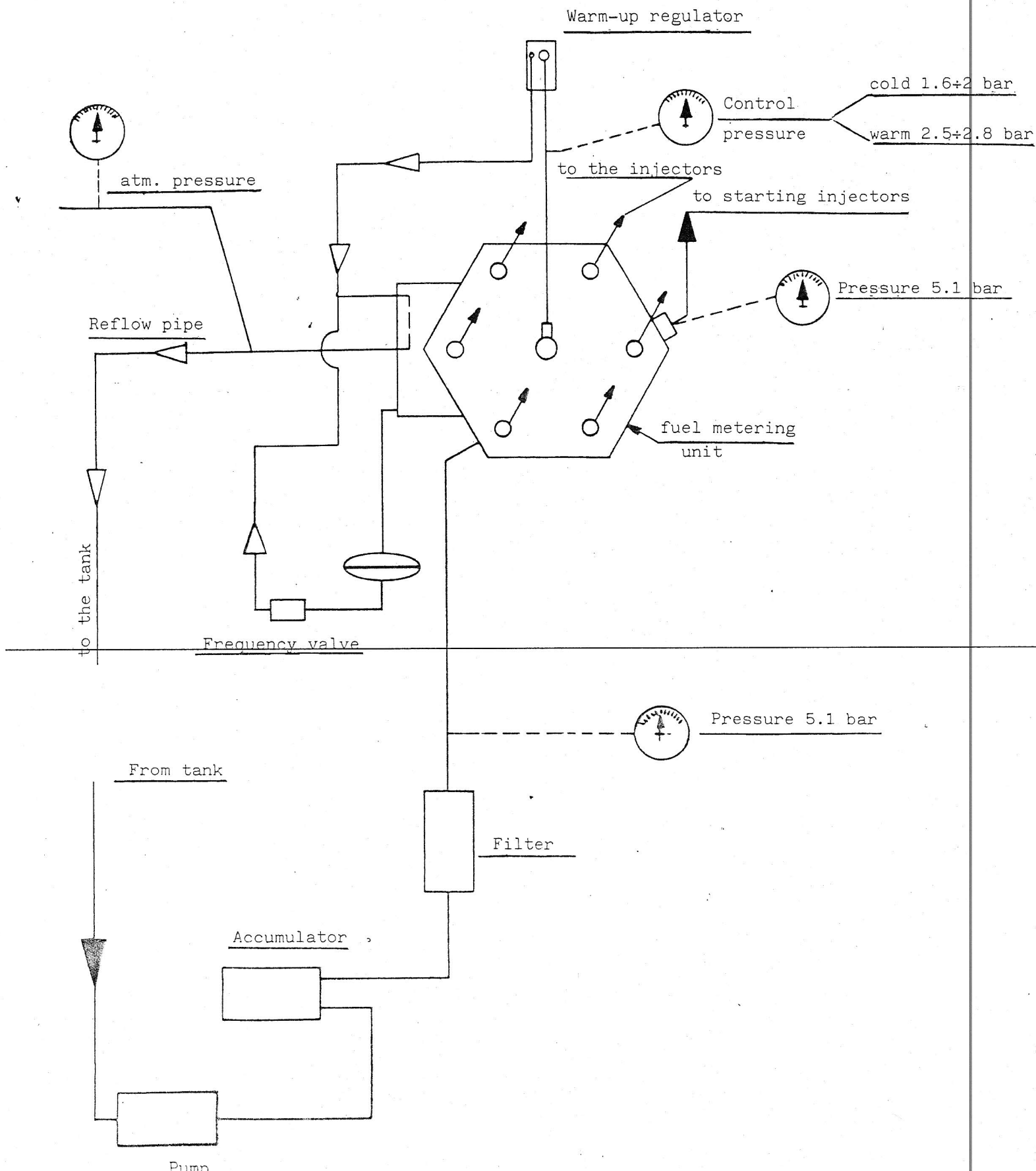
Also the rotation running must be normally reduced of about 200 rev/min. Control that the idle speed doesn't descend under 1050 rev/min. with lower beams lighted and air conditioning on.

N.B. - connection 7 must be only used to adjust idle speed on a sure reference value.

During normal working, connection 7 must be always disconnected.

* Control that the executed adjustment remains constant also after acceleration (on the car always accelerate with the pedal).

FUEL SYSTEM DIAGRAM L507V4I



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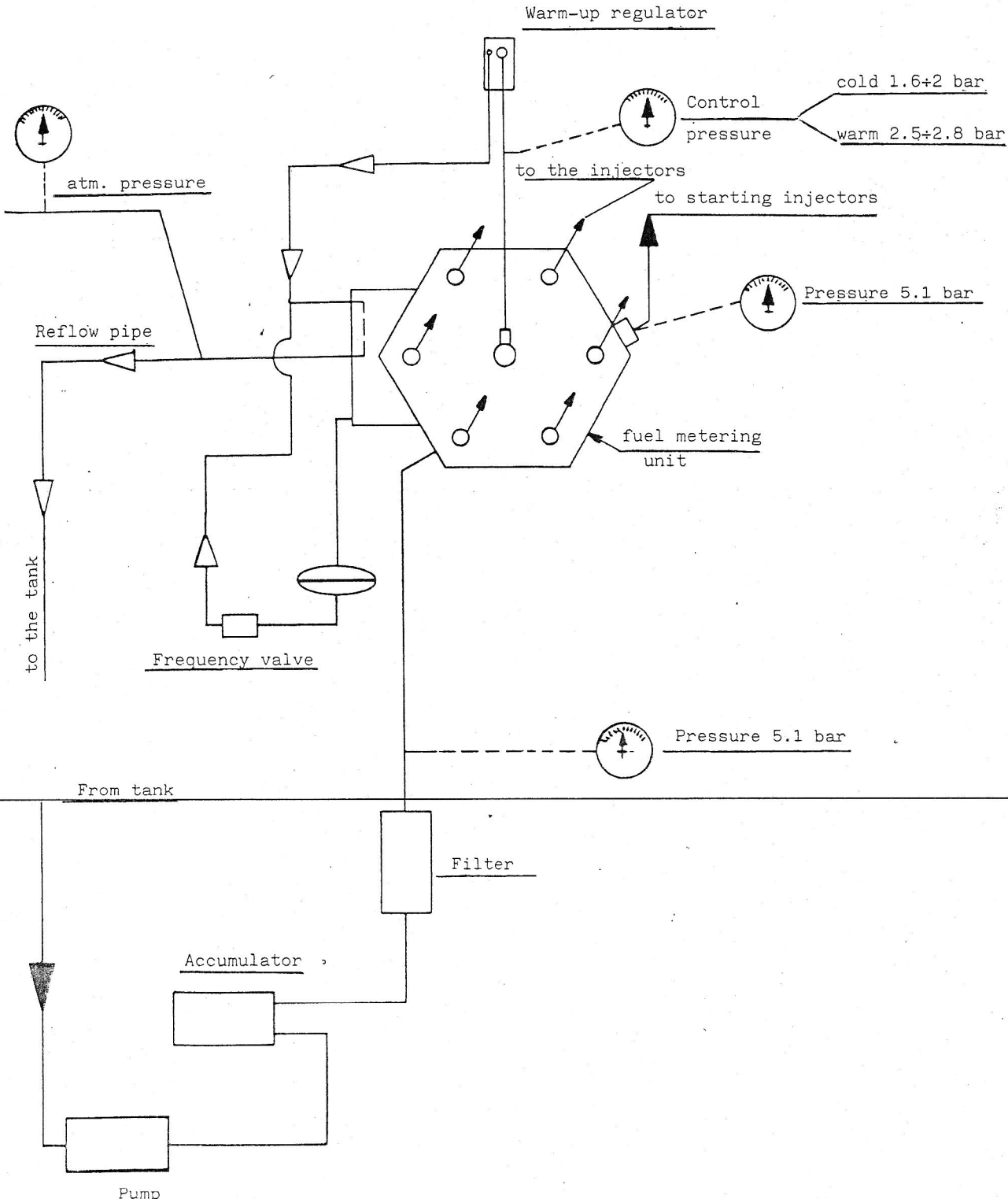
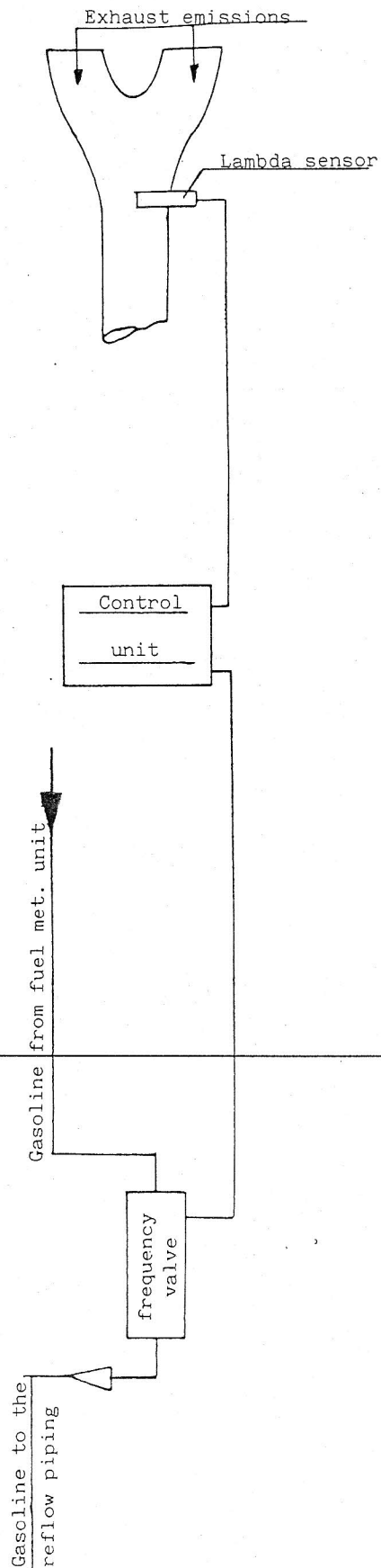


fig. 1

LAMBDA SENSOR SYSTEM



LAMBDA SENSOR

It intercepts the available oxygen quantity in the exhaust emissions and it sends the relevant signal to the control unit. (Bosch control unit)

CONTROL UNIT

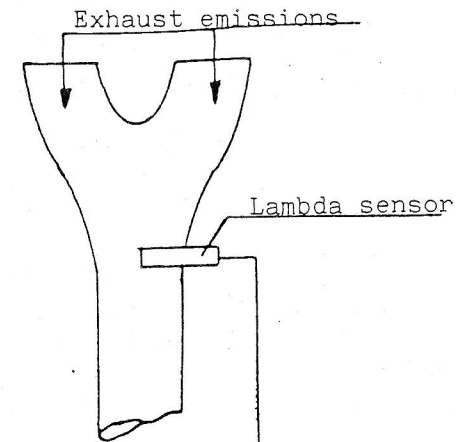
It receives the signal from Lambda sensor and deduces if the mixture is too rich or too poor. Consequently it sends a correcting signal to the frequency valve.

FREQUENCY VALVE

Substantially, it is an electromagnetic injector. When it receives the opening signal, it opens, discharging the pressure through differential valves of fuel metering unit and it enriches the mixture. The condition of max. lean-out corresponds therefore to the persistent closing of frequency valve (for example, when, by mistake, its electric connection doesn't connect).

fig. 2

LAMBDA SENSOR SYSTEM

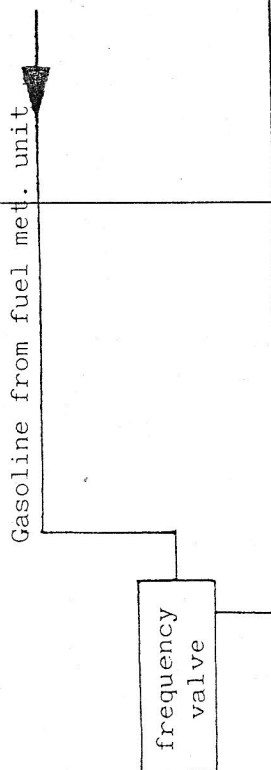
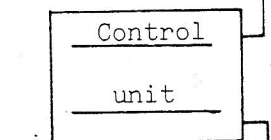


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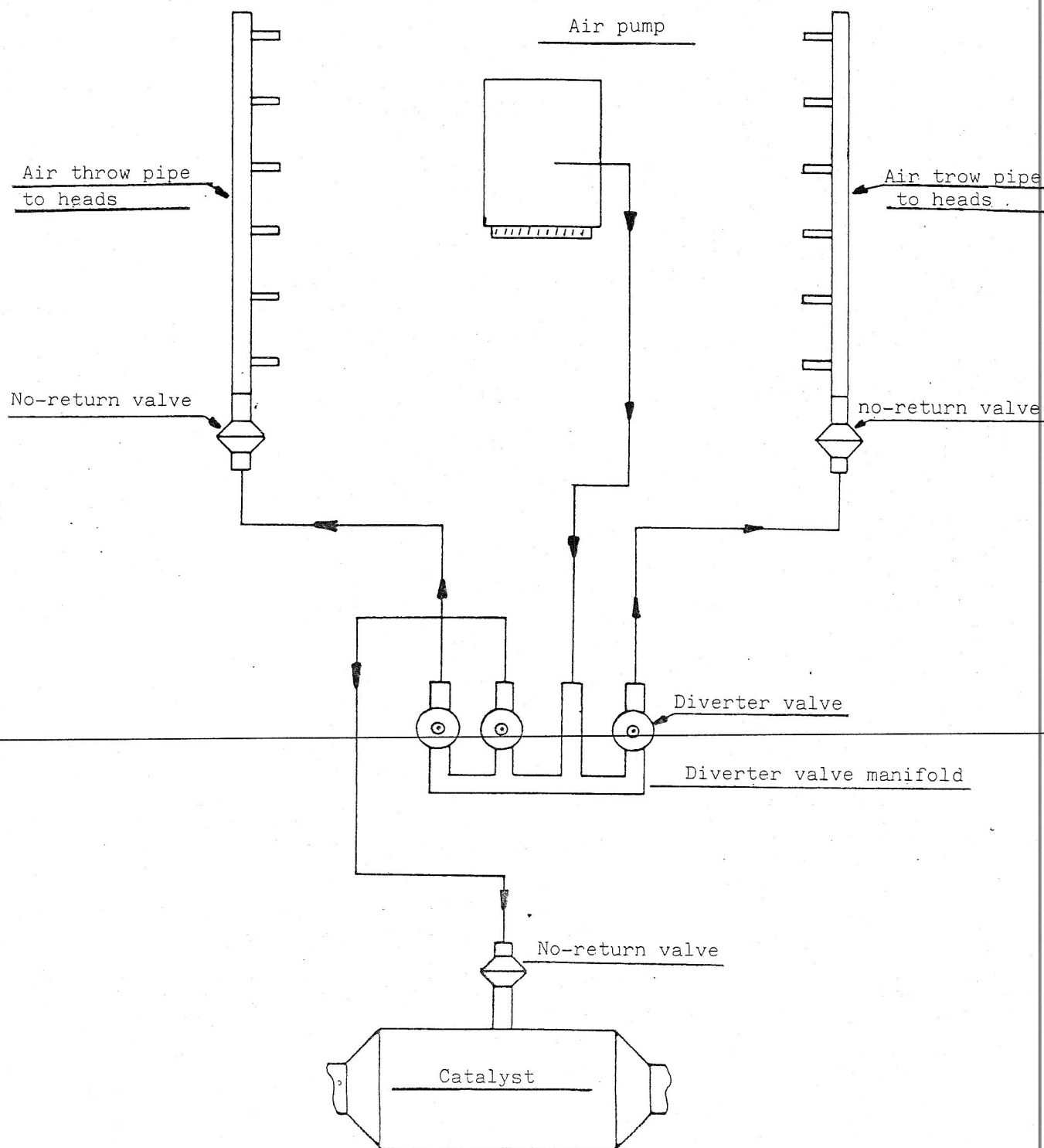
It receives the signal from Lambda sensor and deduces if the mixture is too rich or too poor. Consequently it sends a correcting signal to the frequency valve.

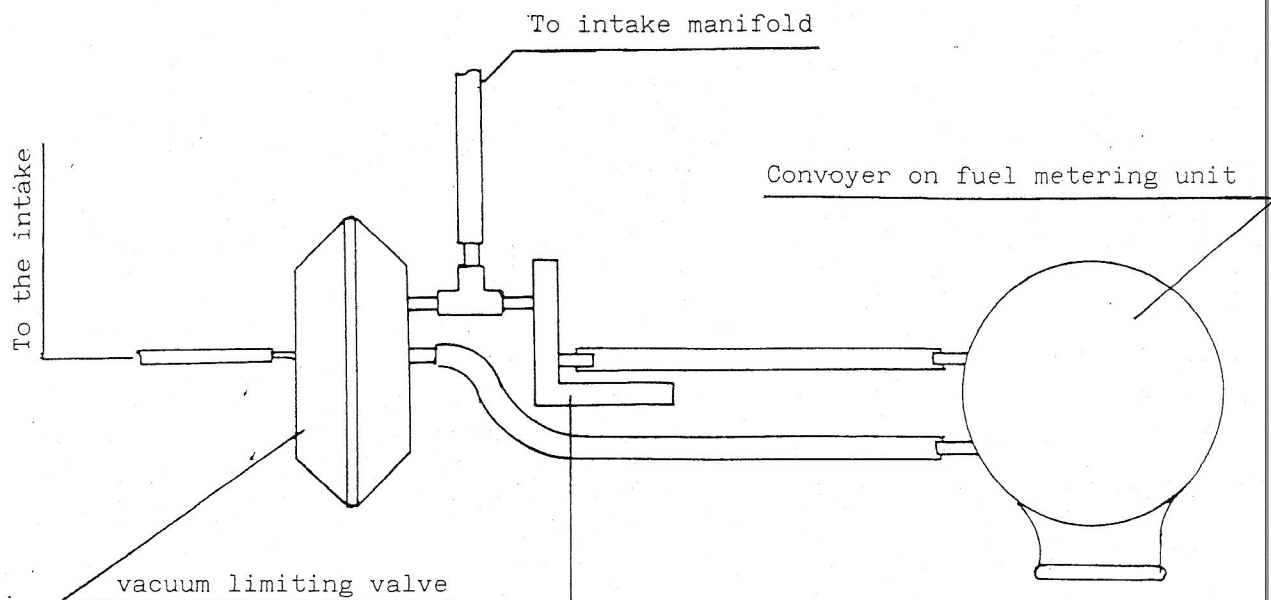


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AIR PUMP CIRCUIT L507V4I



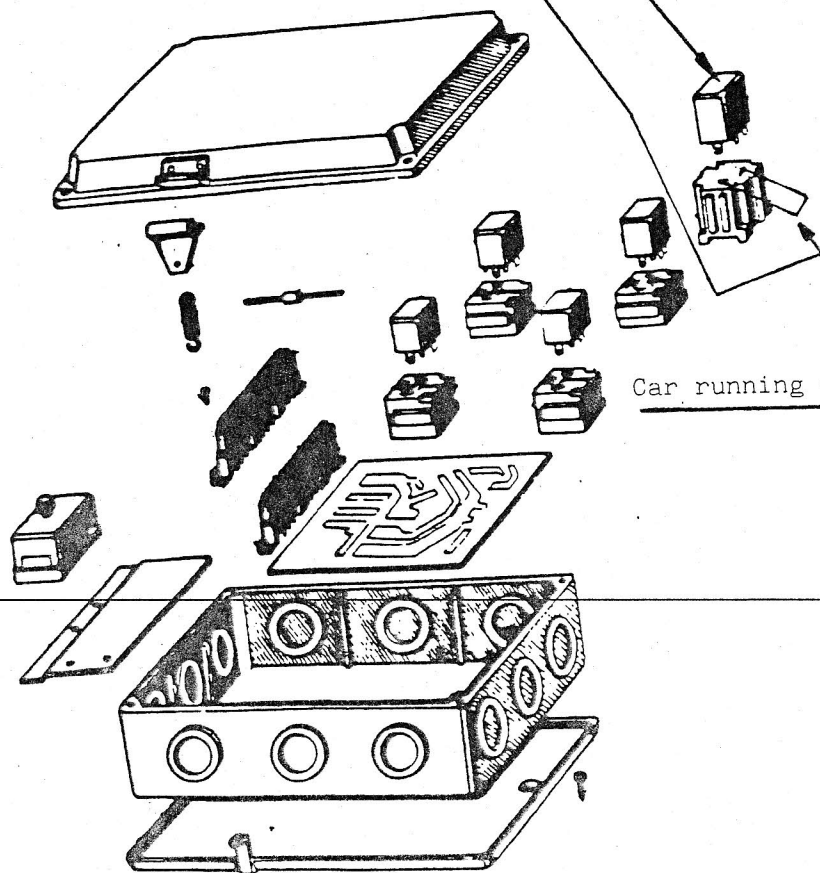


ADDITIONAL AIR VALVE

It must be opened when engine is cold
and must completely close 3:4 minutes
after starting.

"Bridge" applied to cut out
the relays

Special safety relays



Car running way



NECESSARY TOOLS FOR SYSTEM CONTROL

- 1) Main pressure survey manometer
 - 2) Control pressure survey manometer.
 - 3) CO analyzer.
 - 4) Set of pilot lamps to check Lambda sensors and diverter valves.
 - 5) Tester for electric components check.
 - 6) Oscilloscope: It is a not^{an} essential instrument (at contrary the precedents are essential) but sometimes may be very useful.
It is used to check the right working of Lambda sensors and frequency valves, to be connected to the special connection on the right side of engine compartment.
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LIST OF TROUBLES

Only the more usual troubles relevant to injection system are taken into consideration.

<u>Fault</u>	<u>Possible cause</u>	<u>Controls and operations to be executed</u>
1) When, after CO adjustment at idle, disconnect connection 7, the CO percentage remains <u>unchanged</u> .	a) Disconnected or defective frequency valve connection.	check the connection
	b) Disconnected or defective Lambda sensor connection.	" " "
	c) Electric connection break among Lambda sensors, Lambda control unit and frequency valve.	" " "
	d) Inefficient Lambda sensor.	replace defective sensor
2) When disconnect connection 7, the CO percentage <u>increases in place to reduce</u> .	a) Engine, previously adjusted, too lean	Check again the adjustment with <u>grounded</u> connection 7 and have a CO at $2,5 \pm 3\%$
	b) Inefficient Lambda sensor	Replace defective sensor.
	c) Air entry to the exhaust.	Check the right connection of diverter valves (with warm engine, we must have no air throw to heads).
3) With connection 7 connected, the CO percentage and the idle speed are difficult to adjust (i.e. the engine results very sensitive to the little revolutions of metering adjustment screw.	- air entry between fuel metering units and engine	Check the gasket tightness of intake manifold, connecting metering pipes and vacuum system.



4) The Lambda sensors easily fail (see also item 2d, 3b)	a) Idle too much rich b) Leaded gasoline was used.	Check again CO adjustment at idle. Pump down completely the system and replace with unleaded gasoline.
5) At warm, pilot pressure higher than 2,8 bar.	a) Defective warm up regulator b) Occluded warm up regulator connecting pipes or recycle pipe from metering to tank.	Replace regulator. Check pipe perviousness.
6) At warm, pilot pressure lower than 2,5 bar.	a) Disconnected or defective warm up regulator. b) Defective warm up regulator.	Check Replace
7) One or more cylinders don't burn.	a) Closed injectors connecting pipes. b) Defective injector.	Check the injectors throw, manually lifting the metering cap (with engine stopped, after the exclusion of the safety relais).
8) At warm engine, idle remains accelerated.	a) Defective idle after-burning device. b) Disconnected or defective additional air valve connection. c) Disconnected or defective warm-up regulator connection.	Check Check Check
9) With cold engine, starting difficulties.	a) wrong idle adjustment. b) Disconnection of starting injector connection or electric connection break. c) Closed starting injector pipe.	Check Check Check.



10) With warm engine,
starting difficulties.

d) defective additional air valve	Check
e) disconnected frequency valve.	Check
f) Too high control pres- sure.	check control pressure.
g) Defective fuel pump electric connection or defective fuel pump.	Check main pressure.
h) Disconnected grounded wire on engine.	Check
a) Wrong idle adjustment	Check
b) Too low control pres- sure (see item 6).	Check pilot pressure.
c) Defective fuel pump electric connection or defective fuel pump.	Check main pressure.
d) Disconnected grounded engine wire.	Check.
e) The check valve of fuel pump is clamped and the accumulator doesn't maintain in pressure the system with power-off engine.	Check main pressure after engine power-off.