Readiness code

The readiness code appears as an 8-digit display in measuring value block 086, display field 1. Each of the 8 digits is allocated to a specific exhaust related system.

During a test sequence which must be performed completely, On Board Diagnostic (OBD) checks the function of each of these systems and then changes the character assigned to it in the 8-digit indication from "1" to "0" once test has been performed successfully.

When the readiness code is generated after a successfully completed test sequence, it reads "0 0 0 0 0 0 0 0" (measuring value block 086, display field 1).

If a single test is completed entirely, but indicated as "not OK", a DTC will be stored in DTC memory. Check DTC Memory ⇒ Page 01-12 .

01-78

Readiness code is returned to "0 1 1 0 1 1 0 1" if:

- DTC memory was erased,
- Voltage supply to ECM was cut off (e.g. connector disconnected, battery disconnected)
- a new Engine Control Module (ECM) was installed

In this case, readiness code must be re-generated ⇒ Page 01-84 .

Note:

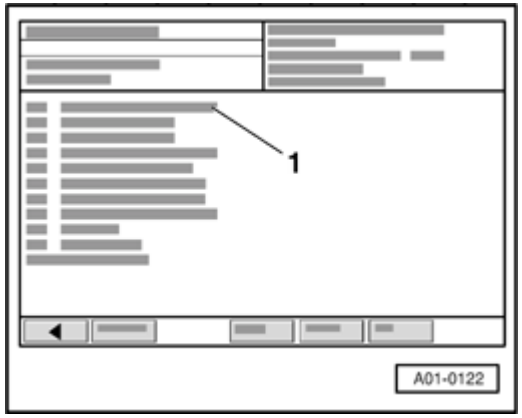
During driving operation in various load conditions, exhaust relevant tests are performed by the control module and the readiness code is generated on its own. In this case, however, the concluding control possibilities are not available, meaning that it will not be indicated whether the vehicle is free of malfunctions upon transfer to the customer.

01-79

Readiness code, checking

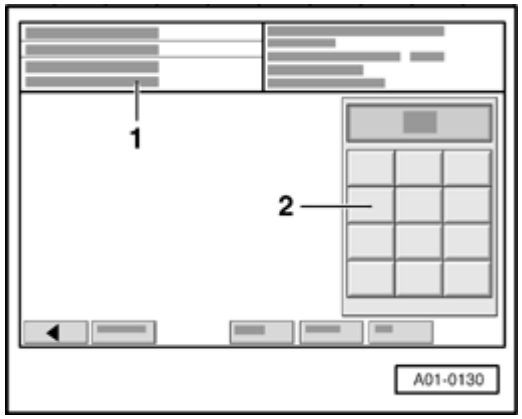
Test sequence

- Connect VAS5051 tester ⇒ Page 01-7 and select vehicle system "01 - Engine electronics". Engine must run at idle for this.



➢ Display on VAS5051:

- Select diagnostic function "08 - read measured value block" in selection -1-.



➢ Display on VAS5051:

1 - Enter display group Max. input value = 255

- Select function "086" in button field -2- for "Display group number 086" and press Q button to confirm input.

01-80

➢ Display on VAS5051:

- Check readiness code in display field -1-.
  - ♦ Specification: 0 0 0 0 0 0 0 0

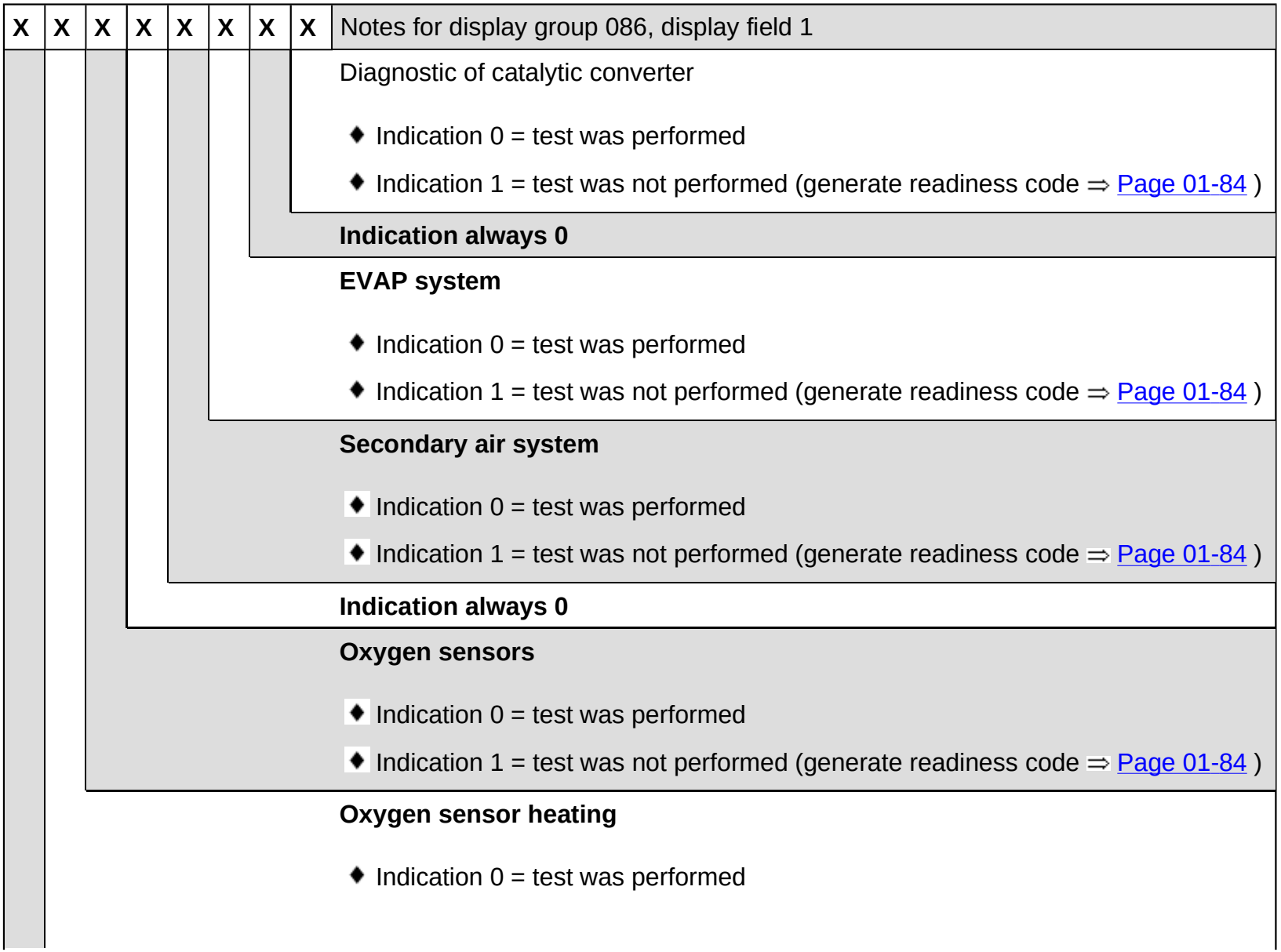
01-81

	Display fields			
	1	2	3	4
Display group 086: Readiness code				
Display	**0 0 0 0 0 0 0 0**	X X X X X X X X	X X X X X X X X	
Indicated	**Ready-Bits** **completed tests**	individual tests carried out	individual tests carried out	
Functional range	**1 = not completed** **0 = completed**	1 = not completed 0 = completed	1 = not completed 0 = completed	
Specified value	**0 0 0 0 0 0 0 0**	X X X X X X X X	X X X X X X X X	
Note	**Significance of readiness code ⇒ Page 01-82**			

Note for display field 1:

Display field 1 is the most important. This indicates which system was checked via On Board Diagnostic (OBD) since the last time DTC memory was erased or a new control module was implemented. Once DTC memory is erased, all testable values are set to "1", after the test is performed successfully, the values are set to "0".

01-82


X X X X X X X X
Notes for display group 086, display field 1
Diagnostic of catalytic converter
Indication 0 = test was performed
Indication 1 = test was not performed (generate readiness code ⇒ Page 01-84)
Indication always 0
EVAP system
Indication 0 = test was performed
Indication 1 = test was not performed (generate readiness code ⇒ Page 01-84)
Secondary air system
Indication 0 = test was performed
Indication 1 = test was not performed (generate readiness code ⇒ Page 01-84)
Indication always 0
Oxygen sensors
Indication 0 = test was performed
Indication 1 = test was not performed (generate readiness code ⇒ Page 01-84)
Oxygen sensor heating
Indication 0 = test was performed

- Indication 1 = test was not performed (generate readiness code ⇒ Page 01-84)

Indication always 0

Note:

Readiness code is not generated until all indications in display field 1 display "0"

01-83

Once the specified value "0 0 0 0 0 0 0 0" is reached in display field 1:

- Click on ◀ - button

- Check DTC memory as a control measure ⇒ Page 01-12 (there must not be any DTCs stored)

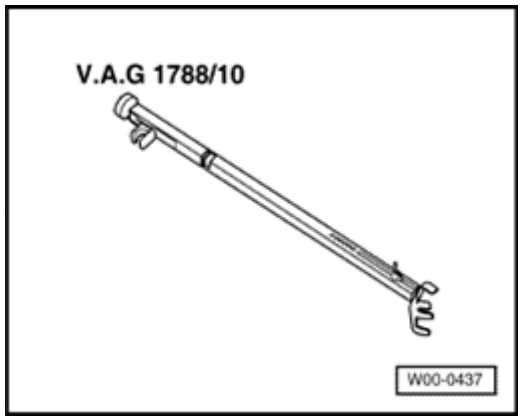
If specified value is not obtained:

- Generate readiness code ⇒ Page 01-84 .

01-84

Readiness code, generating

Special Tools and Equipment



- VAG1788/10 RPM adjuster

Requirements

- Vehicle stationary
- Vehicles with automatic transmission Selector lever in P or N.
- Electrical consumers switched off (radiator fan must NOT run during test).
- A/C switched off.
- Coolant temperature at least 80 ° C ⇒ Display group 004, display field 3. Important: Drive engine warm via road test if possible.

Important note:

If, during a work step, the test result is indicated as "OK" immediately after selecting a display group, the test has already been carried out and it is OK to continue on to the next work step.

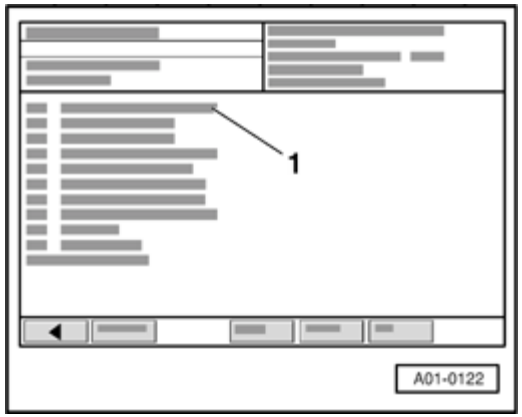
01-85

Work step 1: Check DTC Memory

Test requirement:

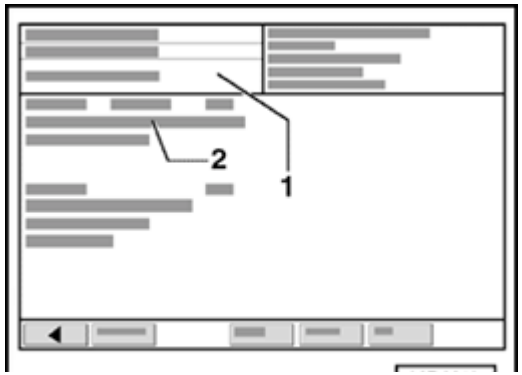
- Engine not running, ignition switched on.

- Connect VAS5051 tester ⇒ Page 01-7 and select vehicle system "01 - Engine electronics". Ignition must remain switched on for this.



➢ Display on VAS5051:

- In selection -1-, click on the diagnostic function "02 - Check DTC memory".



➢ Display on VAS5051:

1 - DTC memory content:

- ♦ 0 malfunctions recognized

or

- ♦ X malfunctions recognized

2 - Malfunction

- DTC
- malfunction location
- malfunction type

01-86

If a DTC is stored:

- Repair malfunction, erase DTC memory. Road test vehicle and then check DTC memory as a control measure.

If no DTCs are stored:

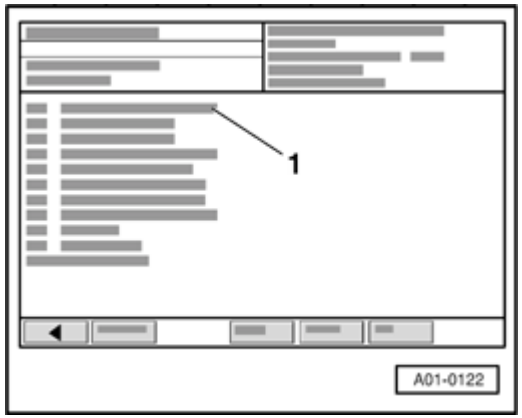
- Click on ◀ - button

01-87

Work step 2: Erase DTC Memory

Test requirement:

- Engine not running, ignition switched on.



Display on VAS5051:

- In selection -1-, click on the diagnostic function "05 - Check DTC memory".

Note:

When DTC memory is erased, readiness code is reset and must therefore be re-generated.

Display on VAS5051:

1 - ♦ no indication (before erasing)

or

♦ DTC memory erased

2 - Note:Perform the function?Note: Data is being erased !

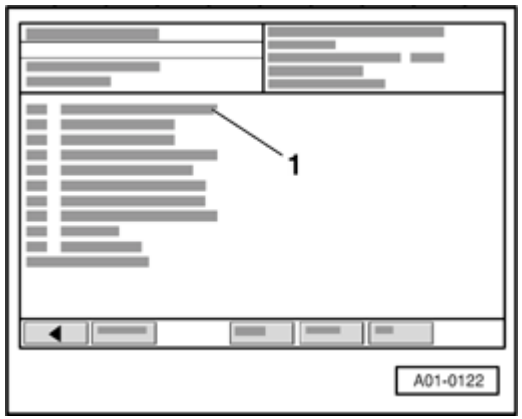
- Press on "OK" button in display -2-.
- Click on ◀ - button

01-88

Work step 3: Adapt throttle valve control module to Engine Control Module (ECM)

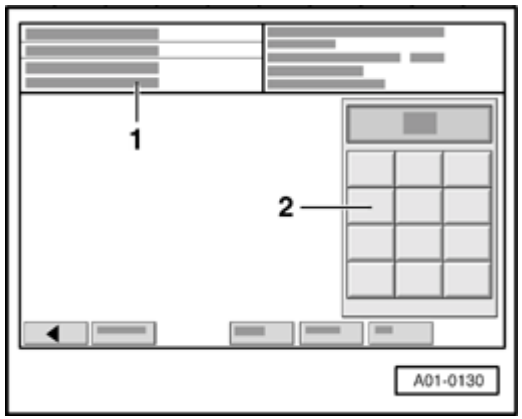
Test requirement:

- Engine not running, ignition switched on.



➢ Display on VAS5051:

- In selection -1-, click on the diagnostic function "04 - Basic setting".



➢ Display on VAS5051:

1 - Enter display group Max. input value = 255

- Select function "060" in button field -2- for "display group number 060" and press Q button to confirm input.

01-89

➢ Display on VAS5051:

- Check specified values in display fields -3- and -4-.

01-90

	Display fields			
	1	2	3	4
Display group 060: Adaptation of throttle valve control module				
Display	xx %	xx %	**x**	**---**
Indicated	Throttle valve angle (angle sensor 1)	Throttle valve angle (angle sensor 2)	**Adaptation step counter**	**Adaptation condition**
Functional range			**0 to 8**	**ADP in progress** **ADP OK** **ERROR**
Specified value	3 to 93 %	97 to 3 %	**8**	**ADP OK**
Note			**After adaptation, the adaptation step counter reaches the number 8 (it is OK for numbers to be skipped).**	**If "ERROR." is displayed: Check DTC memory ⇒ Page 01-12 .** **If specified value is not obtained: ⇒Note, ⇒ Page 24-130**

Note for display field 3:

Different numbers are shown in display field 3 during adaptation that represent the current adaptation condition. It is not particularly important how the adaptation step counter (display field 3) behaves during adaptation, but rather that display field

4 indicates the specification "ADP OK" after adaptation.

If specified value "ADP OK" is obtained:

- Perform next work step.

01-91

Work step 4: Kick down function, adapting[1)]

[1)] Only vehicles with automatic transmission

Test requirement:

- Engine not running, ignition switched on.

➢ Display on VAS5051:

- Press ▲ button 3 times to change into display group 063.

Note:

There will be a prompt: "Operate kick down".

- Depress accelerator pedal completely, past kick down point, and hold down.

Note:

During adaptation of the kick down point, "Kick down ADP in progress" will be indicated in display. After successful adaptation of the kick down point, "Kick down ADP OK" will be indicated on display.

- Check specified value in display field -4-.

01-92

	Display fields			
	1	2	3	4
Display group 063: Kick down function, adapting				
Display	xx %	xx %	**Kick down**	**---**
Indicated	Sensor 1 for Pedal position	learned kick down value for Throttle Position (TP) sensor	**Kick down**	**Adaptation condition**
Functional range			**Kick down**	**operate** **ADP in progress** **ADP OK** **ERROR**
Specified value	79 to 94 %	79 to 94 %	**Kick down**	**ADP OK**
Note				**If "ERROR." is displayed: Check DTC memory ⇒ Page 01-12 .**

Note for display field 4:

"ERROR" can be indicated, for example, if the accelerator pedal is not immediately pressed in response to a request by the tester or if the accelerator pedal is released while adaptation is running despite the fact that adaptation is not yet complete. In both cases, "Basic Setting" must be exited and the adaptation must be performed again.

If specified value "ADP OK" is obtained:

- Perform next work step.

01-93

Work step 5: Check operating condition of oxygen sensor control

- Start engine (for a vehicle with manual transmission: engage clutch).

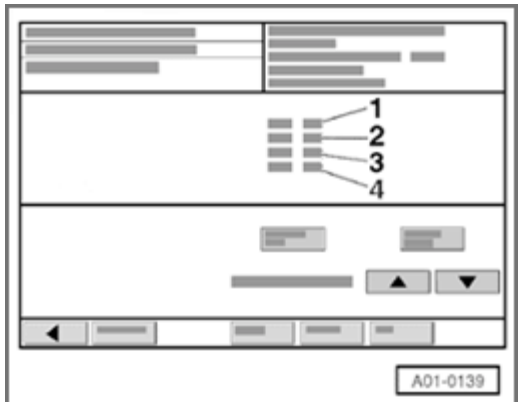
Note:

If necessary, vehicle system "01 - engine electronics" and diagnostic function "04 -basic setting" must be selected again after engine start.

- Install VAG1788/10 RPM adjuster on the accelerator pedal and raise the engine speed to 2600 RPM.

Test requirement:

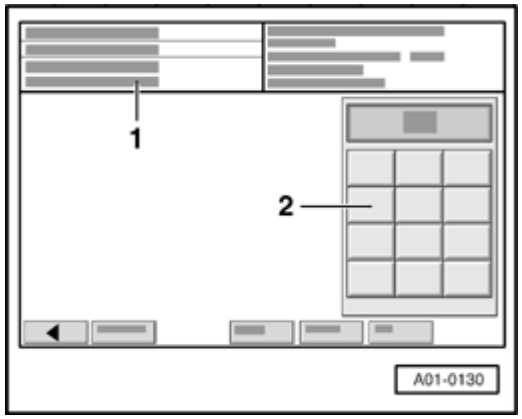
- Engine running at 2600 RPM.



➢ Display on VAS5051:

- Click on ◀ - button

01-94



Display on VAS5051:

1 - Enter display group Max. input value = 255

- Select function "030" in button field -2- for "display group number 030" and press Q button to confirm input.

Display on VAS5051:

- Check oxygen sensor status in display fields -1- and -2-.

Note:

A few minutes may pass until a diagnostic result is reached.

01-95

	Display fields			
	1	2	3	4
Display group 030: Oxygen sensor status				
Display	**X X X**	**X X X**		
Indicated	**Oxygen sensor status, bank 1, sensor 1**	**Oxygen sensor status, bank 2, sensor 1**		
Functional range	**0 = off** **1 = on**	**0 = off** **1 = on**		
Specified value	**1 1 1**	**1 1 0**		

Significance of 3 digit indications in display group 030			
X	X	X	**Display fields 1 and 2**
		X	Oxygen sensor control: 0= not active; 1 = active
	X		Operational readiness of oxygen sensor: 0= not active; 1 = active
X			Condition of oxygen sensor heater: 0= not active; 1 = active

Notes:

- *The first position of the 3 digit indication (heating) fluctuates between 0 and 1 at certain operation points.*
- *Oxygen sensor control of oxygen sensor behind catalytic converter (bank 1, sensor 2) is not active without engine load, meaning that the third position of the 3-digit display is 0.*

- Do not start test until indication in display field 1

has reached "111" at least once and indication in display field 2 has reached "110" at least once.

01-96

Work step 6: Diagnostic of oxygen sensor aging before catalytic converter

Test requirement:

- Engine continues to run at 2600 RPM.

➢ Display on VAS5051:

- Press ▲ button 4 times to change into display group 034.
- Check specified value in display field -4-.

Note:

A few minutes may pass until a diagnostic result is reached.

01-97

	Display fields			
	1	2	3	4
Display group 034: Oxygen sensor aging diagnostic, oxygen sensor before catalytic converter (bank 1)				
Display	xxxx/min	xxx ° C	x.x	**---**
Indicated	Engine speed (RPM)	Exhaust temperature	Dynamic factor	Diagnostic condition
Functional range				Test OFF Test ON B1-S2 OK B1-S2 not OK
Specified value	2600 RPM	larger than 350 ° C	0.5 to 2.5	B1-S2 OK
Note				**If "B1-S1 not OK" is displayed: Check DTC memory ⇒ Page 01-12 .**

If specified value "B1-S1 OK" is obtained:

- Perform next work step.

01-98

Work step 7: Diagnostic of operational readiness of oxygen sensor behind catalytic converter

Test requirement:

- Engine continues to run at 2600 RPM.

Display on VAS5051:

- Press ▲ button 2 times to change into display group 036.
- Check specified value in display field -2-.

01-99

	Display fields			
	1	2	3	4
Display group 036: Operational readiness of oxygen sensor behind catalytic converter (bank 1)				
Display	x.xxx V	**---**		
Indicated	Oxygen sensor voltage Bank 2, sensor 1	**Diagnostic condition**		
Functional range		**Test OFF** **Test ON** **B1-S2 OK** **B1-S2 not OK**		
Specified value	0.100 to 0.950 volts	**B1-S2 OK**		
Note		**If "B1-S2 not OK" is displayed: Check DTC memory ⇒ Page 01-12**		

If specified value B1-S2 OK" is obtained:

- Perform next work step.

01-100

Work step 8: Diagnostic of oxygen sensor control system

Test requirement:

- Engine continues to run at 2600 RPM.

➢ Display on VAS5051:

- Press ▲ button to change into display group 037.
- Check specified value in display field -4-.

01-101

	Display fields			
	1	2	3	4
Display group 037: Diagnostic of oxygen sensor control system (Bank 1)				
Display	xxx %	x.xxx V	x.xx	**---**
Indicated	Load	Oxygen sensor voltage Bank 2, sensor 1	Oxygen sensor correction value between bank 1, sensor 1 and bank 1, sensor 2	Diagnostic condition
Functional range				**Test OFF** **Test ON** **System OK** **System not OK**
Specified value	13 to 40 %	0.100 to 0.950 volts	smaller than 0.02	System OK
Note				**If "System not OK" is displayed: Check DTC memory ⇒ Page 01-12**

If specified value "Syst. OK" is obtained:

- Perform next work step.

01-102

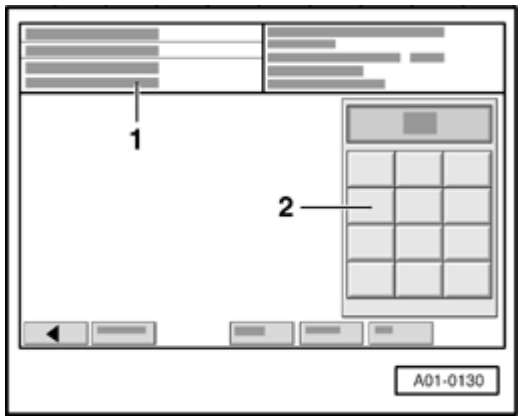
Work step 9: Diagnostic of oxygen sensor aging behind catalytic converter

Test requirement:

- Engine continues to run at 2600 RPM.

➢ Display on VAS5051:

- Click on ◀ - button



➢ Display on VAS5051:

1 - Enter display group Max. input value = 255

- Select function "043" in button field -2- for "display group number 043" and press Q button to confirm input.

01-103

➢ Display on VAS5051:

- Check specified value in display field -4-.

01-104

	Display fields			
	1	2	3	4
Display group 043: Oxygen sensor aging diagnostic, oxygen sensor behind catalytic converter (bank 1)				
Display	xxxx/min	xxx °C	x.xxx V	**---**
Indicated	Engine speed (RPM)	Exhaust temperature	Oxygen sensor voltage Bank 2, sensor 1	Diagnostic condition
Functional range				Test OFF Test ON B1-S2 OK B1-S2 not OK
Specified value	2600 RPM	larger than 350 °C	0.100 to 0.950 volts	B1-S2 OK
Note				**If "B1-S2 not OK" is displayed: Check DTC memory ⇒ Page 01-12**

If specified value B1-S2 OK" is obtained:

- Perform next work step.

01-105

Work step 10: Diagnostic of catalytic converter

Test requirement:

- Engine continues to run at 2600 RPM.

➢ Display on VAS5051:

- Press ▲ button 3 times to change into display group 046.
- Check specified values in display fields -2- and -4-.

Note:

Catalytic converter diagnostic lasts approx. 60 seconds.

01-106

	Display fields			
	1	2	3	4
Display group 046: Diagnostic of catalytic converter (bank 1)				
Display	xxxx/min	**xxx °C**	x.xx	**---**
Indicated	Engine speed (RPM)	**Exhaust temperature**	Measurement Catalytic converter - conversion	Diagnostic condition
Functional range			0 to 8	Test OFF Test ON Cat B1 OK Cat B1 not OK
Specified value	2600 RPM	**550 to 700 °C**	Larger than 1.0	Cat B1 OK
Note		**As long as the exhaust temperature is not within the specified range, the test will not be initiated. If necessary, increase or decrease RPM**		**If "Cat B1 not OK" is displayed: Check DTC memory ⇒ Page 01-12 . If no DTCs are stored, replace catalytic converter.**

If specified value "Cat B1 OK" is obtained:

- Perform next work step.

01-107

Work step 11: Diagnostic of tank ventilation valve

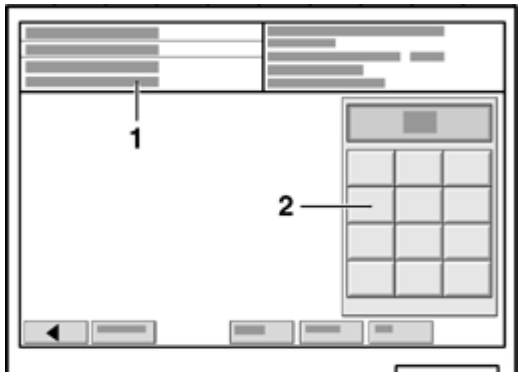
- Remove the VAG1788/10 RPM adjuster and leave engine running at idle.

Test requirement:

- Engine running at idle:

➢ Display on VAS5051:

- Click on ◀ - button



➢ Display on VAS5051:

1 - Enter display group Max. input value = 255

- Select function "070" in button field -2- for "display group number 070" and press Q button to confirm input.

01-108

➢ Display on VAS5051:

- Check specified value in display field -4-.

Note:

If test is not initiated or if indication switches from "Test ON" to "Test OFF", depress accelerator pedal briefly, test will be repeated.

01-109

	Display fields			
	1	2	3	4
Display group 070: Diagnostic of tank ventilation valve				
Display	xx %	xx %		**---**
Indicated	Degree tank ventilation valve is opened	Oxygen sensor control Diagnostic value		**Diagnostic condition**
Functional range				**Test OFF** **Test ON** **TVV OK** **TVV not OK** **Aborted**
Specified value	0 to 99 %	less than -7 % or greater than 7 %		**TVV OK**
Note				**If "TVV not OK" is displayed: Check DTC memory ⇒ Page 01-12 . Check Evaporative Emission (EVAP) canister purge regulator valve -N80- ⇒ Page 24-114**

If specified value "TVV OK" is obtained:

- Perform next work step.

01-110

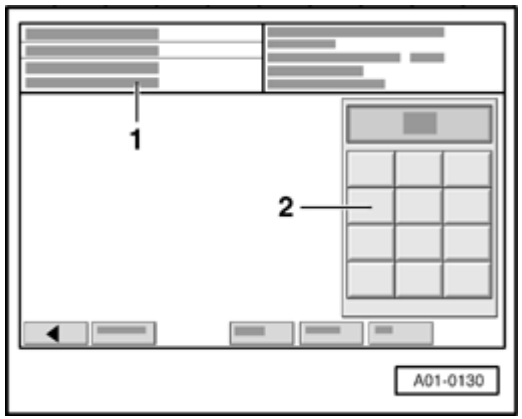
Work step 12: Diagnostic of Secondary Air Injection (AIR) system

Test requirement:

- Engine running at idle:

➢ Display on VAS5051:

- Click on ◀ - button



➢ Display on VAS5051:

1 - Enter display group Max. input value = 255

- Select function "077" in button field -2- for "display group number 077" and press Q button to confirm input.

01-111

➢ Display on VAS5051:

- Depress gas pedal completely (swiftly) and then release it (brief acceleration of at least 2500 RPM).
- Check specified value in display field -4-.

Note:

Secondary Air Injection (AIR) system test lasts approx. 60 seconds.

01-112

	Display fields			
	1	2	3	4
Display group 077: Secondary Air Injection (AIR) system diagnostic (Bank 1)				
Display	xxxx/min	xx.x g/s	xx %	**---**
Indicated	Engine speed (RPM)	Air mass	Relative air mass bank 1, Secondary Air Injection (AIR) system	**Diagnostic condition**
Functional range				**Test OFF** **Test ON** **System OK** **System not OK** **Aborted**
Specified value	FWD: 740 to 860 RPM AWD: 760 to 880 RPM	2 to 5 g/s	more than -20 %	System OK
Note				**If "System not OK" is displayed: Check DTC memory ⇒ Page 01-12**

If specified value "Syst. OK" is obtained:

- Click on ◀ - button

Work step 13: Read readiness code

- Read readiness code ⇒ Page 01-79 .