Checking lambda control

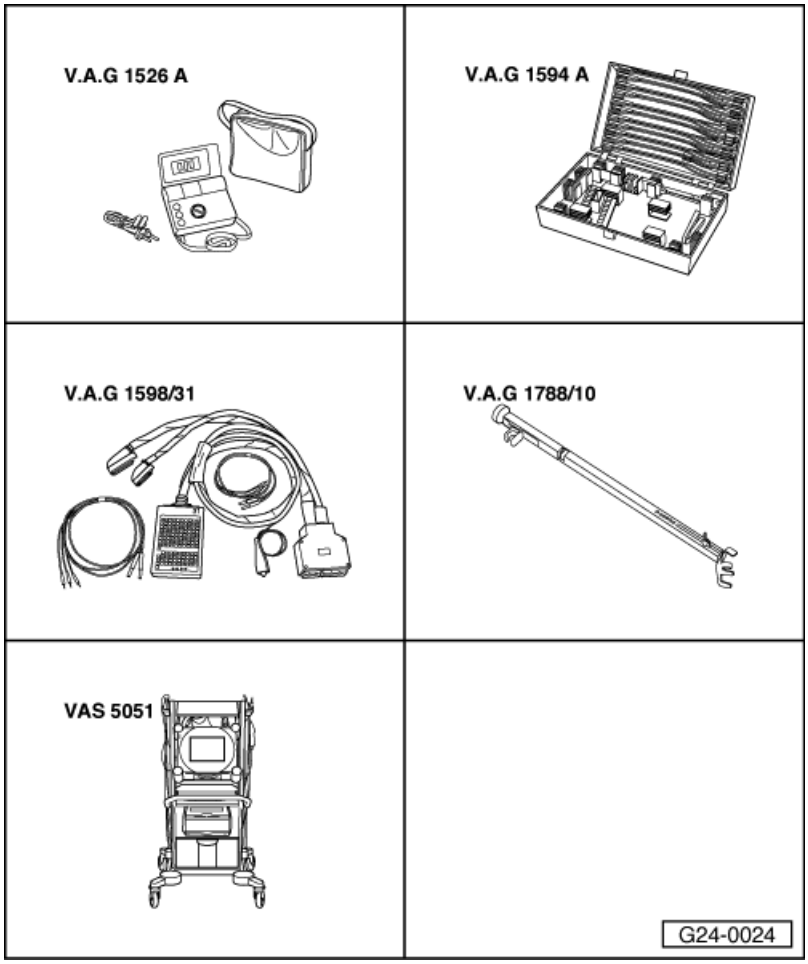
Checking lambda control and lambda probe -G130 and -G131 downstream of catalytic converter

Special tools and workshop equipment required

- V.A.G 1526 A
- V.A.G 1594 A
- V.A.G 1598/31
- V.A.G 1788/10
- VAS 5051 with VAS 5051/1

or

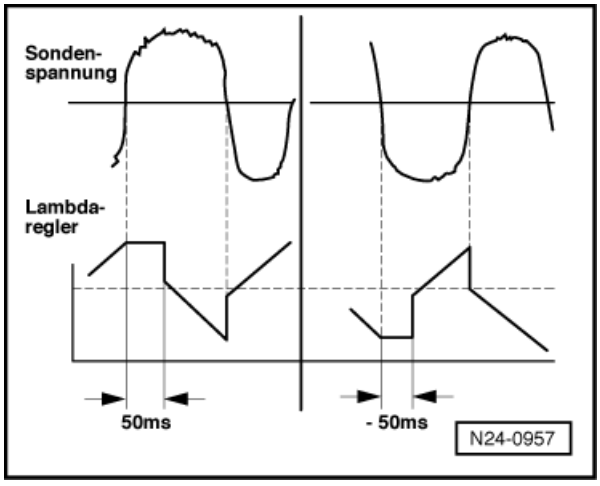
- V.A.G 1551 with V.A.G 1551/3 A



Note:

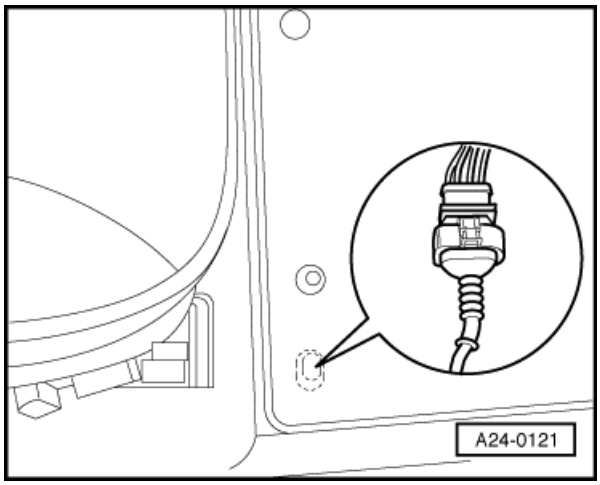
The lambda control downstream of the catalytic converter has priority over the lambda control upstream of the catalytic converter and is used as correction control.

→ It corrects slight mixture changes (e.g. enriches) through the lambda probe upstream of catalytic converter, by maintaining the lambda control for a certain period (dwell time) at the upper / lower point. If the time is in the positive range (e.g. 50 ms), the mixture is made richer. If it is in the negative range (e.g. -50 ms), the mixture is made leaner.

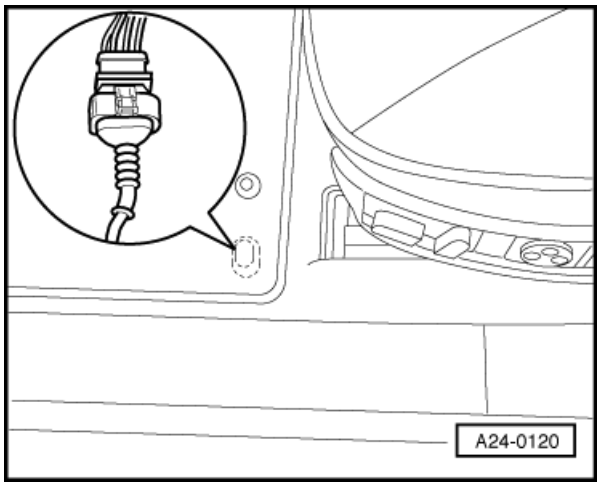


Fitting location of connector for lambda probe 2 downstream of catalytic converter:

→ The four-way connector for the lambda probe 2 (G130) bank 1 is under the mat on the passenger side.



→ The four-way connector for lambda probe 2 (G131) bank 2 is under the mat on the driver's side.



Test conditions

- Perform road test and do not erase fault memory.
- Coolant temperature at least 85 °C.

Test sequence

- Connect the vehicle diagnostic, testing and information system VAS 5051 or fault reader V.A.G 1551 and select engine electronics control unit 1 with "Address word" 01 => Page 01-15. For this purpose, the engine must be running at idling speed.

→ Indicated on display

Rapid data transfer HELP Select function XX

- Enter "04" to select "Start basic setting" and confirm with Q key.

Note:

During basic setting, the solenoid valve for the activated charcoal filter (valve -N80) is closed and the air conditioner compressor is switched off.

→ Indicated on display

Initiate basic setting Q Enter display group number XXX

- Enter "034" for "display group number 034" and confirm entry with Q key.

→ Indicated on display

System in basic setting 34 ⇒ 1 2 3 4

- Set engine speed to 2800...3200 rpm using engine speed controller V.A.G 1788/10.
- Perform the test as soon as an exhaust gas temperature above 200°C is attained in display zone 2.

Note:

This process can take a few minutes.

- Press C key.
- Set engine speed to 1900...2400 rpm using engine speed controller V.A.G 1788/10.

→ Indicated on display

Initiate basic setting Q
Enter display group number XXX

- Enter "030" for "display group number 030" and confirm entry with Q key.

→ Indicated on display

System in basic setting 30 ⇒
1 2 3 4

- Check lambda probe status for lambda probe downstream of catalytic converter in display zones 2 and 4.

Note:

The "Lambda probe status" indicates the condition of the lambda control and the lambda probes.

	Display zones			
	1	2	3	4
Display group 030: Lambda status at idle				
Display	X X X	**X X X**	X X X	**X X X**
Display	Lambda probe status, bank 1, probe 1	**Lambda probe status bank 1, probe 2**	Lambda probe status, bank 1, probe 2	**Lambda probe status bank 2, probe 2**
Range	0 = off 1 = on	**0 = off 1 = on**	0 = off 1 = on	**0 = off 1 = on**
Specified value	1 1 1	**1 1 1**	1 1 1	**1 1 1**
Note	**Explanation of display => Page 24-114**			

Notes:

- ◆ The lambda control of lambda probe downstream of catalytic converter (bank 1-probe 2 and bank 2-probe 2) is not active without engine load.
- ◆ The first digit of the 3-digit display (heating) fluctuates between 0 and 1.
- ◆ The third digit of the 3-digit display (lambda control) fluctuates between 0 and 1.

Significance of 3 digit readout of display group 30

1	1	1	**Display zones 1 to 4**
		X	Lambda control 0 = inactive 1 = active
	X		Lambda probe condition 0 = inactive 1 = active
X			Condition of lambda probe heating 0 = inactive 1 = active

Checking lambda control downstream of catalytic converter

- Carry out a road test lasting at least 10 minutes.

→ Indicated on display

Initiate basic setting Q
Enter display group number XXX

- Enter "037" for "display group number 037" and confirm entry with Q key.

→ Indicated on display

System in basic setting 37 ⇒
1 2 3 4

- Check lambda probe voltage in display zone 2.
- Check dwell time between lambda probe 1 upstream of catalytic converter and lambda probe 2 downstream of catalytic converter in display zone 3 and diagnosis result in display zone 4.

	Display zones			
	1	2	3	4
Display group 037: Diagnosis, lambda control system (Bank 1)				
Display	xxx %	**x.xxx volts**	**xxx ms**	**Test ON**
Display	Engine load	**Voltage of lambda probe downstream of catalytic converter, bank 1**	**Lambda correction value between lambda probe 1 and lambda probe 1, bank 2**	**Diagnosis status**
Range	15...150 %	**0...10.000 V**	**-1200...1200 ms**	**Test OFF Test ON Syst. OK Syst. NOK**
Specified value	14...24 %	**0...10.000 V**	**-800...800 ms**	**Syst. OK**
Note		**If specified value is not attained: Evaluation, display zone 2 =>Page 24-112.**	**If specified value is not attained: Continued =>Page 24-113.**	**If "Syst. NOK" is displayed: Interrogate fault memory => Page 24-113.**

Note on display zone 3:

The lambda control downstream of the catalytic converter has priority over the lambda control upstream of the catalytic converter and is used as a guidance control. It corrects slight rich / lean mixture changes in the lambda probe upstream of catalytic converter, by maintaining the lambda control upstream of catalytic converter at the upper / lower point for a certain period of time (dwell time). If the time is in the positive range (e.g. 50 ms), the mixture is made richer. If it is in the negative range (e.g. -50 ms), the mixture is made leaner.

- Press the Ckey.
- Press keys 0, 3 and 8 for "display group number 38" and confirm entry with Q key.

→ Indicated on display:
(1...4 = display zones)

System in basic setting 38 ⇒
1 2 3 4

	Display zones			
	1	2	3	4
Display group 038: Lambda control system diagnosis (Bank 2)				
Display	xxx %	**x.xxx volts**	**xxx ms**	**Test ON**
Display	Engine load	**Voltage of lambda probe downstream of catalytic converter, bank 2**	**Lambda correction value between lambda probe 1 and lambda probe 2, bank 2**	**Diagnosis status**
Range	15...150 %	**0.000...1.000 volts**	**-1200...1200 ms**	**Test OFF Test ON Syst. OK Syst. NOK**

Specified value	14...24 %	**0...10.000 V**	**-800...800 ms**	**Syst. OK**
Note		**If specified value is not attained: Evaluation, display zone 2 =>Page 24-112.**	**If specified value is not attained: Continued =>Page 24-113.**	**If "Syst. NOK" is displayed: Interrogate fault memory => Page 24-113.**

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Evaluation of display groups 037 and 038

Display group 37/38 Display zone: 2	Possible causes of fault	Fault remedy
approx. 0.450 V	- Open circuit in wire 4 between lambda probe and control unit - Open circuit in wire 3 between lambda probe and control unit	- Check signal wiring and actuation => Page 24-122
	- Lambda probe heating defective - Lambda probe defective	- Check lambda probe heating =>Page 24-114. Fit a new lambda probe
Greater than 1.100 V	- Short to positive in wire 4 between lambda probe and control unit	- Check lambda probe wiring bank 1, lambda probe 2 (downstream of catalytic converter) => Page 24-126
Less than 0.100 V	- Short to earth in wire 4 between lambda probe and control unit - Short circuit between wires 3 and 4	- Check lambda probe wiring bank 2, lambda probe 2 (downstream of catalytic converter) => Page 24-130

Cont.

If specification in display zone 3 or 4 is not attained:

- Check for air leak at exhaust or catalytic converter (check screw clamps and exhaust for damage)
- Replace appropriate lambda probe "upstream of" catalytic converter.