SAAB

900

SERVICE MANUAL

2:3 Fuel system, fuel injection

M 1981–87–

SAAB 900

SERVICE MANUAL

2:3 Fuel system: Injection engines

M 1981–87–

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Units

The basic and derived units used throughout the Service Manual are in accordance with the SI system.

For users not familiar with the SI units, some non-Continental units are given in brackets after the respective SI unit.

The following symbols and abbreviations are used:

SI unit	Equivalent unit and symbol
mm	inch (in)
kg	pound (lb)
N	pound-force (lbf)
Nm	pound-force foot (lbf ft)
bar	pound-force per square inch (lbf/in^2) (Also abbreviated: psi)
l (litre)	US liquid quart (liq qt) (Also abbreviated: qts) US gallon (USgal)
°C	°F

Conversion factors

1 in = 25.4 mm	1 mm = 0.039 in
1 lbf = 4.45 N	1 N = 0.23 lbf
1 lbf ft = 1.36 Nm	1 Nm = 0.74 lbf ft
1 psi = 0.07 bar	1 bar = 14.5 lbf/in^2
1 liq qt = 0.95 l	1 l = 1.05 liq qt
1 US liq qt = 0.83 UKqt	1 USgal = 0.83 UKgal

Market codes

The codes refer to market specifications

AT	Austria	FR	France
AU	Australia	GB	Great Britain
BE	Belgium	GR	Greece
CA	Canada	IS	Iceland
CH	Switzerland	IT	Italy
DE	Germany	JP	Japan
DK	Denmark	ME	Middle East
ES	Spain	NL	Netherlands
EU	Europe	NO	Norway
FE	Far East	SE	Sweden
FI	Finland	US	USA

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Technical data

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Fuel system, B201 injection engines

Line and control pressures

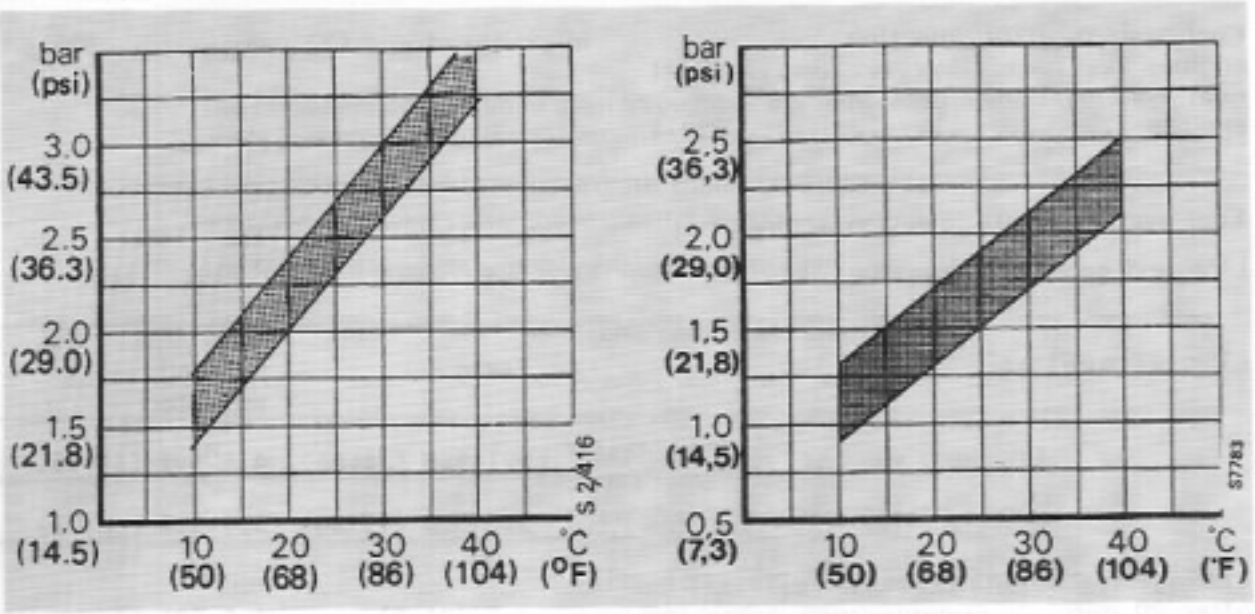
Line pressure:		Turbo	Normally aspirated
Checking value	bar (psi)	5.1-5.8 (74-84)	4.5-5.2 (65-75)
Setting value	bar (psi)	5.3-5.5 (77-80)	4.7-4.9 (68-71)
Leakage test: min. pressure after 20 min.	bar (psi)	1.5 (21.5)	1.5 (21.5)
Control pressure: normal engine temp.	bar (psi)	3.4-3.8 (46-55)	3.4-3.8 (46-55)
Control pressure at full load, normal temp. and charging pressure > 0.4 bar (5.8 psi)	bar (psi)	2.4-2.8 (35-40)	

Control pressure regulator

Turbo	1981-82	Bosch no. 0438140	085
	1983	Bosch no. 0438140	....084 (USA)
	1982-	Bosch no. 0438140	102
	1984-	Bosch no. 0438140	....136 (USA, Canada)*
Normally aspirated	-1982	Bosch no. 0438140	020
	1982	Bosch no. 0438140	....085 (Canada, manual gearbox)
			....020 (Canada, automatic transmission
	-1983	Bosch no. 0438140	....084 (USA)
	1983	Bosch no. 0438140	....011 (Canada)
	1983-84	Bosch no. 0438140	....111 (superseded in 1984 by ...020
	1984-	Bosch no. 0438140	....136 (USA, Canada)
	1985-	Bosch no. 0438140	020

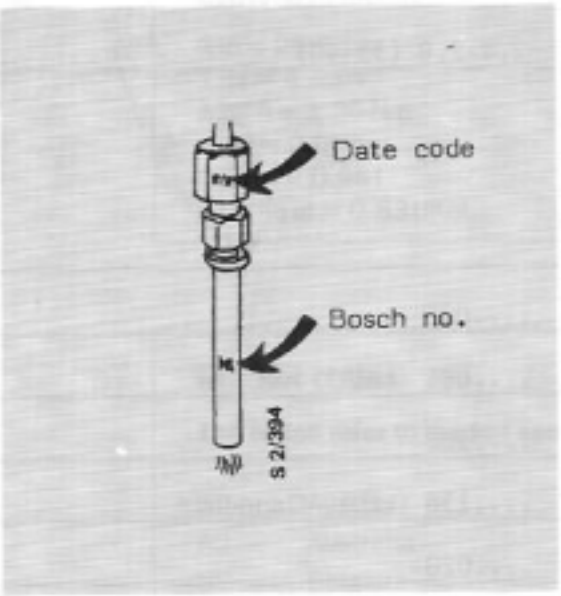
* Early 1984 model cars: Bosch no. 0438140084, colour-coded green.

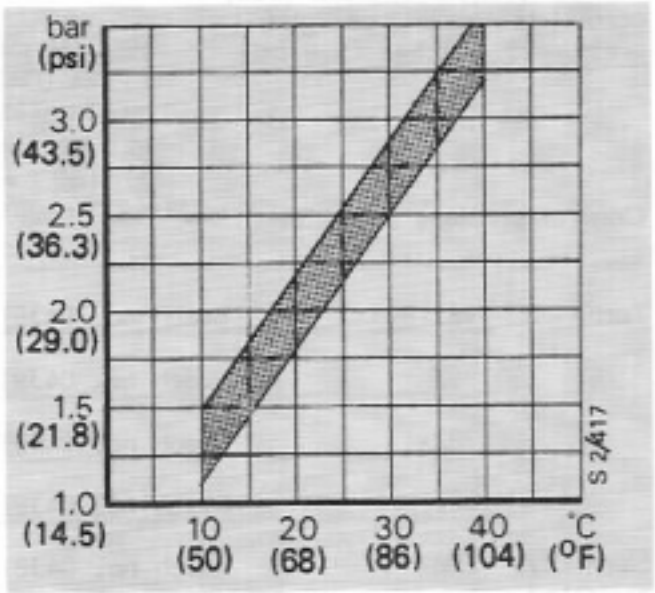
Control pressure: cold engine



Bosch no. 0438140084

Bosch no. 0438140020
085
111
070
102





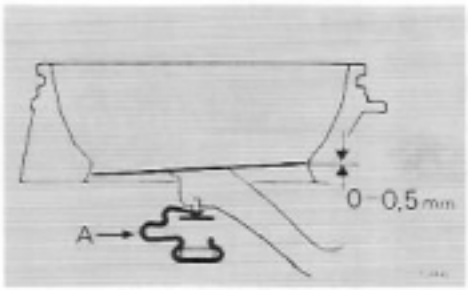
Bosch no. 0438140084 (colour-coded green)
136

Injection valves

Opening pressure	bar (psi)	3.0-4.1 (44-60)
Leakage test*	bar (psi)	2.4 (35)
Date code		-
Bosch no.		0437502012

*No leakage permissible for 15 s at this pressure.
Test to be carried out at rest pressure.

Air flow sensor



Air flow sensor plate rest position
Ignition must be isolated before starting test.

Tightening torques

Stop bracket retaining bolts	Nm (lbf ft)	4.7-5.3 (3.5-3.9)
Counterweight retaining screws	Nm (lbf ft)	4.7-5.3 (3.5-3.9)
Air flow sensor plate retaining screws	Nm (lbf ft)	5.0-5.5 (3.7-4.1)
Fuel distributor retaining bolts	Nm (lbf ft)	3.2-3.8 (2.3-2.8)
Screw plug for line pressure regulator	Nm (lbf ft)	13-15 (9.6-11.0)
M 8 bolts	Nm (lbf ft)	10-12 (7.4-8.9)
M 10 bolts	Nm (lbf ft)	13-15 (9.6-11.0)
M 12 bolts	Nm (lbf ft)	20-24 (14.8-17.7)
M 14 bolts	Nm (lbf ft)	15-20 (11.0-14.8)
M 12 cap nuts	Nm (lbf ft)	15-20 (11.0-14.8)
M 14 cap nuts	Nm (lbf ft)	25-30 (18.5-22.0)

Fuel booster

Type		Charging-pressure-related fuel enrichment
Simulated charging pressure at reduced control pressure	bar (psi)	0.33-0.40 (4.8-5.8)
Reduced control pressure (at charging pressure > 0.4 bar (5.8 psi)	bar (psi)	2.4-2.8 (35-40)
CO value at idling speed and simulated charging pressure > 0.4 bar (5.8 psi)	% CO	approx. 4-6

Fuel pump

Capacity, measured in return line	$cm^3/30S$ ($in^3/30S$)	900 (54.9) minimum

Fuel system, B202 injection engines

Line and residual pressure	Turbo	Normally aspirated
Line pressure (at atmospheric in inlet manifold) -1986 bar (psi)	2.5 ± 0.05 (36)	3.06 (43)
1987- bar (psi)	2.8 ± 0.05 (41)	
Residual pressure, engine switched off bar (psi)	2.3 (33)	2.8 (39)

Pressure regulator checking values

Turbo 1986 and earlier

Depression	Line pressure
0 bar	2.5 bar (36 psi)
-0.2 bar (-2.9 psi)	2.3 bar (33 psi)
-0.4 bar (-5.8 psi)	2.1 bar (30 psi)
-0.6 bar (-8.6 psi)	1.9 bar (28 psi)

Pressure	Line pressure
0 bar	2.5 bar (36 psi)
+0.2 bar (-2.9 psi)	2.7 bar (39 psi)
+0.4 bar (-5.8 psi)	2.9 bar (42 psi)
+0.6 bar (-8.6 psi)	3.1 bar (45 psi)

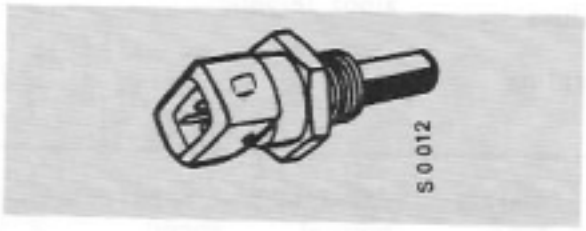
Turbo 1987 onwards

Depression	Line pressure
0 bar	2.8 bar (40 psi)
-0.2 bar (-2.9 psi)	2.6 bar (37 psi)
-0.4 bar (-5.8 psi)	2.4 bar (35 psi)
-0.6 bar (-8.6 psi)	2.2 bar (32 psi)

Pressure	Line pressure
0 bar	2.8 bar (40 psi)
+0.2 bar (-2.9 psi)	3.0 bar (43 psi)
+0.4 bar (-5.8 psi)	3.2 bar (46 psi)
+0.6 bar (-8.6 psi)	3.4 bar (49 psi)

B202I 1986 onwards

Depression	Line pressure
0 bar	3.0 bar (43 psi)
-0.2 bar (-2.9 psi)	2.8 bar (40 psi)
-0.4 bar (-5.8 psi)	2.6 bar (37 psi)
-0.6 bar (-8.6 psi)	2.4 bar (35 psi)



Temperature transducer

Resistance at	0°C (32°F)	ohm	5800
	20°C (68°F)	ohm	2600
	80°C (176°F)	ohm	320

Auxiliary air valve
(1985 and earlier models only)

Resistance	ohm	40-60

Idling control valve (as from 1986 models)

Resistance	ohm	40 ± 4

Full-load enrichment

Throttle switch: butterfly angle when contacts make	deg.	approx. 72
CO value at simulated full-load	%	4-6

Fuel pump

Capacity at back pressure of 2.5 bar (36 psi) - Turbo; or 3.0 bar (44 psi) - normally aspirated	$cm^3/30s$	900 (54.9) minimum

Idling speeds and CO values

at normal engine temperature

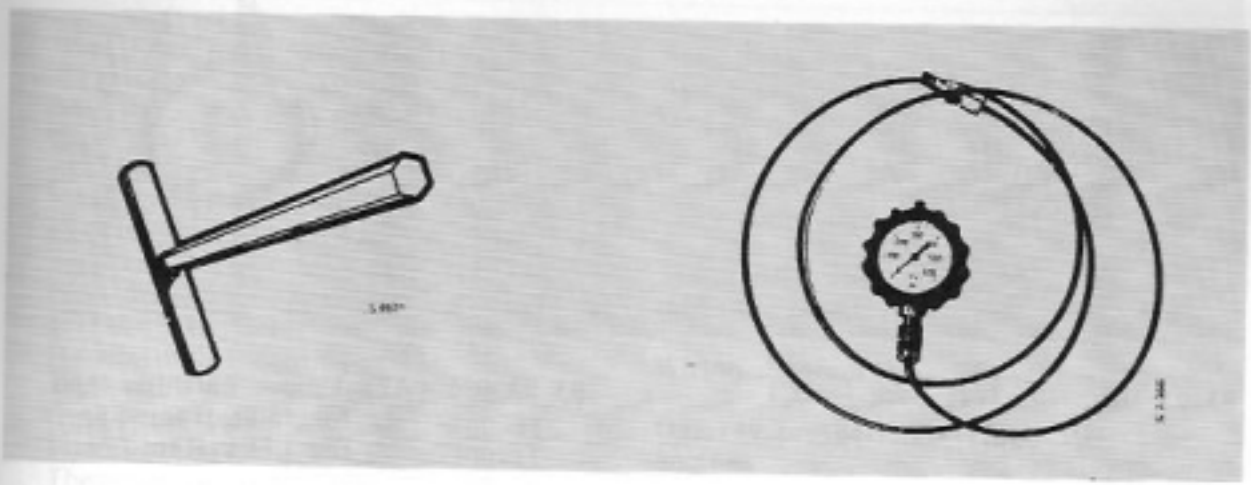
Engine	Model year	Market spec.	CO % at normal eng. temp	Engine speed for check	CO value at idling speed	Idling speed, ±50 r/min
Injection	-81	Sweden	1.0-2.0	2000	max 4.5%	875
norm.		Europe	0.5-2.5	850	-	875
aspirated						
(IM, IA)	1982-	All	0.5-1.5	850	-	850
Turbo	-81	Sweden	1.0-2.0	850	-	850
(SM, SA)		Europe	0.5-2.5	850	-	850
(SAM, SAA)	1982-	All	0.2-1.0	850	-	850
Turbo 16	1985-	All	0.9-1.6	850	-	850
(SLM, SLA)						

CO value/pulse ratio (USA)

Idling speed,	1981	875 ± 75 r/min (N/A CA)
	1981-83	850 ± 75 r/min (CA)
	1984	875 ± 75 r/min (CA)

Engine	Model year	CO value	Pulse ratio	
With catal-	1981		55 - 65	Reading on pulse
ytic converter	1982		45 - 55	ratio meter
CA, non-Turbo	1981	1.0 - 2.0		
	1982/83	0.5 - 1.5		
	1984		45 - 55	Reading on pulse ratio meter

Special tools

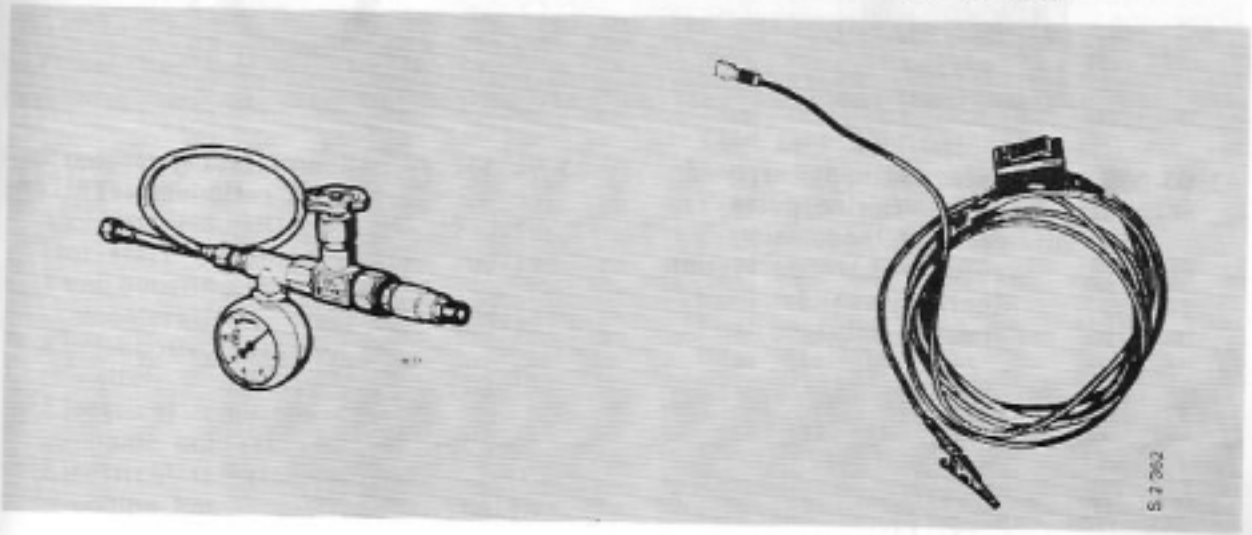


83 92 482 CO adjusting key

83 93 852 (A) Pressure gauge set for measuring fuel pressure in the LH system.

83 93 860 Spare set of hoses for gauge set 83 93 852.

83 93 878 Connector (spare part for gauge set 83 93 852).



83 92 516 Fuel pressure gauge set (complete) for CI system

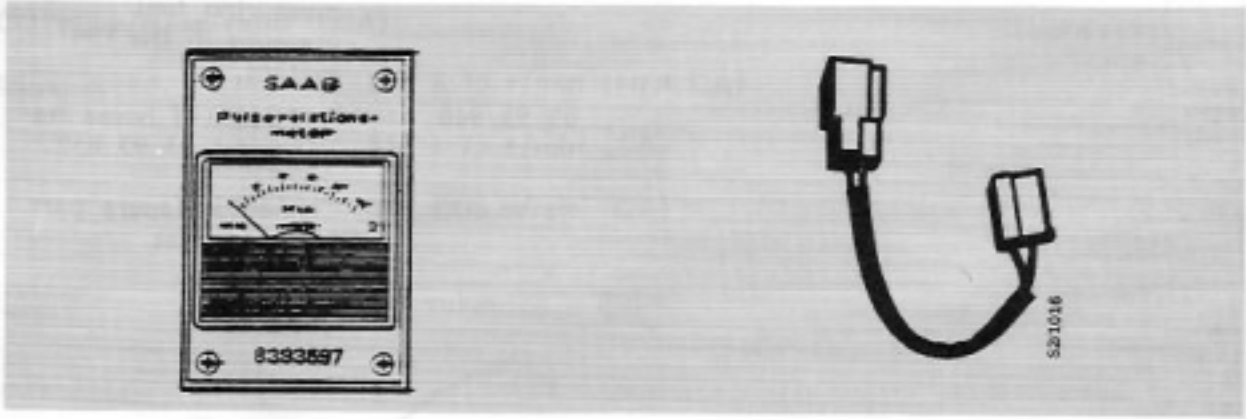
83 92 607 Hose

83 92 615 Fitting

83 93 886 (A2) Jumper lead for forced operation of fuel pump during LH system fault diagnosis

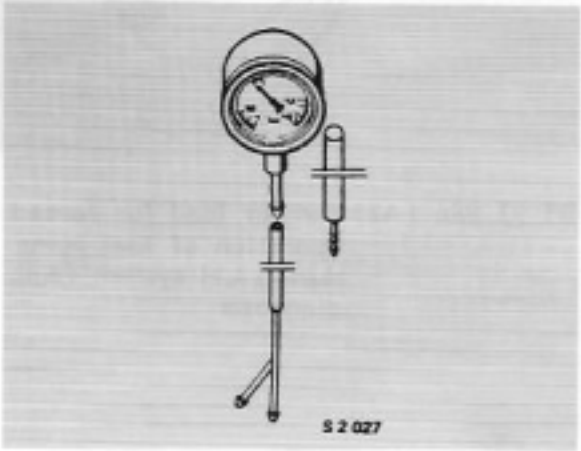
83 93 183 Test hose for CI system

83 93 894 (A2) Jumper earthing lead for fault-tracing in the LH system.



83 93 597 Pulse ratio meter used for measuring pulse ratio of modulating valve in Lambda system (certain vehicle specs. only).

83 94 132 Loom for connection of pulse ratio meter.



83 93 514 Pressure gauge set

Technical description

CI Fuel injection system B201 injection engine . . 200-2

LH Fuel injection system B202 injection engine . . 200-30

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- Warm-up regulator 200-10
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- Inlet manifold 200-40
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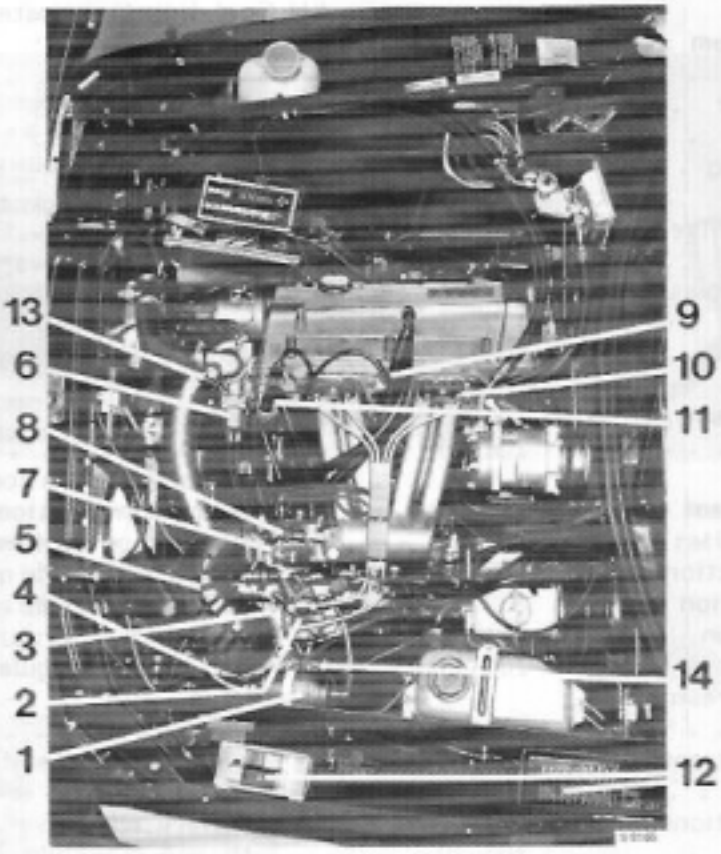
CI Fuel injection system
B201 injection engine

General

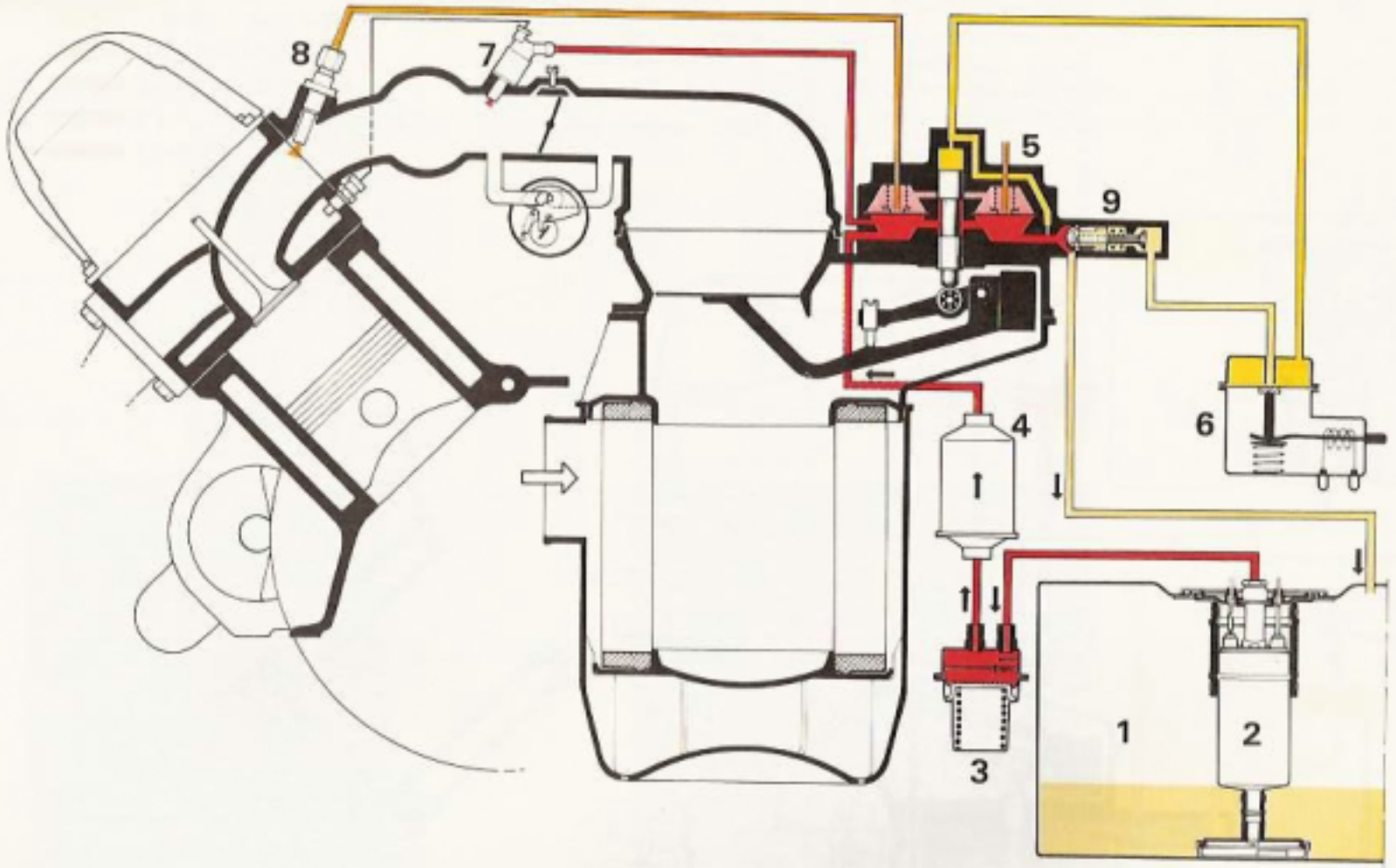
The injection system for the engine is the Bosch CI (Continuous Injection) system.

An electric fuel pump delivers fuel at constant pressure to the fuel distributor. The air flow sensor, which measures the flow of air to the engine, acts mechanically on the fuel distributor, thereby ensuring that the correct amount of fuel is metered to the four injection valves. The fuel is injected continuously into the inlet manifold immediately upstream of the inlet valves.



B201 engine

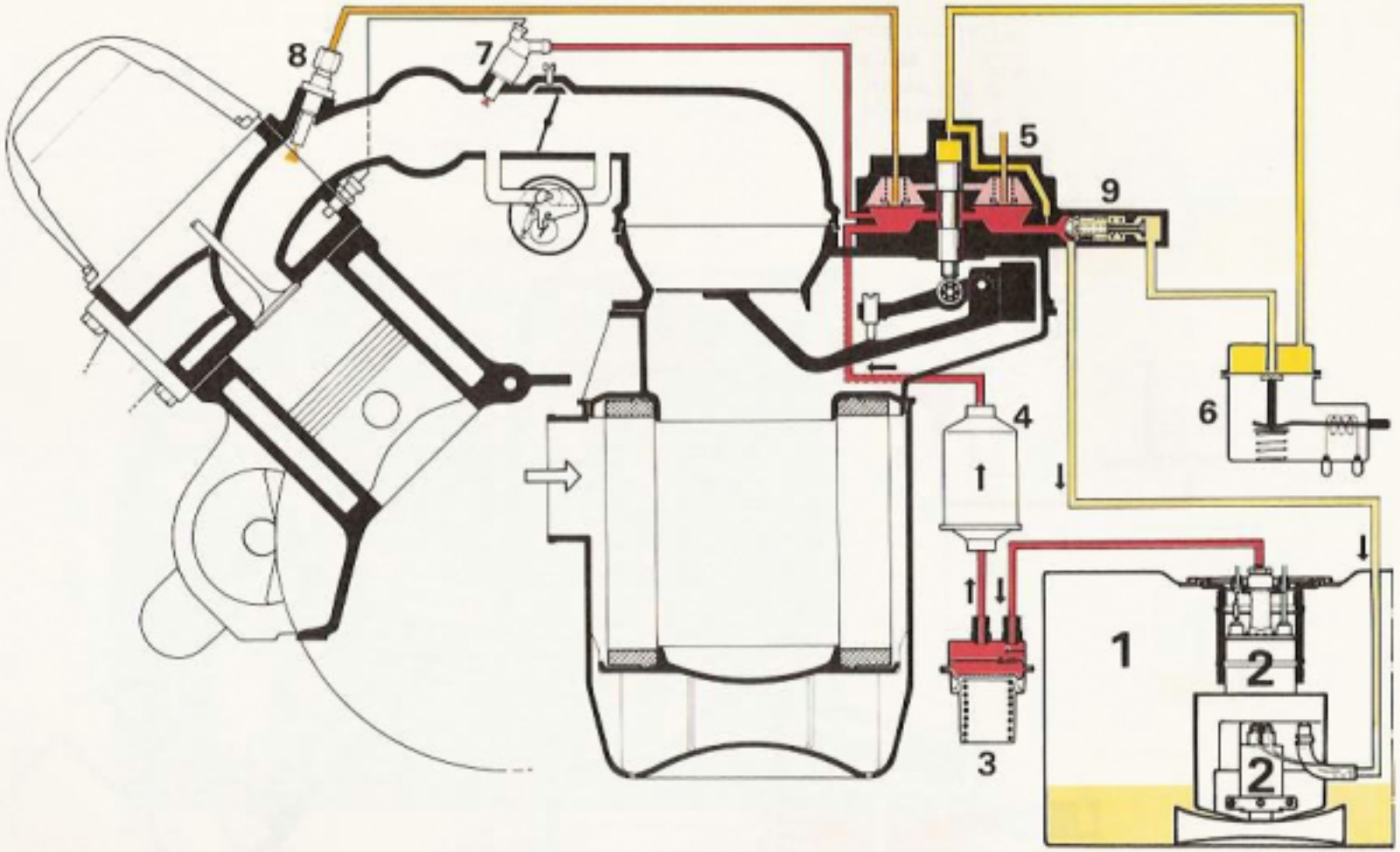
1. Fuel filter
2. Fuel distributor
3. Air flow sensor
4. Air cleaner
5. Rubber bellows
6. Control-pressure (warm-up) regulator
7. Throttle housing
8. Cold start valve
9. Temperature-sensing time switch
10. Injection valves
11. Auxiliary air valve
12. Fuses and relay panel
13. Thermostatic switch
14. Pressure impulse switch



Line pressure
Line pressure - 0.1 bar
Injection pressure
Control pressure
Return, no pressure

Fuel system

1. Fuel tank
2. Fuel pump
3. Fuel accumulator
4. Fuel filter
5. Fuel distributor
6. Warm-up regulator
7. Cold start valve
8. Injection valves
9. Line pressure regulator



Line pressure
Line pressure - 0.1 bar
Injection pressure
Control pressure
Return, no pressure

Fuel system (USA spec.)

1. Fuel tank
2. Fuel pump
3. Fuel accumulator
4. Fuel filter
5. Fuel distributor
6. Warm-up regulator
7. Cold start valve
8. Injection valves
9. Line pressure regulator