

Volkswagen – Audi OBD-II Readiness Code Charts



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Snap-on[®]

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Safety Information

For your safety and the safety of others, read, understand and follow all safety messages and instructions in this manual, on the test equipment and in the tool user's manual.

Your diagnostic tool is intended for use by properly trained, skilled professional automotive technicians. The safety messages presented below and throughout this manual are reminders to the operator to exercise extreme care when using a test instrument.

There are many variations in procedures, techniques, tools, and parts for servicing vehicles, as well as in the skill of the individual doing the work. Because of the vast number of test applications and variations in the products that can be tested with this instrument, we cannot possibly anticipate or provide advice or safety messages to cover every situation. It is the responsibility of the automotive technician to be knowledgeable of the system being tested. It is essential to use proper service methods and test procedures and to perform tests in an appropriate and acceptable manner that does not endanger your safety, the safety of others in the work area, or vehicle or equipment being tested.

It is assumed the operator has a thorough understanding of vehicle systems before using a diagnostic tool. Understanding of these system principles and operating theories is necessary for competent, safe and accurate use of this instrument.

Before using a diagnostic tool, always refer to and follow safety messages and applicable test procedures provided by the manufacturer of the vehicle or equipment being tested. Use equipment only as described in this manual.

Safety Conventions

Safety messages in this manual contain a signal word with an icon. The signal word indicates the level of the hazard in a situation. Signal words used in this manual are explained below.

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury to the operator or bystanders.

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to the operator or to bystanders.

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in moderate or minor injury to the operator or to bystanders.

Safety messages contain three different type styles:

- Normal type states the hazard.
- **Bold** type states how to avoid the hazard.
- *Italic* type states the possible consequences of not avoiding the hazard.

An icon, when present, gives a graphical description of the potential hazard. An example is shown below.



Risk of unexpected vehicle movement.

- **Block drive wheels before performing a test with the engine running.**

A moving vehicle can cause injury.

A universal warning triangle is used when an icon for the specific hazard is not available. In these instances, the safety message is preceded by the signal word in bold type. An example is shown below.



The engine compartment contains electrical connections and hot or moving parts.

- **Keep yourself, test leads, clothing, and other objects clear of electrical connections and hot or moving parts.**
- **Do not wear watches, rings, or loose clothing when working in an engine compartment.**
- **Do not place tools or equipment on fenders or other places in the engine compartment.**
- **Barriers are recommended to help identify danger zones in test area.**

Contact with electrical connections and hot moving parts can cause injury.

Important Safety Instructions

For a complete list of safety messages, refer to the Safety Chapter in the user's manual for the diagnostic tool associated with this software product.

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Chapter 1: Introduction

OBD-II Overview

On-Board Diagnostics, starting with the OBD-I system, verifies the normal operation of sensors and actuators by measuring voltage drop at the component. This technique for confirmation of operation is known as a component monitor. This method can be used to determine short circuits to positive, short circuits to ground, and open circuits.

OBD-II systems, the next generation, monitor inputs and outputs (sensors and actuators) in the same manner as OBD-I systems, but add comprehensive new processes that include:

- Plausibility of signals and components of emissions-related functions.
- Monitors on functions not completely monitored previously.
- Monitors on systems not monitored previously.

Monitors, as used in this context, can take one of two forms:

- **Component monitors**—The engine control module (ECM) looks at the operation of individual parts of the system.
- **System monitors**—The ECM operates a component (or multiple components) to verify system operation.

OBD-II Drive Cycle

The OBD-II Drive Cycle (see page 3) can be used to drive the vehicle in a prescribed manner which will run and set both component and emission system monitors, which are called readiness monitors.

Examples of readiness monitors include:

- Exhaust gas recirculation (EGR)
- Secondary air injection (AIR)
- Evaporative emission (EVAP)
- Misfires
- Fuel delivery
- Oxygen sensor (O2S)
- Catalytic converter (CAT)

Each monitor requires specific operating conditions or enabling criteria to be met before a test is initiated. In most cases, the monitors should run and set during normal vehicle operation. However, due to different driving habits, enabling criteria may not always be met for every monitor.



NOTE:

The OBD-II Drive Cycle can be time-consuming and may not be practical in many urban environments.

OBD-II Drive Cycle Stages

The OBD-II Drive Cycle is an eight-stage course, as illustrated in the chart on page 3. An explanation of each step is provided below.

Stage 1: Cold Start—The ECM determines the presence of a cold start by comparing the engine coolant temperature to the ambient air temperature during startup. The engine is considered cold when:

- Engine coolant temperature is below 122°F (50°C).
- Engine coolant and intake air temperatures are within 11°F (6°C) of each other at startup.



NOTE:

Do not leave the key on prior to the cold start or the oxygen sensor (O2S) heater monitor may not run.

During this period, the O2S heater, misfire, AIR, fuel system, and EVAP monitors run.

Stage 2: Idle 2½ Minutes—Turn the air conditioning (A/C) and headlights on to help the misfire monitor—the additional electrical loads help even out combustion pulses. During this period, the O2S heater, AIR, EVAP, misfire, and possibly fuel system (if operating in closed loop) monitors run.

Stage 3: Accelerate—Prior to accelerating, turn off the A/C and headlights (if possible). Open the throttle halfway until you reach 55 MPH (89 KPH). During acceleration, the misfire, fuel system, and EVAP monitors run.

Stage 4: Steady State Cruise—During this portion of the cycle, the O2S, AIR, EGR, EVAP, misfire, and fuel system monitors run.

Stage 5: Decelerate—Gradually coast down without applying the brakes. Also, on manual transmission vehicles, remain in high gear and do not press the clutch. During this period, the EGR, EVAP, and fuel system monitors run.

Stage 6: Accelerate—Apply ¾ throttle until reaching 60 MPH (97 KPH). During acceleration, the misfire, fuel system, and EVAP monitors run.

Stage 7: Steady State Cruise—During this period, the CAT, O2S, AIR, EGR, EVAP, misfire, and fuel system monitors run.



NOTE:

If the CAT is marginal and the battery was disconnected prior to the Drive Cycle, it may take up to five separate Drive Cycles in order to determine the state of the CAT.

Stage 8: Decelerate—Gradually coast down without applying the brakes. Also, on manual transmission vehicles, remain in high gear and do not press the clutch. During this portion of the Drive Cycle, the EGR, EVAP, and fuel system monitors run.

VW/Audi OBD-II Readiness Codes

VW and Audi documentation refers to “Setting Readiness Codes,” which means running and completing the OBD-II Readiness Monitors (all monitors that have run and passed are indicated by a “Ready” status). The VW/Audi Readiness charts are designed to instruct the technician to use the scan tool to run one or more of the eight Readiness Monitors (Codes) as listed in Table 1-1, “Readiness code digit chart,” on page 4. The scan tool has the capability to command the ECM to run readiness code diagnostic tests in a special operational mode called “Basic Settings.” If these tests run successfully, all eight Readiness Monitors (Codes) will be set to “Ready” or “0”. In most cases, these charts will eliminate the need to drive the OBD-II drive cycle because these tests are designed to run with the vehicle stationary.

The other alternative is driving the OBD-II Drive Cycle (page 3) or generic road test (page 21) which will also set the readiness monitors but is not always practical, requiring very exact operating conditions for each monitor to run. Readiness code status is now part of some state emission programs. The vehicle will fail if any of these monitors have not passed. In addition, repair work can be validated if readiness code tests are run successfully.

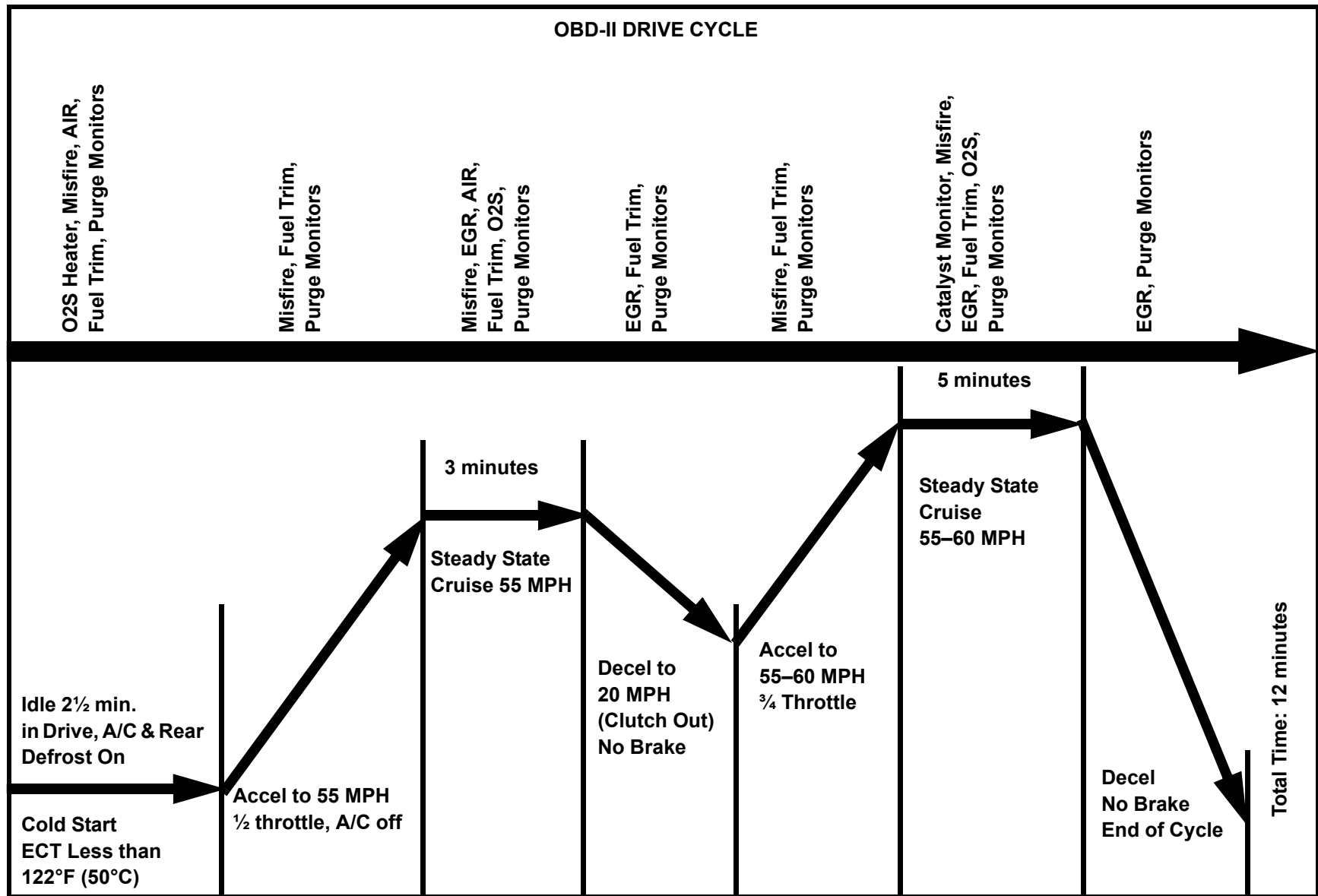


Table 1-1. Readiness code digit chart

1	2	3	4	5	6	7	8	Diagnostic Function
							0	Catalytic converter
						0		Catalytic converter heating (no diagnostic yet, always “0”)
					0			EVAP canister system (tank ventilation system)
				0				Secondary air injection (AIR) system
			0					A/C system (no diagnostic yet, always “0”)
		0						Oxygen sensor
	0							Oxygen sensor heating
0								EGR (not available, always “0”)
An OK readiness status is represented by a “0”. A Not OK status is represented by a “1”.								

Note the following regarding VW/Audi readiness codes:

- Table 1-1 does not apply to diesel engines. See “Diesel Engines” on page 69.
- Any readiness code test listed in the charts contained in this manual that does not pass indicates that there is a problem and will require further diagnosis.
- The status for each of the eight readiness codes, 0 or 1, indicates whether a particular emission system or function passed all the related diagnostic tests as listed in the chart.
- Be aware that multiple diagnostic tests (multiple chart steps) may need to run and pass for a particular monitor to complete and set to ready (0). Also note, certain tests may require previous step tests to have run successfully before the next test can run.
- The eight emission systems or functions are the same OBD-II readiness monitors viewed by a generic OBD-II scan tool.

Readiness codes can be useful for the following reasons:

- During an emission test, the readiness code can be used to confirm a system function and is now used by emission inspection programs to determine a pass or fail status.
- Related monitor repair work can be verified if the readiness code sets to an OK (Ready) status.

Viewing Readiness Codes

The following sections explain how to view readiness codes on gasoline or diesel engines with the Snap-on® scan tool.

Viewing Gas Engine Readiness Codes

You can view readiness codes on gasoline engines either through Functional Tests or through Expert Mode.

To view readiness codes through Functional Tests:

1. Identify the vehicle to the scan tool and connect the scan tool to the appropriate diagnostic connector as you would for normal scan tool diagnostics (described in the *Volkswagen/Audi Vehicle Communication Software Manual*).

The **SELECT SYSTEM** menu displays (Figure 1-1).

```
SELECT SYSTEM: (IF FITTED)
> 01-ENGINE MANAGEMENT
  02-AUTOMATIC TRANSMISSION
  12-CLUTCH ELECTRONICS
```

Figure 1-1. Sample **SELECT SYSTEM** menu

2. Select **01-ENGINE MANAGEMENT**.
3. Press **Y** repeatedly through the informational and warning screens until the **MAIN MENU** displays (Figure 1-2).

```
MAIN MENU          OTHER SYSTEMS
CODES              DATA
CUSTOM SETUP
>FUNCTIONAL TESTS
```

Figure 1-2. Sample **MAIN MENU**

4. From the **MAIN MENU**, select **FUNCTIONAL TESTS**.
The Functional Tests menu displays (Figure 1-3).

```
SCROLL TO SELECT A TEST:
BASIC SETTING
SERVICE INTERVAL RESET
>READINESS CODE
```

Figure 1-3. Sample **Functional Tests** menu

5. From the Functional Tests menu, select **READINESS CODE**.
The following screen displays (Figure 1-4).

```
REFER TO USER MANUAL FOR INSTRUCTIONS
HOW TO SET READINESS CODE.

PRESS Y TO CONTINUE, PRESS N TO RETURN.
```

Figure 1-4. Readiness code instructional screen

6. Press **Y**.
The Readiness Code menu displays (Figure 1-5).

```
SCROLL TO SELECT A FUNCTION:
05-CLEAR DTC MEMORY
08-READ MEASURING VALUE BLOCK
> 15-CHECK READINESS CODE SETTING
```

Figure 1-5. Sample **Readiness Code** menu

7. Select **15-CHECK READINESS CODE SETTING**.
Readiness codes display (Figure 1-6).

```
CHECK READINESS CODE SETTING

READINESS CODE:
00100110
```

Figure 1-6. Sample readiness code reading

To view readiness codes through Expert Mode:

1. Enter Expert Mode as described in the *Volkswagen/Audi Vehicle Communication Software Manual*.

The **SELECT SYSTEM** menu displays (Figure 1-7).

```
SELECT SYSTEM: (IF FITTED)
00-AUTOMATIC SYSTEM TEST
> 01-ENGINE MANAGEMENT MASTER
11-ENGINE MANAGEMENT SLAVE
```

Figure 1-7. Sample SELECT SYSTEM menu

2. Select **01-ENGINE MANAGEMENT MASTER**.

An instructional screen (Figure 1-8) displays, followed by a series of warning and informational screens.

```
COMMUNICATION WITH ECU NEEDS TO BE
STARTED. TURN KEY ON AND PRESS Y TO
START COMMUNICATION.
THIS WILL TAKE ABOUT 15 SECONDS.
```

Figure 1-8. Sample instructional screen

3. Follow the on-screen instructions and press **Y** repeatedly until the Expert Mode menu displays (Figure 1-9).

```
SCROLL TO SELECT FUNCTION:
> 01-READ ECU IDENTIFICATION
02-CHECK DTC MEMORY
03-ACTUATOR TESTS
```

Figure 1-9. Sample Expert Mode menu

4. Select **08-READ MEASURING VALUE BLOCK**.

The following screen displays (Figure 1-10).

```
SELECT MEASURING VALUE BLOCK: 0..
SCROLL TO CHANGE BLOCK NUMBER (000-255)
Y FOR NEXT, N FOR PREVIOUS POSITION/EXIT
```

Figure 1-10. Sample Measuring Value Block selection screen

5. Select Measuring Value Block **086**.
Readiness codes display (Figure 1-11).

```
CHECK READINESS CODE SETTING
READINESS CODE:
00100110
```

Figure 1-11. Sample readiness code reading

Viewing Diesel Engine Readiness Codes

For 1996 and newer 1Z and AHU diesel engines, you must use the generic OBD-II testing mode in the Snap-on® Domestic or Asian Imports Vehicle Communication Software to view readiness codes. For 1998–2003 ALH diesels, use the following procedure.

To view readiness codes on 1998–2003 ALH diesel engines:

1. With engine idling, select **EXPERT MODE > 01-ENGINE MANAGEMENT MASTER > 08-READ MEASURING VALUE BLOCK**.
2. Select Measuring Value Block **017**.
Channel 2 should read x000xxxx and Channel 4 should read 0xxxxxxx if readiness codes set (“x” digits are ignored).
3. If Channels 2 and 4 do not read as specified, perform the readiness setting road test on page 69 for 1998–2001 models, or on page 70 for 2002–03 models.
4. Press **N** to exit, then select **06-STOP COMMUNICATION** before exiting the Expert Mode menu.

Preparing to Set Readiness Codes

The following sections contain tips and example procedures that provide general information to get you acquainted with using the readiness code charts following this chapter. See “Appendix B: Frequently Asked Questions” on page 113 for more information.

Important Tips for Reading Readiness Charts

Note the following when using the readiness code charts contained in this book.

- Check for stored diagnostic trouble codes (DTCs). Any codes set will prevent readiness code completion. Repair all DTCs or other known malfunctions before attempting to set readiness codes.
- Make sure the correct engine ID code has been verified on the engine to ensure that the correct readiness chart and procedure is selected. All engine codes are stamped on the engine block or on the cylinder head with the first three letters being the designation (i.e., ABA, AAA). Some can be found on timing belt cover label on a sticker in the owner’s maintenance manual, or on a sticker in the spare tire compartment. There are often different engine codes for the same model and engine. See the *Volkswagen/Audi Vehicle Communication Software Manual* for engine ID code locations.
- *Do not* assume that the scan tool ID and engine code are correct if the scan tool communicates. The scan tool does not use the ID to establish communication—the units are automatically identified.
- Sometimes a readiness monitor will already be set when following the steps in a procedure. If Channel 4 reads “OK”, continue on to the next step.
- Some 2002–03 VW/Audi models use a different procedure (Audi AVK and AMB and VW AWM, BDF, and BDP) and the screen prompts are different. Once in the test, scrolling to the next display without exiting is not possible. Also, a readiness test will not automatically start after entering the display group, the **Y** button will need to be pressed to start test (changes the screen message from

“OFF” to “ON” in the Current State field. See “Sample Procedure 2: VW Engine ID Code AWM” on page 13 for more information).

Readiness Code Setting Requirements

Make sure to fulfil the following requirements before starting readiness code setting procedures:

- With the engine off and ignition off, remove the fuel tank filler cap to release pressure. This will help the Fuel Tank Leak Test run more quickly.
- Warm up the engine to normal operating temperature.



NOTE:

The VW ABA (1996–99 2.0L Golf, Jetta, GTI and Cabriolet) requires a cold engine to set the EVAP monitor. In this case, set this monitor first, then warm up the engine to set the others.

- Turn off all electrical accessories (A/C, rear window defroster, etc.).
- Make sure battery voltage is at least 12V and that the charging system is working properly.
- We recommend keeping the engine hood closed to maintain proper engine temperature. Both Audi and Volkswagen V8 engines may overheat if the hood is open while setting readiness codes.

Setting Readiness Codes: Sample Procedures

The sample procedures that follow illustrate how to use the charts in this manual.

Sample Procedure 1: VW Engine ID Code AWW

The following example procedure shows how to check readiness codes on a 2001 Volkswagen Jetta 1.8L, engine ID code AWW using Table 3-24, “Engine Code AWW: 2000–03 Jetta & Golf 1.8L,” on page 58.



NOTE:

This procedure can be used for all engine ID codes except Audi AVK and AMB, and VW AWM, BDF, and BDP. See “Sample Procedure 2: VW Engine ID Code AWM” on page 13 for a procedure that can be used with these engines.

To check readiness codes on a VW with engine ID code AWW:

1. Check DTC Memory.

From the readiness code menu, select **02-CHECK DTC MEMORY**. If no codes are present, the following screen displays (Figure 1-12) and you may go on to Step 3.

```
NO CODES PRESENT

Y/N TO EXIT
```

Figure 1-12. No Codes Present screen

If codes are present, a screen similar to Figure 1-13 displays and you must go on to the next step.

```
00523 INTAKE AIR TEMPERATURE SENSOR-G42
NO SIGNAL

Y/N TO EXIT, THUMB FOR PREV/NEXT CODE
```

Figure 1-13. Sample Check DTC Memory screen

2. Clear DTC Memory.

- a. Press **N** to return to the Readiness Code or Expert Mode menu.
- b. Select **05-CLEAR DTC MEMORY**.

The following screen displays (Figure 1-14).

```
TO CLEAR CODES, KEY MUST BE ON AND
ENGINE MUST BE OFF.

PRESS Y TO INITIATE CODE CLEARING.
```

Figure 1-14. Clear DTC Memory screen

- c. Press **Y** to clear codes.

When codes are cleared, the following screen displays (Figure 1-38).

```
NO CODES PRESENT

Y/N TO EXIT
```

Figure 1-15. No Codes Present screen



NOTE:

For reference, you may now select 15-CHECK READINESS CODE SETTING to view the following screen (Figure 1-16). Whenever codes are cleared, all readiness code monitors are reset to “Not Completed”, indicated by a “1”. Any zeros that did not change to ones indicate monitors not installed on this vehicle. Refer Table 1-1 on page 4 to see which monitors are not installed on the vehicle based on the readiness code digits in Figure 1-16.

```
CHECK READINESS CODE SETTING

READINESS CODE:      NOT COMPLETED
00101101
```

Figure 1-16. Check Readiness Code Setting screen after DTCs are cleared

3. Throttle Body Adaptation Test.

- Press **N** to return to the Readiness Code or Expert Mode menu.
- Select **04-BASIC SETTINGS**.

The following screen displays (Figure 1-17).

```

SELECT MEASURING VALUE BLOCK:    0..

SCROLL TO CHANGE BLOCK NUMBER (000-255)
Y FOR NEXT, N FOR PREVIOUS POSITION/EXIT
    
```

Figure 1-17. Select Measuring Value Block screen

- Select Measuring Value Block **060**.

A screen similar to Figure 1-18 displays.

```

BASIC SETTING VALUE BLOCK #060

CHANNEL 1 CHANNEL 2 CHANNEL 3 CHANNEL 4
18%      80%      2      RUNNING
    
```

Figure 1-18. Basic Setting Value Block #060

Notice that Current State “OFF” should change to “ON” when the test starts, indicated by Channel 4 reading “RUNNING”.

The adaptation takes only a few seconds. The other channels are reading the throttle valve angle sensors and will change as the throttle is actuated by the ECM. Do not touch the throttle pedal or turn off the key during the adaptation.

If the adaptation is successful, Channel 4 changes from “RUNNING” to “OK” (Figure 1-19).

```

BASIC SETTING VALUE BLOCK #060

CHANNEL 1 CHANNEL 2 CHANNEL 3 CHANNEL 4
15%      84%      0      OK
    
```

Figure 1-19. Basic Setting Value Block #060

If it is not successful, it will require further investigation. See the *Volkswagen/Audi Vehicle Communication User's Manual* for more information about the electronic throttle.

- Temperature Check.** Instead of Basic Settings, this is a non-intrusive reading of value block 08.

- Press **N** to return to the Readiness Code or Expert Mode menu.
- Select **08-READ MEASURING VALUE BLOCK**.

The following screen displays (Figure 1-20).

```

SELECT MEASURING VALUE BLOCK:    0..

SCROLL TO CHANGE BLOCK NUMBER (000-255)
Y FOR NEXT, N FOR PREVIOUS POSITION/EXIT
    
```

Figure 1-20. Select Measuring Value Block screen

- Select **004**.

A screen similar to Figure 1-21 displays.

```

READ MEASURING VALUE BLOCK #004

CHANNEL 1 CHANNEL 2 CHANNEL 3 CHANNEL 4
2040/min  13.440 V   93 °C   52 °C
    
```

Figure 1-21. Sample Read Measuring Value Block screen

- Check that the Channel 4 reading matches the specification in the chart, then press **N** to return to the Readiness Code or Expert Mode menu.

- Fuel Tank Leak Test.** This test checks the EVAP and fuel tank leak detection systems. The engine must be at idle for this test to run.

Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **071**.

The test starts (Figure 1-22).

BASIC SETTING VALUE BLOCK #071			
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4
OPEN	MEASUR.END	SYST.OK	

Figure 1-22. Basic Setting Value Block #071

Channel 3 reads “CHECK” or “MEASUR.END” as test is running.
Channel 4 changes to “SYST.OK” if this monitor runs successfully.

6. **Closed Loop Fuel Control Test.** This test monitors the ability of the engine management system to maintain fuel control to a desired air/fuel ratio.

Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **107**.

Channel 4 should change to “RUN” or “TEST RUN” when the test starts, providing the previous test was successful and engine conditions are correct (at idle and fully warmed up) (Figure 1-23).

BASIC SETTING VALUE BLOCK #107			
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4
680/min	-5.3%		RUN

Figure 1-23. Basic Setting Value Block #107

Channel 4 reads “SYST.OK” if the monitor runs successfully.

7. **EVAP System Diagnosis Test.**

Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **070**.

The test starts (Figure 1-24).

BASIC SETTING VALUE BLOCK #070			
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4
0.0%	7.6%		EVAP OK

Figure 1-24. Basic Setting Value Block #070

Channel 4 reads “EVAP OK” if the monitor runs successfully.

8. **After CAT Oxygen Sensor Test.** This test validates that the after CAT O2S is active.

Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **036**.

The test starts (Figure 1-25), providing the vehicle is at idle and the previous steps were successful.

BASIC SETTING VALUE BLOCK #036			
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4
0.760 V	B1-S1 OK		

Figure 1-25. Basic Setting Value Block #036

Channel 2 reads “B1-S2 OK” if the monitor runs successfully.

9. **Camshaft Timing Test.** This test makes sure that variable camshaft control is working properly. The engine speed must be 1800–2200 RPM for this test to run.

Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **094**.

The test starts when Channel 2 reads “ON” (Figure 1-26).

BASIC SETTING VALUE BLOCK #094			
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4
680/min	ON	SYST.OK	

Figure 1-26. Basic Setting Value Block #094

Channel 4 reads “SYST.OK” if the monitor runs successfully.

10. **Knock Sensor Test.** The engine speed must be 1800–2200 RPM for this test to run.

Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **028**.

The test starts (Figure 1-27).

BASIC SETTING VALUE BLOCK #028			
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4
760/min	17.2%	92 °C	SYST.OK

Figure 1-27. Basic Setting Value Block #028

Channel 4 changes to “SYST.OK” if this monitor runs successfully.

11. **After CAT Oxygen Sensor Aging Test.** This test validates that the after CAT O2S is active. The engine speed must be 1800–2200 RPM for this test to run.

Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **043**.

Channel 2 is CAT temperature, which usually must read at least 572°F (300°C) before the test will run.

The test starts when Channel 4 reads “TEST RUN”.

Channel 4 reads “B1-S2 OK” if the monitor runs successfully.

12. **Closed Loop Fuel Control Check.** This test validates that the system is achieving closed loop fuel control
 - a. Select **04-BASIC SETTING**.
 - b. Select **030**.

A screen similar to Figure 1-28 displays.

READ MEASURING VALUE BLOCK #030			
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4
011	110		

Figure 1-28. Basic Setting Value Block #030

Closed Loop is achieved if the last two digits in Channel 1 both read “1” (ignore any other channel information).

13. **Before CAT Oxygen Sensor Response Time Test.** The engine speed must be 1800–2200 RPM for this test to run.

Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **034**.

The test starts (Figure 1-29).

BASIC SETTING VALUE BLOCK #034			
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4
1960/min	490 °C	1.55	B1-S1 OK

Figure 1-29. Basic Setting Value Block #034

The channel specifications from Table 3-24 on page 58 must be met for this test to run. Channel 4 changes to “B1-S1 OK” if this monitor runs successfully.

14. **Oxygen Sensor CAT Control Dwell Time Test.** This test checks the relationship of the before CAT and after CAT O2S. The after CAT O2S control has the authority to override the before CAT O2S control. This allows the after CAT O2S control to take over, preventing possible CAT damage in case the before CAT O2S performance deteriorates to the point of jeopardizing the CAT. The after CAT O2S can also adjust to slight changes in the mixture if it detects displacement of the before CAT voltage curve. It takes control by holding the before CAT O2S control at its higher or lower point for a specific time (dwell time). If this time is in the positive range (e.g., 50 ms), then the mixture is shifted to the rich direction. If the time is negative (e.g., -50 ms), then the mixture is shifted to the lean direction. The engine speed must be at idle for this test to run.



NOTE:

If the value is above +200 ms, then there is a possible leaking exhaust system.

Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **037**.

The test starts (Figure 1-30).

BASIC SETTING VALUE BLOCK #037			
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4
24.8%	0.680 V	0.00	SYST.OK

Figure 1-30. Basic Setting Value Block #037

Channel 4 changes to “SYST.OK” if this monitor runs successfully.

15. **Catalytic Converter Test.** The engine speed must be 1800–2200 RPM for this test to run.

Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **046**.

The test starts (Figure 1-31).

BASIC SETTING VALUE BLOCK #046			
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4
2120/min	430 °C	0.12	TEST OFF

Figure 1-31. Basic Setting Value Block #046



NOTE:

Channel 3 specification: The ECM compares the voltage(s) of the before CAT O2S to the voltage(s) of the after CAT O2S. The result is the amplitude ratio between the two sensors and indicates the CAT test result in either percent or amplitude ratio. A good CAT amplitude ratio range is 0.00–0.32.

Channel 4 should change from “TEST OFF” to “TEST ON” or “TEST RUN” when test starts and change to “CAT B1 OK” if the monitor runs successfully.

16. **Secondary Air System Test.** The engine speed must be at idle for this test to run.



NOTE:

The Secondary Air Pump will turn on during this test.

Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **077**.

The test starts (Figure 1-32).

BASIC SETTING VALUE BLOCK #077			
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4
680/min	2.7 g/s	41.5%	SYST.OK

Figure 1-32. Basic Setting Value Block #077

Channel 4 changes to “SYST.OK” if this monitor runs successfully.

17. **Misfire Activity Check.** This check validates that misfire monitoring is active. The engine speed must be at idle for this test to run.
 - a. Press **N** to return to the Readiness Code or Expert Mode menu.
 - b. Select **08-READ MEASURING VALUE BLOCK**.
 - c. Select **014**.

The test starts (Figure 1-33).

BASIC SETTING VALUE BLOCK #014			
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4
680/min	20.0%	0	PREPARED

Figure 1-33. Basic Setting Value Block #014

Channel 4 reads “ACTIVATED” or “PREPARED” if this monitor runs successfully.

18. **Readiness Code Setting Check.**

Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **086**.

The Check Readiness Code Setting screen displays (Figure 1-34).

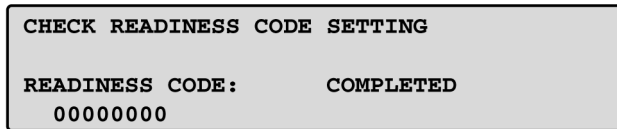


Figure 1-34. Check Readiness Code Setting screen

All readiness code monitors are set when all eight readiness code digits are “0”.



NOTE:

Compare this screen with Figure 1-16 on page 8 for a before and after comparison.

Sample Procedure 2: VW Engine ID Code AWM

The following procedure shows how to check readiness codes on a 2001–03 VW, engine ID code AWM using Table 3-19, “Engine Code AWM: 2001–03 Passat 1.8L 4-cylinder,” on page 52.



NOTE:

This procedure can only be used for engine ID codes Audi AVK and AMB, and VW AWM, BDF, and BDP. See “Sample Procedure 1: VW Engine ID Code AWW” on page 8 for a procedure that can be used with all other engine ID codes.

To check readiness codes on an VW with engine ID code AWM:

1. **Check DTC Memory.**

Select **02-CHECK DTC MEMORY**.

If no codes are present, the following screen displays (Figure 1-35) and you may go on to Step 3.



Figure 1-35. No Codes Present screen

If codes are present, a screen similar to Figure 1-36 displays and you must go on to the next step.

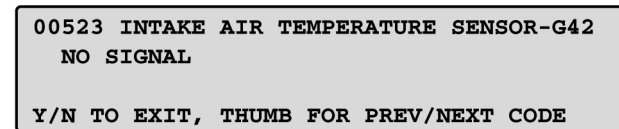


Figure 1-36. Sample Check DTC Memory screen

2. **Clear DTC Memory.**

- a. Press **Y** or **N** to exit the Check DTC Memory screen, then press **N** again to return to the Readiness Code or Expert Mode menu.
- b. Select **05-CLEAR DTC MEMORY**.

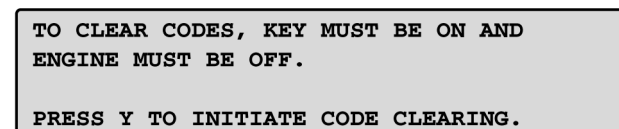


Figure 1-37. Clear DTC Memory screen

- c. Press **Y** to clear codes.

When codes are cleared, the following screen displays (Figure 1-38).

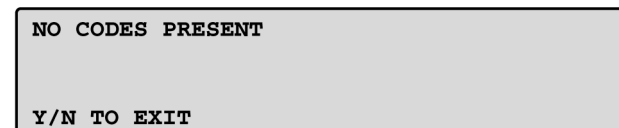


Figure 1-38. No Codes Present screen

- d. Press **N** to return to the Readiness Code or Expert Mode menu.



NOTE:

For reference, you may now select 15-CHECK READINESS CODE SETTING to view the following screen (Figure 1-39). Whenever codes are cleared, all readiness code monitors are reset to “Not Completed”, indicated here by a “1”. Any zeros that did not change to ones indicate monitors not installed on this vehicle. Refer Table 1-1 on page 4 to see which monitors are not installed on the vehicle based on the readiness code digits in Figure 1-39.

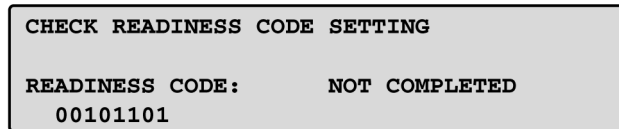


Figure 1-39. Check Readiness Code Setting screen after DTCs are cleared

3. **Throttle Body Adaptation Test.** This step is the adaptation procedure for the ECM to learn new settings for the Drive-by-Wire electronic throttle. Note that this test is done with the key on, engine off and it is recommended to perform this on a cold engine if possible.

- a. Select **04-BASIC SETTINGS**.

The following screen displays (Figure 1-40).

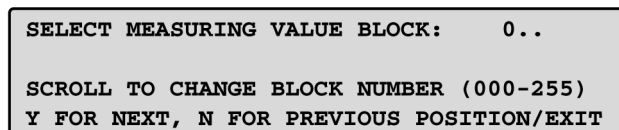


Figure 1-40. Select Measuring Value Block screen

You are now ready to start the adaptation test. Note that this adaptation procedure is part of the readiness chart because if the adaptation is not correct, it may set a DTC and or prevent a readiness code monitor from running.

- b. Select **060**.

A screen similar to Figure 1-41 displays.

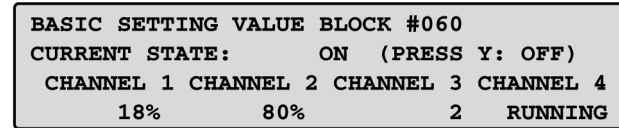


Figure 1-41. Basic Setting Value Block #060

Notice that Current State “OFF” should change to “ON” when the test starts to run, indicated by Channel 4 reading “RUNNING”.

The adaptation takes only a few seconds. The other channels are reading the throttle valve angle sensors and will change as the throttle is actuated by the ECM. Do not touch the throttle pedal or turn off the key during the adaptation.

If adaptation is successful, Channel 4 changes from “RUNNING” to “OK” (Figure 1-42).

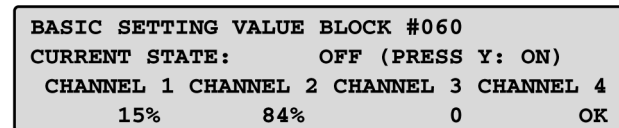


Figure 1-42. Basic Setting Value Block #060

If it is not successful, it will require further investigation. See “Chapter 4: Testing” in the *Volkswagen/Audi Vehicle Communication User’s Manual* for more information about the electronic throttle.

4. **Kickdown Adaptation Test.** This test adapts the throttle position for learning the transmission kickdown (passing gear).
- Press **N** to return to the Readiness Code or Expert Mode menu.
 - Select **04-BASIC SETTING**.
 - Select **063**.

Channel 4 will read “KICKDOWNACTIVATE” when the test is running (Figure 1-43).

```

BASIC SETTING VALUE BLOCK #063
CURRENT STATE:      ON (PRESS Y: OFF)
CHANNEL 1 CHANNEL 2 CHANNEL 3 CHANNEL 4
    14%         83% KICKDOWNACTIVATE
    
```

Figure 1-43. Basic Setting Value Block #063

- d. Press accelerator pedal all the way to the floor, past the point where you feel the switch for the kickdown.
The message in Channel 4 changes to “RUNNING” (Figure 1-44).

```

BASIC SETTING VALUE BLOCK #063
CURRENT STATE:      ON (PRESS Y: OFF)
CHANNEL 1 CHANNEL 2 CHANNEL 3 CHANNEL 4
    86%         86% KICKDOWN  RUNNING
    
```

Figure 1-44. Basic Setting Value Block #063

- e. Hold the pedal down to the floor for 3 seconds.
- f. When Channel 4 reads “OK” (Figure 1-45), let up on the pedal, the kickdown adaptation is successful.

```

BASIC SETTING VALUE BLOCK #063
CURRENT STATE:      OFF (PRESS Y: ON)
CHANNEL 1 CHANNEL 2 CHANNEL 3 CHANNEL 4
    14%         83%                                OK
    
```

Figure 1-45. Basic Setting Value Block #063

If Channel 4 reads “NOT OK”, further diagnosis is necessary.

5. **Measurement Block 001 Test.** This test validates that specific parameters are being met.
 - a. Press **N** to return to the Readiness Code or Expert Mode menu.

- b. Select **04-BASIC SETTING**.
- c. Select **001** (Figure 1-46).

```

BASIC SETTING VALUE BLOCK #001

CHANNEL 1 CHANNEL 2 CHANNEL 3 CHANNEL 4
2000/min      84 °C      1.00  11111111
    
```

Figure 1-46. Basic Setting Value Block #001

Channel 4 reads “11111111” if the monitor runs successfully.

6. **Closed Loop Fuel Control Test.** This test monitors the ability of the engine management system to maintain fuel control to a desired air/fuel ratio.

Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **107** (Figure 1-47).

```

BASIC SETTING VALUE BLOCK #107

CHANNEL 1 CHANNEL 2 CHANNEL 3 CHANNEL 4
680/min      -5.3%                        11111111
    
```

Figure 1-47. Basic Setting Value Block #107

Channel 4 reads “11111111” if the monitor runs successfully.

7. **EVAP System Diagnosis Test.**

Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **070**.

The test starts (Figure 1-48).

```

BASIC SETTING VALUE BLOCK #070

CHANNEL 1 CHANNEL 2 CHANNEL 3 CHANNEL 4
0.0%         7.6%                                OK
    
```

Figure 1-48. Basic Setting Value Block #070

Channel 4 reads “EVAP OK” if the monitor runs successfully.

8. **Knock Sensor Test.** The engine speed must be 1800–2200 RPM for this test to run.
Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **028**.
The test starts (Figure 1-49).

BASIC SETTING VALUE BLOCK #028				
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4	
760/min	17.2%	92 °C	SYST.OK	

Figure 1-49. Basic Setting Value Block #028

Channel 4 changes to “SYST.OK” if this monitor runs successfully.

9. **Before CAT Oxygen Sensor Response Time Test.** The engine speed must be 1800–2200 RPM for this test to run.
Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **034**.
The test starts (Figure 1-50).

BASIC SETTING VALUE BLOCK #034				
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4	
1960/min	490 °C	1.55	B1-S1 OK	

Figure 1-50. Basic Setting Value Block #034

The channel specifications from Table 3-24 on page 58 must be met for this test to run. Channel 4 changes to “B1-S1 OK” if this monitor runs successfully.

10. **Before CAT Oxygen Sensor Test.** This test validates that the before CAT O2S is active.
Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **036**.

The test starts (Figure 1-51), providing the vehicle is at idle and the previous steps were successful.

BASIC SETTING VALUE BLOCK #036				
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4	
0.760 V	B1-S1	OK		

Figure 1-51. Basic Setting Value Block #036

Channel 2 reads “B1-S2 OK” if the monitor runs successfully.

11. **Oxygen Sensor Test.** This test checks the relationship of the before CAT and after CAT O2S. The after CAT O2S control has the authority to override the before CAT O2S control. This allows the after CAT O2S control to take over, preventing possible CAT damage in case the before CAT O2S performance deteriorates to the point of jeopardizing the CAT. The after CAT O2S can also adjust to slight changes in the mixture if it detects displacement of the before CAT voltage curve. It takes control by holding the before CAT O2S control at its higher or lower point for a specific time (dwell time). If this time is in the positive range (e.g., 50 ms), then the mixture is shifted to the rich direction. If the time is negative (e.g., -50 ms), then the mixture is shifted to the lean direction. The engine speed must be at idle for this test to run.



NOTE:

If the value is above +200 ms, then there is a possible leaking exhaust system.

Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **037**.

The test starts (Figure 1-52).

BASIC SETTING VALUE BLOCK #037			
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4
24.8%	0.680 V	0.00	SYST.OK

Figure 1-52. Basic Setting Value Block #037

Channel 4 changes to “SYST.OK” if this monitor runs successfully.

12. **Before CAT Oxygen Sensor Aging Test.** This is a test of adequate response time for the before CAT O2S. This test is performed with the engine running (do not shut engine off unless the instructions specifically state that a test is performed with the engine off).
 - a. Press **N** to return to the Readiness Code or Expert Mode menu.
 - b. Select **04-BASIC SETTING**.
 - c. Select **043**.

A screen similar to Figure 1-53 displays.

BASIC SETTING VALUE BLOCK #043			
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4
760/min	465 °C	1.79	TEST OFF

Figure 1-53. Basic Setting Value Block #043

- d. Press **Y** to change state to “ON”.
Channel 4 changes to read “TEST ON” (Figure 1-54).

BASIC SETTING VALUE BLOCK #043			
CURRENT STATE: ON (PRESS Y: OFF)			
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4
2120/min	590 °C	1.79	TEST ON

Figure 1-54. Basic Setting Value Block #043

- e. Press the brake and throttle pedals to the floor.

Engine RPM will automatically go to 2200 RPM. If the O2S response time is OK, Channel 4 will read “B1-S1 OK” within a short time, usually 30 seconds to 1 minute (Figure 1-55).

BASIC SETTING VALUE BLOCK #043			
CURRENT STATE: ON (PRESS Y: OFF)			
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4
760/min	610 °C	1.95	B1-S1 OK

Figure 1-55. Basic Setting Value Block #043



NOTE:

The value in Channel 2 is calculated CAT temperature and the value in Channel 3 is a calculated value for O2S response time (higher the number, the better the response time).

13. **Catalytic Converter Test.** This test checks the fuel tank ventilation valve for operation and leakage.
 - a. Press **N** to return to the Readiness Code or Expert Mode menu.
 - b. Select **04-BASIC SETTING**.
 - c. Select **046**.
 - d. Press **Y** to change state to “ON” (Figure 1-56).

BASIC SETTING VALUE BLOCK #046			
CURRENT STATE: ON (PRESS Y: OFF)			
CHANNEL 1	CHANNEL 2	CHANNEL 3	CHANNEL 4
0.02	TEST ON	0.03	TEST ON

Figure 1-56. Basic Setting Value Block #046

- e. Press the brake and throttle pedals to the floor.
The test begins when Channel 4 changes to read “TEST ON”.
Channel 4 will read “CATB2 OK” if this monitor runs successfully (Figure 1-57).

```

BASIC SETTING VALUE BLOCK #046
CURRENT STATE:      ON (PRESS Y: OFF)
CHANNEL 1 CHANNEL 2 CHANNEL 3 CHANNEL 4
0.00 CATB1 OK      0.00 CATB2 OK
    
```

Figure 1-57. Basic Setting Value Block #046

If the test finishes with “NOT OK”, then further diagnosis of the catalytic converter is necessary.



NOTE:

Snap the throttle swiftly to 4000 RPM at the end of the test to be able to continue to the next test.

14. **Camshaft Timing Test.** This test makes sure that variable camshaft control is working properly. The engine speed must be 1800–2200 RPM for this test to run.

Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **094**.

The test starts when Channel 2 reads “ON” (Figure 1-58).

```

BASIC SETTING VALUE BLOCK #094
CHANNEL 1 CHANNEL 2 CHANNEL 3 CHANNEL 4
680/min      ON    SYST.OK
    
```

Figure 1-58. Basic Setting Value Block #094

Channel 4 reads “SYST.OK” if the monitor runs successfully.

15. **Fuel Tank Leak Test.** This test checks the EVAP and fuel tank leak detection systems. The engine must be at idle for this test to run.

Without pressing **N** to return to the Readiness Code or Expert Mode menu, select value block **071**.

The test starts (Figure 1-59).

```

BASIC SETTING VALUE BLOCK #071
CHANNEL 1 CHANNEL 2 CHANNEL 3 CHANNEL 4
OPEN      MEASUR.END  SYST.OK
    
```

Figure 1-59. Basic Setting Value Block #071

Channel 3 reads “CHECK” or “MEASUR.END” as test is running. Channel 4 changes to “SYST.OK” if this monitor runs successfully.

16. **Secondary Air System Test.** This test checks the secondary air injection system.
 - a. Press **N** to return to the Readiness Code or Expert Mode menu.
 - b. Select **04-BASIC SETTING**.
 - c. Select **077**.

A screen similar to Figure 1-60 displays.

```

BASIC SETTING VALUE BLOCK #077
CURRENT STATE:      OFF (PRESS Y: ON)
CHANNEL 1 CHANNEL 2 CHANNEL 3 CHANNEL 4
760/min      0.0%    0.0%    TEST OFF
    
```

Figure 1-60. Basic Setting Value Block #077

- d. Press **Y** to change state to “ON”.
- e. Snap the throttle twice to at least 4000 RPM to start the test. The test starts when Channel 4 changes to read “TEST ON” (Figure 1-61).

```

BASIC SETTING VALUE BLOCK #077
CURRENT STATE:      ON (PRESS Y: OFF)
CHANNEL 1 CHANNEL 2 CHANNEL 3 CHANNEL 4
760/min      0.0%    0.0%    TEST ON
    
```

Figure 1-61. Basic Setting Value Block #077

Channel 4 will read “SYST.OK” if this monitor runs successfully (Figure 1-62).

```

BASIC SETTING VALUE BLOCK #077
CURRENT STATE:      ON (PRESS Y: OFF)
CHANNEL 1 CHANNEL 2 CHANNEL 3 CHANNEL 4
760/min      5.3%      23.0%  SYST.OK
    
```

Figure 1-62. Basic Setting Value Block #077

If test finishes with “NOT OK”, then further diagnosis of the air injection system is needed.



NOTE:

Should hear the secondary air pump run for several seconds during the test

17. **Misfire Activity Check.** This test is non-intrusive (performed in 08 not 04) and validates that misfire monitoring is active or “ON”. The engine speed must be at idle for this test to run.
 - a. Press **N** to return to the Readiness Code or Expert Mode menu.
 - b. Select **08-READ MEASURING VALUE BLOCK**.
 - c. Select **014**.

A screen similar to Figure 1-63 displays.

```

BASIC SETTING VALUE BLOCK #014
CHANNEL 1 CHANNEL 2 CHANNEL 3 CHANNEL 4
680/min      20.0%      0  PREPARED
    
```

Figure 1-63. Basic Setting Value Block #014

Channel 4 reads “ACTIVATED” or “PREPARED” if this monitor runs successfully.

18. **Oxygen Sensor Heater Test.** This tests the before and after CAT O2S heaters as well as the heater control circuitry. This test turns the heaters on, and then monitors the heater resistance, which must be less than 0.02 kohm, as specified for Channel 3 in the chart.
 - a. Press **N** to return to the Readiness Code or Expert Mode menu.

- b. Select **04-BASIC SETTING**.
- c. Select **041**.

A screen similar to Figure 1-64 displays.

```

BASIC SETTING VALUE BLOCK #041
CHANNEL 1 CHANNEL 2 CHANNEL 3 CHANNEL 4
2000/min      ON      0.02      ON
    
```

Figure 1-64. Basic Setting Value Block #041

If the Channel 3 reading falls within the specification, move on to the next test. If not, the oxygen sensor heater or circuit must be checked.

19. **Readiness Code Setting Check.**
 - a. Press **N** to return to the Readiness Code or Expert Mode menu.
 - b. Select **08-READ MEASURING VALUE BLOCK**.
 - c. Select **086**.

A screen similar to Figure 1-65 displays.

```

CHECK READINESS CODE SETTING
READINESS CODE:      COMPLETED
00000000
    
```

Figure 1-65. Check Readiness Code Setting screen

If all eight readiness code digits are “0”, then all readiness code monitors are set.

Chapter 2: Generic Road Tests

This chapter contains generic road tests for Volkswagen and Audi that can be used to set readiness codes. The roads tests that follow are expansions of the OBD-II Drive Cycle described on page 1, but are manufacturer-specific.

These generic road tests may be used in the following manner:

- As an alternative procedure to setting problem readiness monitors.
- For specific 2003 models that currently have no readiness chart.
- In combination with the charts. After repairs, a road test performed according to the following procedures could be done first. The chart can then be used to set any remaining un-set monitors.



NOTE:

Be aware that these road tests are time-consuming. Always use the charts first, if available. In a rare instance where a monitor test will not run using the scan tool and charts, the road test procedure will help.

At the time of this printing, there were no charts available for some 2002–03 engines.

Volkswagen Generic Road Test

Make sure that the following test requirements are met before starting the Volkswagen generic road test:

- The respective fuses of the Motronic fuel injection and ignition system must be OK.
- Battery voltage must be at least 12V.
- All electrical accessories (lights, rear window defroster, etc.) must be switched off.

- A/C must be switched off.
- Ground connections to the engine and the chassis must be OK.
- There must not be any diagnostic trouble codes (DTCs) stored in ECM memory.



NOTE:

Make sure to accelerate the vehicle uniformly, not at WOT.

To perform the Volkswagen generic road test:

1. Drive the vehicle until engine operating temperature (EOT) is at least 176°F (80°C).
2. Turn the engine off and let the vehicle cool until EOT is at least 41 to 95°F (5 to 35°C).
3. Drive the vehicle for 10 minutes in the highest gear or in the highest driving mode on a level surface at a constant speed in the range of 40 to 50 MPH (65 to 80 KPH) at an engine speed of 2000 to 2500 RPM.
4. After 10 minutes, downshift to an engine speed of 2800 to 3500 RPM.
5. Drive in deceleration mode at an engine speed of about 1800 RPM.
6. Park the vehicle and let the engine run at idle for 3 minutes.
The gas pedal *must not* be operated during this time.
7. Drive the vehicle for 10 minutes in the highest gear or in the highest driving mode on a level surface at a constant speed in the range of 40 to 50 MPH (65 to 80 KPH) at an engine speed of 2000 to 2500 RPM.
8. Park the vehicle and let the engine run at idle for 3 minutes.
The gas pedal *must not* be operated during this time.
9. Read readiness codes (see “Viewing Readiness Codes” on page 5 for a detailed procedure).

10. If all digits in the 8-digit number block read 0, then you are finished. If one of the digits is a 1, continue to the next step.
11. Drive the vehicle for 10 minutes in the highest gear or in the highest driving mode on a level surface at a constant speed in the range of 40 to 50 MPH (65 to 80 KPH) at an engine speed of 2000 to 2500 RPM.
12. Park the vehicle and let the engine run at idle for 3 minutes. The gas pedal *must not* be operated during this time.
13. Read readiness codes again.
14. If either the Secondary Air Injection system (position #5) or the EVAP canister system (position #6) read 1 instead of 0, repeat the complete procedure from the beginning.

To perform the Audi generic road test:

1. If the engine is warm, let the vehicle cool until EOT is 50 to 122°F (10 to 50°C).
2. Start the engine and let it run at idle for at least 15 minutes.
3. Drive the vehicle for 15 minutes in the highest gear or in the highest driving mode on a level surface at a constant speed of about 56 MPH (90 KPH) at an engine speed of 1800 to 2200 RPM.
4. Read readiness codes (see “Viewing Readiness Codes” on page 5 for a detailed procedure).

Audi Generic Road Test

Make sure that the following test requirements are met before starting the Audi generic road test:

- The respective fuses of the Motronic fuel injection and ignition system must be OK.
- Battery voltage must be at least 12V.
- All electrical accessories (lights, rear window defroster, etc.) must be switched off.
- A/C must be switched off.
- Ground connections to the engine and the chassis must be OK.
- There must not be any diagnostic trouble codes (DTCs) stored in ECM memory.
- Throttle valve angle should be 10 to 20%.

Chapter 3: Volkswagen Readiness Code Charts

The following charts contain readiness code information for Volkswagen vehicles.

Gas Engines

Table 3-1. Engine Code AAA: 1996–2000 Golf, Jetta, GTI & Passat 2.8L (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/098				ADP I.O or ADP OK
4.	START ENGINE COLD					
5. EVAP System Diagnosis Test	COOL ENGINE IDLE	04/153	41 to 194°F (5 to 90°C)	41 to 113°F (5 to 45°C)		xxxxx100
6.	WARM UP AT 2500 RPM	08/103		More than 104°F (40°C)		xxxxxxx0
7. Secondary Air System Test (if installed)	IDLE	04/160	More than 104°F (40°C)			xx11x100
8. Warm-up	2200–3300 RPM until temperatures are attained	08/103		More than 140°F (60°C)	More than 680°F (360°C)	xxxxxxx0
9. Oxygen Sensor Aging Test	IDLE after 5 seconds	04/131 Do Not Exit				xxxx100
10. Fuel Trim Part Throttle Adaptation Test	ROAD TEST (avoid overrun): 1) Momentarily full throttle from 4600 RPM. 2) ½ throttle acceleration from 30 MPH.	04/125 Do Not Exit				x1x1xxx0
11. Fuel Trim Idle Adaptation Test	IDLE 30 seconds	04/125 Do Not Exit				xxxxx100

Table 3-1. Engine Code AAA: 1996–2000 Golf, Jetta, GTI & Passat 2.8L (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
12. Oxygen Sensor Aging Test	• Vehicle stationary • All accessories off • 2200–2800 RPM for 20 seconds	04/130 Do Not Exit		0 to 2.8 seconds	4, 6, or 10	xxxxx100
13. Catalytic Converter Test	2700–3300 RPM for 120 seconds	04/136 Do Not Exit		Min. 680°F (360°C)	Less than 0.3	xxxxx100
14. EVAP System Diagnosis Test	• Vehicle stationary • Do not load engine • Idle for 30 seconds	04/150				xxxxx100
15. Readiness Code Setting Check		Exit, Select 15	00000000			
NOTE: If Channel 1 reads 00000000, then the vehicle has passed and you are finished. If it does NOT read 00000000, then proceed with the following steps.						
16. Knock Sensor Test	2500 RPM, check in 15 seconds	04/145				
17. Before CAT Oxygen Sensor Heater Test	2200–2800 RPM	04/115				
18. After CAT Oxygen Sensor Heater Test	2200–2800 RPM	04/116				
19. Before CAT Oxygen Sensor Heater Test	2200–2800 RPM	04/120				
20. Oxygen Sensor Heater Test	2200–2800 RPM	04/121				
21. Throttle Body Adaptation Test	IDLE	04/140, 141, 142				

Chapter 3: Volkswagen Readiness Code Charts—Engine Code ABA: 1996–99 Golf, Jetta, GTI & Cabriolet 2.0L

Table 3-2. Engine Code ABA: 1996–99 Golf, Jetta, GTI & Cabriolet 2.0L (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/098				ADP I.O or ADP OK
4.	START ENGINE COLD					
5. Fuel Tank Leak Test	COOL ENGINE IDLE	04/153	41 to 194°F (5 to 90°C)	41 to 113°F (5 to 45°C)		xxxxx100
6.	WARM UP TO 2500 RPM	08/103		More than 104°F (40°C)		xxxxxxx0
7. Secondary Air System Test (if installed)	IDLE	04/160	More than 104°F (40°C)			xx11x100
8. Warm-up	2200–3300 RPM until temperatures are attained	08/103		More than 140°F (60°C)	More than 680°F (360°C)	xxxxxxx0
9. Oxygen Sensor Aging Test	IDLE after 5 seconds	04/131 Do Not Exit				xxxx100
10. Fuel Trim Part Throttle Adaptation Test	ROAD TEST (avoid overrun): 1) Momentarily full throttle from 4600 RPM. 2) ½ throttle acceleration from 30 MPH in 2nd gear, 2500–3500 RPM, no deceleration.	04/125 Do Not Exit				x1x1xxx0
11. Fuel Trim Idle Adaptation Test	IDLE 30 seconds	04/125 Do Not Exit				xxxxx100
12. Oxygen Sensor Aging	• Vehicle stationary • 2200–2800 RPM for 20 seconds	04/130 Do Not Exit		0 to 2.8 seconds	4, 6, or 10	xxxxx100
13. Catalytic Converter Test	2700–3300 for 120 seconds	04/136 Do Not Exit		Min. 680°F (360°C)	Less than 0.3	xxxxx100
14. EVAP System Diagnosis Test	• Vehicle stationary • Do not load engine • Idle for 30 seconds	04/150				xxxxx100

Chapter 3: Volkswagen Readiness Code Charts—Engine Code ABA: 1996–99 Golf, Jetta, GTI & Cabriolet 2.0L

Table 3-2. Engine Code ABA: 1996–99 Golf, Jetta, GTI & Cabriolet 2.0L (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
15. Readiness Code Setting Check		Exit, Select 15	00000000			
NOTE: If Channel 1 reads 00000000, then the vehicle has passed and you are finished. If it does NOT read 00000000, then proceed with the following steps.						
16. Knock Sensor Test	2500 RPM, check in 15 seconds	04/145				
17. Before CAT Oxygen Sensor Heater Test	2200–2800 RPM	04/115				
18. After CAT Oxygen Sensor Heater Test	2200–2800 RPM	04/116				
19. Before CAT Oxygen Sensor Heater Test	2200–2800 RPM	04/120				
20. Oxygen Sensor Heater Test	2200–2800 RPM	04/121				
21. Throttle Body Adaptation Test (if applicable)	IDLE NOTE: This test has no exact specifications. The diagnostic test runs in the background during the check.	04/140				
22. Throttle Valve Actuator Test	IDLE NOTE: This test has no exact specifications. The diagnostic test runs in the background during the check.	04/141, 142				

Chapter 3: Volkswagen Readiness Code Charts—Engine Code ABA: 2000–01 Cabriolet 2.0L

Table 3-3. Engine Code ABA: 2000–01 Cabriolet 2.0L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	IDLE	04/060			Idling speed	ADP.OK
4. Temperature Check	IDLE	08/004			41 to 194°F (5 to 90°C)	Max. 140°F (60°C)
5. Fuel Tank Leak Test	Idle for 30 seconds and check specifications	04/071				SYST.OK
6. EVAP System Diagnosis Test	IDLE	04/070				TVV OK
7. Secondary Air System Test	IDLE	04/077				SYST.OK
8. Oxygen Sensor Aging Test	A. 2200–2800 RPM	08/034		More than 666°F (352°C)		
	B. 2200–2800 RPM	08/030 Do Not Exit		111		
	C. 2200–2800 RPM	04/034				B1 P1 OK
9. Catalytic Converter Test	2800–3200 RPM	04/046		More than 666°F (352°C)	Less than 0.55	CAT B1 OK

Table 3-4. Engine Code AEB: 1998–99 Passat 1.8L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Readiness Code Setting Check	Key On, Engine Off	08/086	11100101/ 01100101	11111101	00011111	00000000
4. Throttle Body Adaptation Test	Key On, Engine Off	04/060	0 to 25°	0 to 25°	IDLE	ADP.OK
5. Before and After CAT Oxygen Sensor Heater Check	1800–2200 RPM	08/030	111	111		
6. Before CAT Oxygen Sensor Response Time Test	1800–2200 RPM	04/034	1800 to 2200 RPM	0.8 to 2.0 ms	0.0 to 3.3 s	B1-S1 OK
7. Catalytic Converter Test	1800–2200 RPM	04/046	0.0 to 1.0	0 to 2	58.6 s	CAT B1 OK NOTE: May take up to 1 min. before test runs (Test ON).
8. EVAP System Diagnosis Test	IDLE	04/070		-5.4 to +9.4%		
9. Fuel Tank Leak Test	IDLE	04/071				
10. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Chapter 3: Volkswagen Readiness Code Charts—Engine Code AEB: 2000 Passat 1.8L

Table 3-5. Engine Code AEB: 2000 Passat 1.8L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	8 to 60%	60 to 94%	0 to 9	ADP.OK
4. Kickdown Adaptation Test	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	12 to 97%	4 to 94%	KICKDOWN	ADP.OK
5. Closed Loop Fuel Control Test	IDLE	04/107	800 to 900 RPM	-8% to +8%		SYST.OK
6. Fuel Tank Leak Test	IDLE	04/071			Check END	
7. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%			EVAP OK
8. Oxygen Sensor Heater Test	1800–2200 RPM	04/041	0 to 2.0 kohm	Htg..bC ON	0 to 2.0 kohm	Htg..bC ON
9. After CAT Oxygen Sensor Test	IDLE	04/036	0.5 to 0.095V	B1-S2 OK		
10. Oxygen Sensor Response Time Test	1800–2200 RPM	04/034	1800–2200 RPM	More than 662°F (350°C)	0 to 1.0 s	B1-S1 OK
11. Oxygen Sensor Test	IDLE	04/037	12 to 30%	0.1 to 0.9V	-150 ms to +150 ms	SYST.OK
12. After CAT Oxygen Sensor Aging Test	1800–2200 RPM	04/043	1800–2200 RPM	More than 662°F (350°C)	0.1 to 0.9V	B1-S2 OK
13. Catalytic Converter Test	1800–2200 RPM	04/046	1800–2200 RPM	More than 752°F (400°C)	0.0 to 0.29	CATB1 OK
14. Secondary Air System Test	IDLE	04/077	740–920 RPM	2 to 5 g/s	4 to 10 g/s	SYST.OK
15. Readiness Code Setting Check	IDLE	08/086	00000000			

Table 3-6. Engine Code AEG: 1998–2001 Golf, GTI, Jetta & New Beetle 2.0L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/098			IDLE	ADP.OK
4. Secondary Air System Test	IDLE	04/077	Engine Temp 43 to 156°F (6 to 69°C)			SYST.OK
5. EVAP System Diagnosis Test	IDLE	04/070				EVAP OK
6. Fuel Tank Leak Test	IDLE	04/071		ABORT	CHECK END	SYST.OK
7. After CAT Oxygen Sensor Aging Test	2200–2800 RPM	04/034	2200–2800 RPM	More than 666°F (352°C)	Max. 2.20 s	B1-S1 OK
8. Catalytic Converter Test	2800–3200 RPM	04/046	2800–3200 RPM	More than 666°F (352°C)	Max. 0.55	CAT B1 OK
9. Readiness Code Setting Check	IDLE	Exit, Select 15	00000000			

Chapter 3: Volkswagen Readiness Code Charts—Engine Code AES: 1997 Eurovan 2.8L VR6

Table 3-7. Engine Code AES: 1997 Eurovan 2.8L VR6 (sheet 1 of 4)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Closed Loop Fuel Control Check	- Engine at normal operating temp. - Run engine at 3000–3500 RPM. - Check specs after 60 seconds.	08/103	1.4 to 2.4 ms (Engine Load Range)	More than 104°F (40°C) ECT	More than 680°F (360°C) (Exh. temp.)	xx1xxx00
4. Secondary Air System Test	IDLE Check after 20 seconds.	04/160 Do Not Exit	More than 140°F (60°C) ECT	0.7% (O2 Control w/Secondary Air Valve Open)	25% (O2 Control w/ Secondary Air Injection On)	xx11x100
5. Closed Loop Fuel Control Test	2200–3300 RPM Check specs after 120 seconds	04/103 Do Not Exit	1.4 to 2.4 ms (Engine Load Range)	More than 140°F (60°C) ECT	More than 680°F (360°C) (Exh. temp.)	xx1xxx00
6. After CAT Oxygen Sensor Aging Test	IDLE 30 seconds	04/131 Do Not Exit	650–750 RPM	0 to 1V (O2V after CAT)	-1200 to +1200 ms (Sensor Aging time value)	xx11xx00
7. Fuel Trim Part Throttle Adaptation Test	ROAD TEST: Drive in 2nd gear (manual & auto) 2500–4000 RPM. Check specs during road test. Continue road testing until specs are obtained. Avoid extended deceleration periods which may prevent diagnostic from running.	04/125 Do Not Exit	2500–3500 RPM	-10 to +10% (O2 adaptation under partial load)	-12 to +12.4% (O2 adaptation at idle)	01x1x100
8. EGR Test	ROAD TEST: Drive in 2nd gear (manual & auto) 2000–3500 RPM for a minimum of 20 seconds. Check specs during road test.	04/155 Do Not Exit	2000–3500 RPM	More than 122°F (50°C) (EGR Temp. at idle)	Approx. 122°F (50°C) (Temp. difference between idle & partial load)	1111x100

Table 3-7. Engine Code AES: 1997 Eurovan 2.8L VR6 (sheet 2 of 4)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
9. Fuel Trim Idle Adaptation Test	- Engine coolant more than 140°F (60°C) (08/001). - Intake manifold temp. more than 176°F (80°C) (08/003). - Run engine at idle & check specs after 30 seconds.	04/125 Do Not Exit	650–750 RPM	-23 to +23% (O2 adaptation under partial load)	-12 to +12.4% (O2 adaptation at idle)	01x1x100
10. Before CAT Oxygen Sensor Aging Test	2500–3500 RPM for 20 seconds, then check specs.	04/130 Do Not Exit	2500–3500 RPM	0 to 2 seconds (Period duration of O2 control before CAT)	10 (O2S periods recognized)	111x100
11. Catalytic Converter Test	2500–3500 RPM for 20 seconds, then check specs.	04/136 Do Not Exit	2500–3500 RPM	More than 680°F (360°C)	0.15 max. (Idle speed control deviations during test)	1111x100
12. Fuel Tank Leak Test	- Coolant fan not on. - Idle 30 seconds, then check specs. (Do not load engine or it will abort test.)	04/150 Do Not Exit	0 to 100% (Fuel tank vent valve minimum opening)	-7 to -23 or 7 to 23 (O2 control deviations during test)	0.39 g/s max. (Idle speed control deviations during test)	1110x100
13. Readiness Code Setting Check	If all Readiness Codes are not set (all zeros), continue with Step 13.	15				
14. Vehicle Speed Sensor Test	ROAD TEST: Drive in 2nd or 3rd gear (manual & auto) 3500 RPM for 5 seconds, then release accelerator for 3 seconds (driving speed must still be at 12 MPH minimum and have been decelerating for 2 seconds minimum).	04/180 Do Not Exit	5 to 10 seconds 3500 RPM min.	More than 176°F (80°C)	16 to 31 MPH (25 to 50 KPH)	x111x100

Chapter 3: Volkswagen Readiness Code Charts—Engine Code AES: 1997 Eurovan 2.8L VR6

Table 3-7. Engine Code AES: 1997 Eurovan 2.8L VR6 (sheet 3 of 4)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
15. Knock Sensor Test, Bank 1	3200 RPM minimum. Check specs after 15 seconds.	04/145 Do Not Exit	3200 RPM min.	7 max. (Amplification factor for knock sensor signal)	0 (Open circuit in wiring counter)	xxxx1100
16. Knock Sensor Test, Bank 2	3200 RPM minimum. Check specs after 15 seconds.	04/146 Do Not Exit	3200 RPM min.	7 max. (Amplification factor for knock sensor signal)	0 (Open circuit in wiring counter)	xxxx1100
17. Before CAT Oxygen Sensor Test	2200–2800 RPM	04/115 Do Not Exit	More than 140°F (60°C) (Engine Coolant Temp.)	Approx. 680°F 360°C (Exh. Gas Temp.)	0 to 1V (O2S before CAT voltage fluctuating)	1011x100
18. After CAT Oxygen Sensor Test	2200–2800 RPM for 15 seconds, then check specs.	04/116 Do Not Exit	0 to 1200 ms (O2 after CAT switching time delay)	680°F (360°C) (Exh. Gas Temp.)	More than 0.6V (O2S V after CAT)	1011x100
19. Before CAT Oxygen Sensor Heater Test	2200–2800 RPM	04/120 Do Not Exit	More than 680°F (360°C) (Exh. Gas Temp.)	120 seconds (Time between O2S heating & start of test)	4.5 to 15.6 ohm (O2S before CAT Heater resistance)	1111x100
20. After CAT Oxygen Sensor Heater Test	2200–2800 RPM	04/121 Do Not Exit	More than 680°F (360°C) (Exh. Gas Temp.)	120 seconds (Time between O2S heating & start of test)	4.5 to 15.6 ohm (O2S before CAT Heater resistance)	
21. Idle Air Valve Test	IDLE: NOTE: This test has no exact specs. The diagnostic test runs in the background during the check.	04/140				

Table 3-7. Engine Code AES: 1997 Eurovan 2.8L VR6 (sheet 4 of 4)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
22. Throttle Valve Actuator Test	IDLE: NOTE: This test has no exact specs. The diagnostic test runs in the background during the check.	04/141,142				
23. Readiness Code Setting Check		Exit, Select 15	00000000			

Chapter 3: Volkswagen Readiness Code Charts—Engine Code AES: 1998–99 Eurovan 2.8L VR6

Table 3-8. Engine Code AES: 1998–99 Eurovan 2.8L VR6 (sheet 1 of 3)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
Test Requirements (in addition to those listed in “Readiness Code Setting Requirements” on page 7): • Intake air temperature less than 194°F (90°C). • Coolant temperature less than 203°F (95°C). • Throttle valve angle less than 50°F (10°C).						
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/098	4.000 to 5.000V	3.000 to 4.000V	IDLE Operating Mode	ADP OK
4. Throttle Position Specification Check	Key On, Engine Off— Check throttle position switch spec. Slowly go to WOT and watch angle display.	08/003	0 RPM		Less than 80 to 87°	Approx. Ambient Temp.
5. Throttle Position Specification Check	IDLE	08/003	650–750 RPM		Less than 0 to 5°	Approx. Ambient Temp.
6. EVAP System Diagnosis Test	IDLE	04/153 Do Not Exit	140 to 203°F (60 to 95°C)	41 to 201°F (5 to 94°C)	10.1 or 19.1 s	11110100 or 11111000
7. Closed Loop Fuel Control Test	ROAD TEST: Drive in 2nd gear between 2500 and 4000 RPM. Continue test drive until Channel 4 reads as indicated.	04/103		Min. 140°F (60°C)	Approx. 680°F (360°C)	xx1xxxx0
8. Fuel Trim Part Throttle Adaptation Test	ROAD TEST: Drive in 3rd gear (manual & auto) 2400–2600 RPM for a minimum of 22 seconds until Channel 4 reads as indicated.	04/125 Do Not Exit	2400–2600 RPM	-10 to +10% (O2S Adaptation at Part Load)	-12.4 to +12.4% (O2S Adaptation at Idle)	x111xx00
NOTE: For most of these monitors, the 4th channel does not read ADP OK. Instead, if monitors have run OK, 0 & 1 digits will match exactly as in chart.						

Table 3-8. Engine Code AES: 1998–99 Eurovan 2.8L VR6 (sheet 2 of 3)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
9. Vehicle Speed Sensor Test	ROAD TEST: 1) Drive in 2nd or 3rd gear (manual & auto) keeping above 3500 RPM for a minimum of 5 seconds. 2) Release accelerator pedal for 3 seconds (after 3 seconds, the driving speed must still be at least 10 MPH in engine deceleration for a minimum of 2 seconds until Channel 4 reads as indicated.	04/180	At least 3500 RPM for 5 to 10 seconds	At least 176°F (80°C) (Coolant Temp.)	20 to 50 KPH (Vehicle Speed)	x111x100
10. Fuel Trim Part Throttle Adaptation Test	End Road Test. IDLE	04/125 Do Not Exit	650–750 RPM	-10 to +10% (O2S Adaptation at Part Load)	-12.4 to +12.4% (O2S Adaptation at Idle)	x1x1x100
11. EGR Test	IDLE	04/155 Do Not Exit	650–750 RPM	-10 to +10% (O2S Adaptation at Part Load)	-12.4 to +12.4% (O2S Adaptation at Idle)	x1x1x100
12. Secondary Air System Test	IDLE for 20 seconds then check specs.	04/160 Do Not Exit	At least 140°F (60°C) (Coolant Temp.)	0.7% (Secondary Air Valve Open)	25% (Secondary Air Pump Running)	1x11x100
13. Fuel Tank Leak Test	IDLE for 20 seconds, then check specs. (Do not load engine or test will abort).	04/150 Do Not Exit	0 to 100% (Opening Degrees)	Min. -6.3 to +6.3% 0.36 g/s (O2S Control)	Min. -6.3 to +6.3% 0.36 g/s (Idling Control)	1110x100
14. After CAT Oxygen Sensor Aging Test	IDLE for 30 seconds, then check specs.	04/131 Do Not Exit	650–750 RPM	0.01 to 1.00 V (O2S after CAT)	-1200 to +1200 ms (O2S aging)	xx11x100
15. Before CAT Oxygen Sensor Aging Test	Increase to 2500–3500 RPM. Check specs after 120 seconds.	04/130 Do Not Exit	3000–3500 RPM	0 to 2 s (seconds)	10 (Period Counter)	111x100
16. Catalytic Converter Test	Increase to 2500–3500 RPM. Check specs after 120 seconds.	04/136	3000–3500 RPM	Min. 680°F (360°C) (Exh. Gas Temp.)	max. 0.15 (Amplitude Ratio)	1111x100
NOTE: For most of these monitors, the 4th channel does not read ADP OK. Instead, if monitors have run OK, 0 & 1 digits will match exactly as in chart.						

Chapter 3: Volkswagen Readiness Code Charts—Engine Code AES: 1998–99 Eurovan 2.8L VR6

Table 3-8. Engine Code AES: 1998–99 Eurovan 2.8L VR6 (sheet 3 of 3)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
17. After CAT Oxygen Sensor Test	Increase engine speed until Exh. temp is 680°F (360°C) minimum. Then check specs at idle.	04/116 Do Not Exit	0 to 1200 ms (switching time delay of O2 after CAT)	Min. 680°F (360°C) (Exh. Gas Temp.)	min. 0.6 V (O2S voltage after CAT)	1011x100
18. Before CAT Oxygen Sensor Test	(Same as step 17)	04/115 Do Not Exit	Min. 140°F (60°C) (Coolant temp.)	Approx. 680°F (360°C) (Exh. Gas Temp.)	Fluctuating voltage (O2S Voltage before CAT)	1011x100
19. Before CAT Oxygen Sensor Heater Test	(Same as step 17)	04/120	Min. 680°F (360°C) (Exh. Gas Temp.)	120 seconds (Time between O2S heating & start of test)	4.5 to 15.6 ohm (O2S before CAT Heater resistance)	1111x100
20. After CAT Oxygen Sensor Heater Test	(Same as step 17)	04/121	Min. 680°F (360°C) (Exh. Gas Temp.)	120 seconds (Time between O2S heating & start of test)	4.5 to 15.6 ohm (O2S before CAT heater resistance)	1111x100
21. Knock Sensor Test, Bank 1	Increase to at least 3000 RPM. Check specs after 1 min.	04/145	min. 3000 RPM	max. 7 (Amplification factor for knock sensor signal)	0 (Open Circuit in wiring counter)	xxxx x100
22. Knock Sensor Test, Bank 2	Increase to at least 3000 RPM. Check specs after 1 min.	04/146				
23. Readiness Code Setting Check	Exit out and check readiness codes to view completed monitors.	Exit, Select 15	00000000			
NOTE: For most of these monitors, the 4th channel does not read ADP OK. Instead, if monitors have run OK, 0 & 1 digits will match exactly as in chart.						

Table 3-9. Engine Code AFP: 2000–02 Golf, GTI & Jetta 2.8 VR6

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060			Counter counts to 9	ADP.OK
4. Oxygen Sensor Aging Test	Engine on, brake pedal pressed	04/034	1350–1450 RPM			B1-S1 OK
5. Catalytic Converter Test	Engine on, brake pedal pressed	04/046	1350–1450 RPM	752 to 1202°F (400 to 650°C)		CAT B1 OK
6. Secondary Air System Test	IDLE	04/077	650–8500 RPM		CHECK END	SYST.OK
7. EVAP System Diagnosis Test	IDLE	04/070			Max. 2.20 s	EVAP OK
8. Fuel Tank Leak Test	IDLE	04/071	Reed op		Max. 0.55	SYST.OK
9. Readiness Code Setting Check	IDLE	Exit, Select 15	00000000			
NOTE: Brake pedal MUST be pressed for ECM-controlled idle increase.						

Chapter 3: Volkswagen Readiness Code Charts—Engine Code AHA: 1998–99 Passat 2.8L

Table 3-10. Engine Code AHA: 1998–99 Passat 2.8L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Readiness Code Setting Check	Key On, Engine Off	08/086	01101101	11111111	00111111	00011111
4. Throttle Body Adaptation Test	Key On, Engine Off	04/098	3.255 to 4.745V	0.902 to 4.863V	IDLE	ADP.OK
5. Before and After CAT Oxygen Sensor Readiness Check	2000–2500 RPM	08/030	111 (See note below)	111	111	111
6. Before CAT Oxygen Sensor Response Time Test	1800–2200 RPM	04/034	1800–2200 RPM	0.8 to 2.5 ms	0.00 to 2.1 s	B1-S1 OK
7. Before CAT Oxygen Sensor Response Time Test	1800–2200 RPM	04/035	1800–2200 RPM	0.8 to 2.5 ms	0.00 to 2.1 s	
8. Catalytic Converter Test	1800–2200 RPM	04/046	0.00 to 0.28	0 to 2	58.6 s	CAT B1 OK
9. Catalytic Converter Test	1800–2200 RPM	04/047	0.00 to 0.2	0 to 2	58.6 s	
10. EVAP System Diagnosis Test	IDLE	04/070	-%	-5.5 to +6.3%	max. 0.2 g/s	EVAP OK
11. Fuel Tank Leak Test	IDLE	04/071	Reed cl.		CHECK END	SYST.OK
12. Secondary Air System Test	IDLE	04/077				
13. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			
Note for Step 5: ACTIVE = 1, NONACTIVE = 2; 111: 1st digit = O2 Control Active, 2nd digit = HO2S Operational, 3rd digit = OH2S Heater ON (3rd digit toggles ON/OFF with engine warm.						

Table 3-11. Engine Code AHA: 2000 Passat 2.8L (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	8 to 18%	80 to 90%	0 to 8	ADP.OK
4. Kickdown Adaptation Test (Auto Trans only)	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	12 to 97%	4 to 94%	KICKDOWN	ADP.OK
5. Fuel Tank Leak Test	IDLE	04/071			CHECK END	SYST.OK
6. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%			EVAP OK
7. Closed Loop Fuel Control Test	IDLE	04/107	630–820 RPM	-10 to +10	-10 to +10	SYST.OK
8. Oxygen Sensor Heater Test	1800–2200 RPM	04/04	0 to 0.9 kohm	Htg.bC ON	0 to 0.9 kohm	Htg.aC ON
9. Oxygen Sensor Heater Test	1800–2200 RPM	04/042				
10. After CAT Oxygen Sensor Test	IDLE	04/036	0 to 1V	B1-S2 OK	0 to 1V	
11. Before CAT Oxygen Sensor Response Time Test	1000–2400 RPM	04/034	1000–2400 RPM	More than 716°F (380°C)	0.1 to 1.8 s	B1-S1 OK
12. Before CAT Oxygen Sensor Response Time Test	1000–2400 RPM	04/035	1000–2400 RPM	More than 716°F (380°C)	0.1 to 1.8 s	B2-S1 OK
13. Oxygen Sensor Test	IDLE	04/037	12 to 26%	0 to 1V	-800 to +800 ms	SYST.OK
14. Oxygen Sensor Test	IDLE	04/038				
15. After CAT Oxygen Sensor Aging Test	IDLE	04/043	1800–2400 RPM	More than 716°F (380°C)	0 to 1V	B1-S2 OK

Chapter 3: Volkswagen Readiness Code Charts—Engine Code AHA: 2000 Passat 2.8L

Table 3-11. Engine Code AHA: 2000 Passat 2.8L (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
16. After CAT Oxygen Sensor Aging Test	IDLE	04/044	1800–2400 RPM	More than 716°F (380°C)	0 to 1V	B2-S2 OK
17. Catalytic Converter Test	1800–2400 RPM	04/046	1800–2400 RPM	More than 788°F (420°C)	Auto 0 to 0.50 Man 0 to 0.55	CAT B1 OK
18. Catalytic Converter Test	1800–2400 RPM	04/047	1800–2400 RPM	More than 788°F (420°C)	Auto 0 to 0.50 Man 0 to 0.55	CAT B2 OK
19. Secondary Air System Test	IDLE	04/077	630–820 RPM	0 to 5 g/s	-80 to +20%	SYST.OK
20. Secondary Air System Test	IDLE	04/078				
21. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Table 3-12. Engine Code APH: 1999–2001 New Beetle 1.8L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060			Counter counts up to 8 or 9 during adaptation	ADP OK
4. Before CAT Oxygen Sensor Aging Test, Bank 1	IDLE	04/034	IDLE	Catalyst temp must be More than 662°F (350°C)		
5. Catalytic Converter Test	2280–2760 RPM	04/046	2280–2760 RPM	More than 752°F (400°C)	Man Trans Less than 0.33; A/T Less than 0.40	CAT B1 OK
6. Secondary Air System Test	IDLE	04/077	820–860 RPM			SYST.OK
7. EVAP System Diagnosis Test	IDLE	04/070				TBV OK or SYST.OK
8. Fuel Tank Leak Test	IDLE	04/071			CHECK END	SYST.OK
9. Readiness Code Setting Check	IDLE	Exit, Select 15	00000000			

Chapter 3: Volkswagen Readiness Code Charts—Engine Code ATQ: 2000–03 Passat 2.8L

Table 3-13. Engine Code ATQ: 2000–03 Passat 2.8L (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	8 to 18%	80 to 90%	0 to 8	APD OK
4. Kickdown Adaptation Test (Auto Trans only)	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	12 to 97%	4 to 94%	KICKDOWN	ADP OK
5. Fuel Tank Leak Test	IDLE	04/071			CHECK END	SYST.OK
6. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%			EVAP OK
7. Closed Loop Fuel Control Test	IDLE	04/107	630–820 RPM	-10 to +10	-10 to +10	SYST.OK
8. Oxygen Sensor Heater Test	1800–2200 RPM	04/04	0 to 0.9 kohm	Htg.bC ON	0 to 0.9 kohm	Htg.aC ON
9. Oxygen Sensor Heater Test	1800–2200 RPM	04/042				
10. After CAT Oxygen Sensor Test	IDLE	04/036	0 to 1V	B1-S2 OK	0 to 1V	
11. Before CAT Oxygen Sensor Response Time Test	1000–2400 RPM	04/034	1000–2400 RPM	More than 716°F (380°C)	0.1 to 1.8 s	B1-S1 OK
12. Before CAT Oxygen Sensor Response Time Test	1000–2400 RPM	04/035	1000–2400 RPM	More than 716°F (380°C)	0.1 to 1.8 s	B2-S1 OK
13. Oxygen Sensor Test	IDLE	04/037	12 to 26%	0 to 1V	-800 to +800 ms	SYST.OK
14. Oxygen Sensor Test	IDLE	04/038				
15. After CAT Oxygen Sensor Aging Test	IDLE	04/043	1800–2400 RPM	More than 716°F (380°C)	0 to 1V	B1-S2 OK

Table 3-13. Engine Code ATQ: 2000–03 Passat 2.8L (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
16. After CAT Oxygen Sensor Aging Test	IDLE	04/044	1800–2400 RPM	More than 716°F (380°C)	0 to 1V	B2-S2 OK
17. Catalytic Converter Test	1800–2400 RPM	04/046	1800–2400 RPM	More than 788°F (420°C)	Auto 0 to 0.58 Man 0 to 0.62	CAT B1 OK
18. Catalytic Converter Test	1800–2400 RPM	04/047	1800–2400 RPM	More than 788°F (420°C)	Auto 0 to 0.58 Man 0 to 0.62	CAT B2 OK
19. Secondary Air System Test	IDLE	04/077	630–820 RPM	0 to 5 g/s	-80 to +20%	SYST.OK
20. Secondary Air System Test	IDLE	04/078				
21. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Chapter 3: Volkswagen Readiness Code Charts—Engine Code ATW: 1999 Passat 1.8L

Table 3-14. Engine Code ATW: 1999 Passat 1.8L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	8 to 60%	60 to 94%	0 to 8	ADP OK
4. Kickdown Adaptation Test (Auto Trans only)	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	12 to 97%	4 to 94%	KICKDOWN	
5. Before CAT Oxygen Sensor Response Time Test	1800–2200 RPM	04/034	1800–2200 RPM	More than 662°F (350°C)	0 to 1.0 s	B1-S1 OK
6. After CAT Oxygen Sensor Test	IDLE	04/036	0.5 to 0.95V	B1-S2 OK		
7. Oxygen Sensor Test	IDLE	04/037	15 to 30%	0.1 to 0.9V	-150 to +150 ms	SYST.OK
8. After CAT Oxygen Sensor Aging Test	1800–2200 RPM	04/043	1800–2200 RPM	More than 662°F (350°C)	0.1 to 0.9V	B1-S2 OK
9. Catalytic Converter Test	1800–2200 RPM	04/046	1800–2200 RPM	More than 662°F (350°C)	0.1 to 0.4	CAT B1 OK
10. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%	-7 to +7%		EVAP OK
11. Fuel Tank Leak Test	IDLE	04/071			CHECK END	SYST.OK
12. Secondary Air System Test	IDLE	04/077	740–920 RPM	140 to 212°F (60 to 100°C)	4 to 10 g/s	
13. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Table 3-15. Engine Code ATW: 2000–01 Passat 1.8L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	8 to 60%	60 to 94%	0 to 9	ADP.OK
4. Kickdown Adaptation Test (Auto Trans Only)	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	12 to 97%	4 to 94%	KICKDOWN	
5. Closed Loop Fuel Control Test	IDLE	04/107	800–900 RPM	-8 to +8%		SYST.OK
6. Fuel Tank Leak Test	IDLE	04/071	Closed/Open		CHECK END	
7. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%			EVAP OK
8. Heated Oxygen Sensor	1800–2200 RPM	04/041	0 to 2.0 kohm	Htg..bC ON	0 to 2.0 kohm	Htg..bC ON
9. After CAT Oxygen Sensor Test	IDLE	04/036	0.5 to 0.95V	B1-S2 OK		
10. Before CAT Oxygen Sensor Response Time Test	1800–2200 RPM	04/034	1800–2200 RPM	More than 662°F (350°C)	0 to 1.0 s	B1-S1 OK
11. Oxygen Sensor Test	IDLE	04/037	12 to 30%	0.1 to 0.9V	-150 to +150 ms	SYST.OK
12. After CAT Oxygen Sensor Aging Test	1800–2200 RPM	04/043	1800–2200 RPM	More than 662°F (350°C)	0.1 to 0.9V	B1-S2 OK
13. Catalytic Converter Test	1800–2200 RPM	04/046	1800–2200 RPM	More than 752°F (400°C)	0.0 to 0.29	CAT B1 OK
14. Secondary Air System Test	IDLE	04/077	740–920 RPM	2 to 5 g/s	4 to 10 g/s	SYST.OK
15. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Chapter 3: Volkswagen Readiness Code Charts—Engine Code AUG: 2001 Passat 1.8L

Table 3-16. Engine Code AUG: 2001 Passat 1.8L (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	8 to 60%	60 to 94%	0 to 8	ADP.OK
4. Kickdown Adaptation Test (Auto Trans Only)	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	79 to 94%	79 to 94%	KICKDOWN	
5. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%			EVAP OK
6. Before CAT Oxygen Sensor Response Time Test	2300–2800 RPM	04/034	2300–2800 RPM	More than 662°F (350°C)	0.5 to 2.5	B1-S1 OK
7. After CAT Oxygen Sensor Test	IDLE	04/036	0.1 to 0.9V	B1-S2 OK		
8. Oxygen Sensor Test	IDLE	04/037	13 to 45%	0.1 to 0.9V	Less than 0.02	SYST.OK
9. After CAT Oxygen Sensor Aging Test	2300–2800 RPM	04/043	2300–2800 RPM	More than 662°F (350°C)	0.1 to 0.9V	B1-S2 OK
10. Fuel Tank Leak Test	IDLE	04/071			CHECK END	SYST.OK
11. Secondary Air System Test	IDLE	04/077	740–920 RPM	2 to 5 g/s	More than -20%	
12. Catalytic Converter Test	2300–2500 RPM	04/046	2300–2500 RPM	1022 to 1292°F (550 to 700°C)	More than 2.5	CAT B1 OK
13. Closed Loop Fuel Control Test	IDLE	04/107	800–900 RPM	-8 to +8%		SYST.OK
14. Camshaft Timing Test	More than 1080 RPM	04/094	More than 1080 RPM	CS - ctr. ON	SYST.OK	
15. Misfire Activity Check	IDLE	08/014	740–920 RPM	13 to 45%	0	activated

Table 3-16. Engine Code AUG: 2001 Passat 1.8L (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
16. Oxygen Sensor Heater Check	IDLE	08/041		Htg..bC ON	Less than 2.0 kohm	Htg..aC ON
17. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Chapter 3: Volkswagen Readiness Code Charts—Engine Code AVH: 2001–03 New Golf, New Jetta & New Beetle 2.0L

Table 3-17. Engine Code AVH: 2001–03 New Golf, New Jetta & New Beetle 2.0L (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060			8	ADAP. OK
4. Fuel Tank Leak Test	IDLE	04/202				xx0xx1x0
5. Knock Sensor Check	ROAD TEST: More than 3000 RPM	08/203				xxxxx100
6. Vehicle Speed Check	ROAD TEST: More than 3000 RPM	08/204				xxxxx100
7. Before CAT Oxygen Sensor Heater Check	Depress brake pedal and hold, press accelerator to full throttle.	08/205				xxxxx100
8. Before CAT Oxygen Sensor Aging Test	(Same as step 7)	04/212				xxxxx100
9. Fuel Trim Part Throttle Adaptation Test	(Same as step 7)	04/216				xxxxx100
10. Mass Airflow Sensor Test	(Same as step 7)	04/218				00000x00
11. After CAT Oxygen Sensor Heater Test	(Same as step 7)	04/219			392 to 1112°F (200 to 600°C)	xxxxx100
12. After CAT Oxygen Sensor Test	(Same as step 7)	04/221			392 to 1112°F (200 to 600°C)	000xx100
13. After CAT Oxygen Sensor Test	(Same as step 7)	04/224				xxxxx100
14. Catalytic Converter	(Same as step 7)	04/226			842 to 1364°F (450 to 740°C)	xxxxx100
15. Fuel Trim Idle Adaptation Test	IDLE	04/216				xxxx1100
16. EVAP System Diagnosis Test	IDLE	04/228				xxxxx100
NOTE: Brake pedal must remain pressed and held during test in order for test to run and complete with ECM controlled RPM.						

Table 3-17. Engine Code AVH: 2001–03 New Golf, New Jetta & New Beetle 2.0L (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
17. Secondary Air System Test	IDLE	04/229				xxxxx100
18. Fuel Trim Idle Adaptation Test	IDLE	04/231				xxxxx100
19. Readiness Code Setting Check	IDLE	Exit, Select 15	00000000			
NOTE: Brake pedal must remain pressed and held during test in order for test to run and complete with ECM controlled RPM.						

Chapter 3: Volkswagen Readiness Code Charts—Engine Code AWD: 2000–01 Golf, GTI, Jetta & New Beetle 1.8L

Table 3-18. Engine Code AWD: 2000–01 Golf, GTI, Jetta & New Beetle 1.8L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Temperature Check	1800–2500 RPM	08/004	1800–2500 RPM			
4. Closed Loop Fuel Control Check	1800–2500 RPM	08/030	----- 11			
5. Closed Loop Fuel Control Test	IDLE	04/107	640–840 RPM	-23 to +23%		SYST.OK
6. EVAP System Diagnosis Test	IDLE	04/070	0 to 10%		More than 30%	EVAP OK
7. After CAT Oxygen Sensor Test	IDLE	04/036	Less than 0.4 V or More than 0.5 V	B1-S2 OK		
8. After CAT Oxygen Sensor Aging Test	1800–2500 RPM	04/043	1800–2500 RPM	More than 572°F (300°C)	0.1 to 0.9V	B1-S2 OK
9. Camshaft Timing Test	1800–2500 RPM	04/094	1800–2500 RPM	CS-ctr.1 ON/OFF	SYST.OK	
10. Knock Sensor Test	1800–2500 RPM	04/028	1800–2500 RPM	12–25%	More than 104°F (40°C)	SYST.OK
11. Before CAT Oxygen Sensor Response Time Test	1800–2500 RPM	04/034	1800–2500 RPM	More than 662°F (350°C)	More than 0.5	B1-S1 OK
12. Oxygen Sensor Test	IDLE	04/037	12 to 30%	0.1 to 0.9V	-1200 to +1200 ms	SYST.OK
13. Catalytic Converter Test	1800–2500 RPM	04/046	1800–2500 RPM	More than 752°F (400°C)	0.0 to 0.32	CAT B1 OK
14. Fuel Tank Leak Test	IDLE	04/071			CHECK END	SYST.OK
15. Secondary Air System Test	IDLE	04/077		5 to 12 g/s	More than -45%	
16. Misfire Activity Check	IDLE	08/014	640–820 RPM	12 to 30%	0	activated
17. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Table 3-19. Engine Code AWM: 2001–03 Passat 1.8L 4-cylinder (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
Test Requirements (in addition to those listed in “Readiness Code Setting Requirements” on page 7): • Emergency brake engaged • Manual transmission in neutral/Automatic transmission in “P” or “N” • Coolant temperature more than 176°F (80°C)						
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	8 to 60%	60 to 94%	0 to 8	ADP.OK
4. Kickdown Adaptation Test (Auto Trans Only)	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	79 to 94%	79 to 94%	KICKDOWN	
5. Measurement Block 001 Test	WARM UP	04/001	700–6600 RPM	176 to 230°F (80 to 110°C)	-10 to +10	11111111
6. Closed Loop Fuel Control Test	IDLE	04/107	700–860 RPM	-8% to +8%		SYST.OK
7. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%	-7% or +7%		TBV OK
8. Knock Sensor Test	Depress brake pedal and hold, press accelerator to full throttle.	04/028	preset RPM	More than 13%	More than 176°F (80°C)	SYST.OK
9. Before CAT Oxygen Sensor Response Time Test	(Same as step 8)	04/034	preset RPM	More than 662°F (350°C)	0.5 to 2.5	B1-P1 OK
10. Before CAT Oxygen Sensor Test	IDLE	04/036	0.1 to 0.9V	B1-P2 OK		
11. Oxygen Sensor Test	IDLE	04/037	13 to 45%	0.1 to 0.9V	-0.02 to +0.02	SYST.OK
12. Before CAT Oxygen Sensor Aging Test	(Same as step 8)	04/043	preset RPM	More than 662°F (350°C)	0.1 to 0.9V	B1-P2 OK
NOTE: For all steps except check and clear memory, you must press N to exit the test, then re-enter and press Y to begin the test. See “Sample Procedure 2: VW Engine ID Code AWM” on page 13 for more information.						

Chapter 3: Volkswagen Readiness Code Charts—Engine Code AWM: 2001–03 Passat 1.8L 4-cylinder

Table 3-19. Engine Code AWM: 2001–03 Passat 1.8L 4-cylinder (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
13. Catalytic Converter Test	(Same as step 8)	04/046	preset RPM	550–700°C	More than 2.0	CAT B1 OK
14. Camshaft Timing Test	(Same as step 8)	04/094	preset RPM	CS-ctr. ON	SYST.OK	
15. Fuel Tank Leak Test	IDLE	04/071			Check END	SYST.OK
16. Secondary Air System Test	IDLE	04/077	700–860 RPM	1 to 10 g/s	-50% to +30%	
17. Misfire Activity Check	IDLE	04/014	700–860 RPM	13 to 45%	Less than 5	activated
18. Oxygen Sensor Heater Test	IDLE	04/041		Htg. before CAT. ON/OFF (fluctuates)	Less than 0.02 kohm	Htg. after CAT. ON
19. Readiness Code Setting Check	IDLE	08/086	00000000			
NOTE: For all steps except check and clear memory, you must press N to exit the test, then re-enter and press Y to begin the test. See “Sample Procedure 2: VW Engine ID Code AWM” on page 13 for more information.						

Table 3-20. Engine Code AWP: 2001–02 New Beetle

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	10 to 88%	89 to 11%	0 to 8	ADP.OK
4. Temperature Check	IDLE	08/004	700–810 RPM	12 to 15V	140 to 176°F (60 to 80°C)	Max. 140°F (60°C)
5. Fuel Tank Leak Test	IDLE	04/071	Reed cl.		CHECK END	SYST.OK
6. Oxygen Sensor Control and Heater Check	IDLE	08/030	x11	xxx		
7. Closed Loop Fuel Control Test	IDLE	04/107	700–810 RPM	-10% to +10%		SYST.OK
8. Before CAT Oxygen Sensor Aging Test	1800–2200 RPM	04/034	1800–2200 RPM	Min. 662°F (350°C)	0.5 to 1.99	B1-S1 OK
9. After CAT Oxygen Sensor Test	1800–2200 RPM	04/036	0.1 to 0.4V or 0.5 to 0.9V	B1-S2 OK		
10. After CAT Oxygen Sensor Aging Test	1800–2200 RPM	04/043	1800–2200 RPM	Min 572°F (300°C)	0.1 to 0.9V	B1-S2 OK
11. Oxygen Sensor Test	1800–2200 RPM	04/037	12 to 30%	0.1 to 0.9V	-0.02 to +0.02	SYST.OK
12. Catalytic Converter Test	1800–2200 RPM	04/046	1800–2200 RPM	Min. 820°F (440°C)	0.0 to 0.2	CAT B1 OK
13. EVAP System Diagnosis Test	IDLE	04/070	0.0 to 10.0%	-7% to +7%	Min. 50%	EVAP OK
14. Secondary Air System Test	IDLE	04/077	700–810 RPM	5.0 to 12.0 g/s	Min. 30%	SYST.OK
15. Misfire Activity Check	IDLE	08/014	640–820 RPM	12 to 30%	0	ACTIVATED
16. Readiness Code Setting Check	IDLE	Exit, Select 15	00000000			

Chapter 3: Volkswagen Readiness Code Charts—Engine Code AWP: 2003 New Beetle

Table 3-21. Engine Code AWP: 2003 New Beetle

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	3 to 93%	97 to 3%	0 to 8	ADP.OK
4. Temperature Check	IDLE	08/004	640–860 RPM	12 to 15V	140 to 176°F (60 to 80°C)	Max. 176°F (80°C)
5. Fuel Tank Leak Test	IDLE	04/071	Reed cl.		CHECK END	SYST.OK
6. Oxygen Sensor Control and Heater Check	IDLE	08/030	x11	xxx		
7. EVAP System Diagnosis Test	IDLE	04/170	0 to 100%	-7% to +7%	Min. 30%	EVAP.OK
8. Before CAT Oxygen Sensor Aging Test	Press and hold the gas and brake pedals to the floor until Channel 1 reads 1800–2200 RPM.	04/034	1800–2200 RPM	Min. 662°F (350°C)	0.5 to 2.5 s	B1-S1 OK
9. Secondary Air System Test	IDLE	04/077	640–860 RPM	5.0 to 12.0 g/s	-45 to 100%	SYST.OK
10. Oxygen Sensor Test	1800–2200 RPM	04/037	12 to 30%	0.1 to 0.9V	-0.02 to 0.02	
11. After CAT Oxygen Sensor Aging Test	(Same as step 8)	04/043	1800–2200 RPM	Min 572°F (300°C)	0.1 to 0.9V	B1-S2 OK
12. After CAT Oxygen Sensor Test	1800–2200 RPM	04/036	0.1 to 0.4V or 0.5 to 0.9V	B1-S2 OK		
13. Catalytic Converter Test	(Same as step 8)	04/046	1800–2200 RPM	Min. 820°F (440°C)	0.0 to 0.32	CAT B1 OK
14. Readiness Code Setting Check	IDLE	Exit, Select 15	00000000			

Table 3-22. Engine Code AWW: 2000–02 New Beetle 1.8L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060			Counter counts up to 8 or 9 during adaptation	ADP OK
4. Before CAT Oxygen Sensor Aging Test, Bank 1	1800–2200 RPM	04/034	1800–2200 RPM	More than 662°F (350°C)	O2V 0.00 to 1.00	
5. Catalytic Converter Test	1800–2200 RPM	04/046	1800–2200 RPM	More than 824°F (440°C)	Less than 0.32	CAT B1 OK
6. Secondary Air System Test	IDLE	04/077	640–820 RPM	5 to 12 g/s Air Mass for Secondary Air	More than –45% Relative coolant temp	SYST.OK
7. EVAP System Diagnosis Test	IDLE	04/070				TBV OK or SYST.OK
8. Fuel Tank Leak Test	IDLE	04/071	Reed Closed		CHECK END	SYST.OK
9. Readiness Code Setting Check	IDLE	Exit, Select 15	00000000			

Chapter 3: Volkswagen Readiness Code Charts—Engine Code AWW: 2003 New Beetle 1.8L

Table 3-23. Engine Code AWW: 2003 New Beetle 1.8L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	10 to 88%	89 to 11%	0 to 8	ADP.OK
4. Temperature Check	IDLE	08/004	700–810 RPM	12.0 to 15.0V	140 to 176°F (60 to 80°C)	Max. 140°F (60°C)
5. Fuel Tank Leak Test	IDLE	04/071	Reed cl.	More than 824°F (440°C) Catalyst Temp	CHECK END	SYST. OK
6. Oxygen Sensor Control and Heater Check	IDLE	08/030	x11	xxx		
7. Closed Loop Fuel Control Test	IDLE	04/107	700–810 RPM	-10 to +10%		SYST. OK
8. Before CAT Oxygen Sensor Aging Test	1800–2200 RPM	04/034	1800–2200 RPM	Min. 662°F (350°C)	0.5 to 1.99	B1-S1 OK
9. After CAT Oxygen Sensor Test	1800–2200 RPM	04/036	0.1 to 0.4V or 0.5 to 0.9V	B1-S2 OK		
10. After CAT Oxygen Sensor Aging Test	1800–2200 RPM	04/043	1800–2200 RPM	Min. 572°F (300°C)	0.1 to 0.9V	B1-S2 OK
11. Oxygen Sensor Test	1800–2200 RPM	04/037	12 to 30%	0.1 to 0.9V	-0.02 to +0.02	SYST. OK
12. Catalytic Converter Test	1800–2200 RPM	04/046	1800–2200 RPM	Min. 440°C	0.0 to 0.20	CAT B1 OK
13. EVAP System Diagnosis Test	IDLE	04/070	0 to 10%	-7 to +7%	Min. 50%	EVAP OK
14. Secondary Air System Test	IDLE	04/077	700–810 RPM	5.0 to 12.0 g/s	Min. 30%	SYST. OK
15. Readiness Code Setting Check	IDLE	Exit, Select 15	00000000			

Table 3-24. Engine Code AWW: 2000–03 Jetta & Golf 1.8L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	3 to 93%	97 to 3%	0 to 8	ADP.OK
4. Temperature Check	IDLE	08/004	640–820 RPM	8.0 to 15.0V	140 to 176°F (60 to 80°C)	Max. 176°F (80°C)
5. Fuel Tank Leak Test	IDLE	04/071	Reed cl.		Check END	SYST.OK
6. Closed Loop Fuel Control Test	IDLE	04/107	640–820 RPM	-23% to +23%		
7. EVAP System Diagnosis Test	IDLE	04/070	0 to 10%	-7% to +7%	Min. 30%	EVAP OK
8. After CAT Oxygen Sensor Test	1800–2200 RPM	04/036	0.1 to 0.4 V or 0.5 to 0.9 V	B1-S2 OK		
Steps 9 and 10 are optional if the test vehicle is equipped with variable camshaft control and knock sensors.						
9. Camshaft Timing Test	1800–2200 RPM	04/094	1800–2200 RPM		SYST.OK	
10. Knock Sensor Test	1800–2200 RPM	04/028	1800–2200 RPM	12 to 25%	More than 104°F (40°C)	SYST.OK
11. After CAT Oxygen Sensor Aging Test	1800–2200 RPM	04/043	1800–2200 RPM	Min. 572°F (300°C)	0.1 to 0.9V	B1-S2 OK
12. Oxygen Sensor Check	1800–2200 RPM	08/030	x11	xxx		
13. Oxygen Sensor Aging Before CAT	1800–2200 RPM	04/034	1800–2200 RPM	Min. 662°F (350°C)	0.5 to 2.5 s	B1-S1 OK
14. Oxygen Sensor CAT Control Dwell Time Test	1800–2200 RPM	04/037	12 to 30%	0.1 to 0.9 V	-0.02 to +0.02	SYST.OK
15. Catalytic Converter Test	1800–2200 RPM	04/046	1800–2200 RPM	Min. 824°F (440°C)	0.0 to 0.32	CAT B1 OK
16. Secondary Air System Test	IDLE	04/077	640–820 RPM	5.0 to 12.0 g/s	-45% to +100%	SYST.OK
17. Misfire Activity Check	IDLE	08/014	640–820 RPM	12 to 30%	0	ACTIVATED
18. Readiness Code Setting Check	Key On, Engine Off	Exit, Select 15	00000000			

Chapter 3: Volkswagen Readiness Code Charts—Engine Code AXK: 2001–03 Eurovan 2.8L VR6

Table 3-25. Engine Code AXK: 2001–03 Eurovan 2.8L VR6 (sheet 1 of 4)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060			0 to 8	ADP OK
4. Kickdown Adaptation Test (Auto Trans Only)	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063			KICKDOWN	
5. Fuel Tank Leak Test	IDLE: Specification: xxxxx100 is indicated in Display Field 4	04/202	NOTE: During this work step, the diagnostic pump can start repeated diagnostic procedures until specified value is obtained, depending on how much fuel is in the fuel tank. If a diagnostic time of 3 minutes is exceeded, there may be a leak. (Check DTC entry.)			xxxxx100 NOTE: May take up to 30 seconds.
6. Knock Control Test	ROAD TEST: 1) Accelerate in 1st gear until approx. 3000 RPM is reached. 2) Run briefly at approx. 3000 RPM until Channel 4 reads as indicated.	04/203				xxxxx100
7. Vehicle Speed Test	ROAD TEST: 1) Accelerate until a speed of more than 3000 RPM is reached. 2) Abruptly close throttle valve.	04/204	NOTE: Deceleration indication must be obtained once for approx. 3 seconds performed in 1st gear.			xxxxx100
NOTE: Brake pedal must remain pressed and held during test in order for test to run and complete with ECM controlled RPM.						

Table 3-25. Engine Code AXK: 2001–03 Eurovan 2.8L VR6 (sheet 2 of 4)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
8. Before CAT Oxygen Sensor Heater Test	IDLE: 1) Depress brake pedal and hold, press accelerator to full throttle. Engine speed raised to approx. 2300 RPM by the ECM. 2) Let engine run at increased RPM (about 40 seconds) until Channel 4 reads as indicated.	04/205 Do Not Exit				xxxxx100
9. Intake Camshaft to Crankshaft Position Test	(Same as step 8)	04/208				xxxxx100
10. Exhaust Camshaft to Crankshaft Position Test	(Same as step 8)	04/209				xxxxx100
11. Intake Camshaft Adjustment Test	(Same as step 8)	04/210				xxxxx100
12. Exhaust Camshaft Adjustment Test	(Same as step 8)	04/211				xxxxx100
13. Before CAT Oxygen Sensor Aging Test	(Same as step 8)	04/212	NOTE: If monitor does not set, check 08/046 to view CAT temperature. Raise CAT temp. to at least 662°F (350°C) via an engine speed of approx. 3500 RPM and repeat this step.			xxxxx100
14. Fuel Trim Part Throttle Adaptation Test	IDLE 1) Depress brake pedal and hold, press accelerator to full throttle. Engine speed raised to approx. 2300 RPM by the ECM. 2) Let engine run at increased RPM (about 75 seconds) until Channel 4 reads as indicated.	04/216				xxxxx100
15. Mass Airflow Sensor Test	(Same as step 14)	04/218 Do Not Exit	NOTE: This procedure may last approx. 4 minutes.			xxxxx100
NOTE: Brake pedal must remain pressed and held during test in order for test to run and complete with ECM controlled RPM.						

Chapter 3: Volkswagen Readiness Code Charts—Engine Code AXK: 2001–03 Eurovan 2.8L VR6

Table 3-25. Engine Code AXK: 2001–03 Eurovan 2.8L VR6 (sheet 3 of 4)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
16. After CAT Oxygen Sensor Heater Test	(Same as step 14)	04/220				xxxxx100
17. After CAT Oxygen Sensor Test	IDLE 1) Depress brake pedal and hold, press accelerator to full throttle. Engine speed raised to approx. 2300 RPM by the ECM. 2) Let engine run at increased RPM (about 30 seconds) until Channel 4 reads as indicated.	04/222 Do Not Exit				xxxxx100
18. After CAT Oxygen Sensor Aging Test	IDLE 1) Depress brake pedal and hold, press accelerator to full throttle. Engine speed raised to approx. 2300 RPM by the ECM. 2) Let engine run at increased RPM (about 15 seconds) until Channel 4 reads as indicated.	04/225 Do Not Exit				xxxxx100
19. Catalytic Converter Test NOTE: After this work step, the ECM returns to the condition "IDLE"	IDLE: 1) Depress brake pedal and hold, press accelerator to full throttle. Engine speed raised to approx. 2300 RPM by the ECM. 2) Let engine run at increased RPM (about 60 seconds) until Channel 4 reads as indicated. 3) Release the accelerator and brake pedal, then let engine run at IDLE.	04/227 Do Not Exit				xxxxx100
NOTE: Brake pedal must remain pressed and held during test in order for test to run and complete with ECM controlled RPM.						

Table 3-25. Engine Code AXK: 2001–03 Eurovan 2.8L VR6 (sheet 4 of 4)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
20. Fuel Tank Leak Test	IDLE: Approx. 30 seconds until Channel 4 reads as indicated.	04/216 Do Not Exit				xxxxx100
21. EVAP System Diagnosis Test	(Same as step 20)	04/229 Do Not Exit				xxxxx100
22. Secondary Air System Test	(Same as step 20)	04/231				xxxxx100
23. Readiness Code Setting Check	Exit out and check Readiness Code to view completed monitors	Exit, Select 15	00000000			
NOTE: Brake pedal must remain pressed and held during test in order for test to run and complete with ECM controlled RPM.						

Chapter 3: Volkswagen Readiness Code Charts—Engine Code AZG: 2001–03 New Golf, New Jetta & New Beetle 2.0L

Table 3-26. Engine Code AZG: 2001–03 New Golf, New Jetta & New Beetle 2.0L (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060			8	ADP.OK
4. Fuel Tank Leak Test	IDLE	04/202				xx0xx1x0
5. Knock Sensor Check	ROAD TEST: More than 3000 RPM	08/203				xxxxx100
6. Vehicle Speed Check	ROAD TEST: More than 3000 RPM	08/204				
7. Before CAT Oxygen Sensor Heater Check	Depress brake pedal and hold, press accelerator to full throttle.	08/205				
8. Before CAT Oxygen Sensor Aging Test	(Same as step 7)	04/212				
9. Fuel Trim Part Throttle Adaptation Test	(Same as step 7)	04/216				
10. Mass Airflow Sensor Test	(Same as step 7)	04/218				00000x00
11. After CAT Oxygen Sensor Heater Test	(Same as step 7)	04/219			392 to 1112°F (200 to 600°C)	xxxxx100
12. After CAT Oxygen Sensor Test	(Same as step 7)	04/221			392 to 1112°F (200 to 600°C)	000xx100
13. After CAT Oxygen Sensor Test	(Same as step 7)	04/224				xxxxx100
14. Catalytic Converter Test	(Same as step 7)	04/226			842 to 1364°F (450 to 740°C)	
15. Fuel Trim Idle Adaptation Test	IDLE	04/216				xxxx1100
NOTE: Brake pedal must remain pressed and held during test in order for test to run and complete with ECM controlled RPM.						

Table 3-26. Engine Code AZG: 2001–03 New Golf, New Jetta & New Beetle 2.0L (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
16. EVAP System Diagnosis Test	IDLE	04/228				xxxxx100
17. Secondary Air System Test	IDLE	04/229				
18. Fuel Trim Idle Adaptation Test	IDLE	04/231				
19. Readiness Code Setting Check	IDLE	Exit, Select 15	00000000			
NOTE: Brake pedal must remain pressed and held during test in order for test to run and complete with ECM controlled RPM.						

Chapter 3: Volkswagen Readiness Code Charts—Engine Code BDF: 2001–02 Golf, GTI & Jetta 2.8L VR6

Table 3-27. Engine Code BDF: 2001–02 Golf, GTI & Jetta 2.8L VR6

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	3 to 93%	97 to 3%	8	ADP.OK
4. Temperature Check	IDLE	08/004	640–720 RPM	11.5 to 15.0V	185 to 230°F (85 to 110°C)	Less than 176°F (80°C)
5. Fuel Tank Leak Test	IDLE	04/071	Reed open		Check END	SYST.OK
6. Oxygen Sensor Check	IDLE	08/030	111	xxx		
7. Before CAT Oxygen Sensor Aging Test	Depress brake pedal and hold, press accelerator to full throttle.	04/034	2300 RPM	More than 380°C	1.0 to 2.5	B1-P1 OK
8. Fuel Trim Part Throttle Adaptation Test	(Same as step 7)	04/216				xxxxx100
9. Oxygen Sensor Check	IDLE	08/030	xxx	111		
10. After CAT Oxygen Sensor Aging Test	(Same as step 7)	04/043	2300 RPM	More than 716°F (380°C)	0.1 to 0.9V	B1 P2 OK
11. After CAT Oxygen Sensor Test	IDLE	04/036	0.1 to 0.9V	B1 P2 OK		
12. Catalytic Converter Test	(Same as step 7)	04/046	2300 RPM	More than 716°F (380°C)	0.00 to 0.99	CAT B1 OK
13. Fuel Tank Leak Test	IDLE	04/216				xxxxx1100
14. EVAP System Diagnosis Test	IDLE	04/070				TBV OK
15. Secondary Air System Test	IDLE	04/077	640–720 RPM			SYST. OK
16. Readiness Code Setting Check	IDLE	Exit, Select 15	00000000			

NOTE: For all steps except check and clear memory, you must press **N** to exit the test, then re-enter and press **Y** to begin the test. See “Sample Procedure 2: VW Engine ID Code AWM” on page 13 for more information.

Table 3-28. Engine Code BDF: 2003 Golf & Jetta 2.8L VR6

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060			0 to 8	ADP.OK
4. EVAP System Diagnosis Test	IDLE	04/202				xxxxx100
Enter 04/212 depress gas pedal to full throttle and hold until the test is done, then release the gas pedal and continue to the next step. This test may take several minutes.						
5. Before CAT Oxygen Sensor Aging Test	IDLE	04/212				xxxxx100
With your foot on the brake, enter 04/227 and depress gas pedal to full throttle and hold until the test is done, then release the gas pedal and continue to the next step. This test may take several minutes.						
6. Catalytic Converter Test	IDLE	04/227				xxxxx100
Remove your foot from the brake.						
7. EVAP System Diagnosis Test	IDLE	04/229				xxxxx100
8. Secondary Air System Test	IDLE	04/231				xxxxx100
9. Readiness Code Setting Check	IDLE	Exit, Select 15	00000000			

Chapter 3: Volkswagen Readiness Code Charts—Engine Code BDP: 2002–03 Passat W8

Table 3-29. Engine Code BDP: 2002–03 Passat W8 (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	3 to 16%	82 to 97%	0 to 8	ADP.OK
4. Kickdown Adaptation Test (Auto Trans Only)	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063			KICKDOWN	
5. Fuel Tank Leak Test	IDLE	04/202				xxxxx100
6. Before CAT Oxygen Sensor Heater Test, Bank 1	Depress brake pedal and hold, press accelerator to full throttle.	04/205				xxxxx100
7. Before CAT Oxygen Sensor Heater Test, Bank 2	(Same as step 6)	04/206				xxxxx100
8. Before CAT Oxygen Sensor Aging Test, Bank 1	(Same as step 6)	04/215			More than 1	xxxxx100
9. Before CAT Oxygen Sensor Aging Test, Bank 1	(Same as step 6)	04/216			More than 1	xxxxx100
10. Fuel Trim Part Throttle Adaptation Test, Bank 1	(Same as step 6)	04/219				xxxxx100
11. Fuel Trim Part Throttle Adaptation Test, Bank 2	(Same as step 6)	04/220				xxxxx100
12. Mass Airflow Sensor Test	(Same as step 6)	04/221				xxxxx100
13. After CAT Oxygen Sensor Heater Test, Bank 1	(Same as step 6)	04/222			392 to 1202°F (200 to 650°C)	xxxxx100
NOTE: For all steps except check and clear memory, you must press N to exit the test, then re-enter and press Y to begin the test. See “Sample Procedure 2: VW Engine ID Code AWM” on page 13 for more information.						

Table 3-29. Engine Code BDP: 2002–03 Passat W8 (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
14. After CAT Oxygen Sensor Heater Test, Bank 2	(Same as step 6)	04/223			200 to 650°C	xxxxx100
15. After CAT Oxygen Sensor Test	(Same as step 6)	04/226				xxxxx100
16. After CAT Oxygen Sensor Aging Test, Bank 1	(Same as step 6)	04/227				xxxxx100
17. After CAT Oxygen Sensor Aging Test, Bank 2	(Same as step 6)	04/228				xxxxx100
18. Catalytic Converter Test, Bank 1	(Same as step 6)	04/229				xxxxx100
19. Catalytic Converter Test, Bank 2	(Same as step 6)	04/230				xxxxx100
20. Fuel Trim Idle Adaptation Test, Bank 1	IDLE	04/219				xxxxx100
21. Fuel Trim Idle Adaptation Test, Bank 2	IDLE	04/220				xxxxx100
22. EVAP System Diagnosis Test	IDLE	04/231				xxxxx100
23. Secondary Air System Test, Bank 1	IDLE	04/232				xxxxx100
24. Secondary Air System Test, Bank 2	IDLE	04/233				xxxxx100
25. Fuel Trim Idle Adaptation Test, Bank 1	IDLE	04/234				xxxxx100
26. Fuel Trim Idle Adaptation Test, Bank 2	IDLE	04/235				xxxxx100
27. Readiness Code Setting Check	IDLE	Exit, Select 15	00000000			
NOTE: For all steps except check and clear memory, you must press N to exit the test, then re-enter and press Y to begin the test. See “Sample Procedure 2: VW Engine ID Code AWM” on page 13 for more information.						

Diesel Engines

Table 3-30. Engine Code 1Z (1996–97): Diesel Engine

Test Conditions
1. Warm up engine until coolant temperature is 77°F (25°C) minimum.
2. Turn the engine off, wait 10 seconds, then restart the engine.
3. Increase engine speed to 2200 RPM.
4. Release the accelerator and allow the engine to idle (about 900 RPM).
5. Stop the engine and wait 10 seconds.
6. Start the engine and increase engine speed to 2200 RPM.
7. Release the accelerator and allow the engine to idle (about 900 RPM).
8. Check if readiness codes are set or completed using generic OBD-II testing mode.

Table 3-31. Engine Codes 1Z (1998), AHU (1998–99) and ALH (1998–2001): Diesel Engines

Test Conditions
1. Start the engine and increase the speed to 2200 RPM, release throttle and allow engine to return to idle (900 RPM), stop the engine, and waiting approximately 10 seconds, then repeat.
2. Exit and select 15 to check Readiness Code settings. If settings are not OK, continue with the next steps.
3. Start the engine and let it idle for 35 seconds minimum.
4. Test drive vehicle and maintain 2000 RPM in 3rd gear (manual transmissions) or 2nd gear (automatic transmissions) for 5 seconds minimum.
5. Accelerate from an engine speed of 2200 RPM to WOT in 2nd or 3rd gear for 8 seconds.
6. Park the vehicle, switch off the engine, and wait approximately 10 seconds. Repeat steps 3–6 and check for readiness code settings with generic OBD-II testing mode using Snap-on® Domestic or Asian Imports Vehicle Communication Software. NOTE: For ALH, you can check readiness codes with the procedure on page 6.

Table 3-32. Engine Code ALH (2002–03): Diesel Engine

Test Conditions	
1.	Switch the ignition on and wait 5 seconds.
2.	Start the engine and let it idle for 45 seconds.
3.	Perform the following road test: – In 3rd gear, accelerate with the gas pedal fully depressed, accelerating from 31 MPH (50 KPH) to 75 MPH (120 KPH). – Drive on a level surface for two minutes in 4th gear, maintaining a constant engine speed between 1700 and 1900 RPM.
4.	Park the vehicle and switch the ignition off.
5.	Wait 15 seconds, then switch the ignition switch back on.
6.	Wait 5 seconds, then start the engine and let it run at idle for 45 seconds.
7.	Repeat the road test in step 3.
8.	Park the vehicle but do not shut the engine off—let it idle for three minutes without touching the gas pedal.
9.	Check readiness codes with the procedure for diesel engines on page 6.

Chapter 4: Audi Readiness Code Charts

The following charts contain readiness code information for Audi vehicles.

Table 4-1. Engine Code ABZ: 1997–99 A8/S8 4.2L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Readiness Code Setting Check	Key On, Engine Off	08/036	01100101	11111101	00010111	00010111
4. Before CAT Oxygen Sensor Check, Banks 1 & 2	IDLE	08/026	-0.170 to 0.900V	-0.170 to 0.900V	B1-S1 ON	B1-S1 ON
5. Before CAT Oxygen Sensor Response Time Test, Bank 1	1800–2200 RPM	04/029	1800–2200 RPM	Min. 572°F (300°C)	0.5 to 2.5 s	B1-S1 OK
6. Before CAT Oxygen Sensor Response Time Test, Bank 2	1800–2200 RPM	04/030	1800–2200 RPM	Min. 572°F (300°C)	0.5 to 2.5 s	B2-S1 OK
7. Catalytic Converter Test, Bank 1	1800–2200 RPM	04/031	1800–2200 RPM	Min. 572°F (300°C)	0.00 to 0.30	CAT B1 OK
8. Catalytic Converter Test, Bank 2	1800–2200 RPM	04/032	1800–2200 RPM	Min. 572°F (300°C)	0.00 to 0.30	CAT B2 OK
9. EVAP System Diagnosis Test	IDLE	04/033		-5.5 to +6.3%	Max. 0.2 g/s	EVAP OK
10. Fuel Tank Leak Test	IDLE	04/034			CHECK END	SYST.OK
11. Readiness Code Setting Check	IDLE	08/036 or Exit, Select 15	00000000			

Table 4-2. Engine Code AEB: 1997–99 A4 1.8L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Readiness Code Setting Check	Key On, Engine Off	08/086	11100101/ 01100101	11111101	00011111	00000000
4. Throttle Body Adaptation Test	Key On, Engine Off	04/060	0 to 25°	0 to 25°	IDLE	ADP.OK
5. Before and After CAT Oxygen Sensor Heater Check	1800–2200 RPM	08/030	111	111		
6. Before CAT Oxygen Sensor Response Time Test	1800–2200 RPM	04/034	1800–2200 RPM	0.8 to 2.0 ms	0.0 to 3.3 s	B1-S1 OK
7. Catalytic Converter Test	1800–2200 RPM	04/046	0.0 to 1.0	0 to 2	58.6 s	CAT B1 OK NOTE: May take up to 1 min. before test runs (Test ON).
8. EVAP System Diagnosis Test	IDLE	04/070		-5.4 to 9.4%		
9. Fuel Tank Leak Test	IDLE	04/071				
10. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Chapter 4: Audi Readiness Code Charts—Engine Code AEB: 2000 A4 1.8L

Table 4-3. Engine Code AEB: 2000 A4 1.8L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	8 to 60%	60 to 94%	0 to 9	ADP.OK
4. Kickdown Adaptation Test	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	12 to 97%	4 to 94%	KICKDOWN	
5. Closed Loop Fuel Control Test	IDLE	04/107	800–900 RPM	-8% to +8%		SYST.OK
6. Fuel Tank Leak Test	IDLE	04/071			Check END	SYST.OK
7. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%			EVAP OK
8. Oxygen Sensor Heater Test	1800–2200 RPM	04/041	0 to 2.0 kohm	Htg..bC ON	0 to 2.0 kohm	Htg..bC ON
9. After CAT Oxygen Sensor Test	IDLE	04/036	0.5 to 0.095V	B1-S2 OK		
10. Before CAT Oxygen Sensor Response Time Test	1800–2200 RPM	04/034	1800–2200 RPM	More than 662°F (350°C)	0 to 1.0 s	B1-S1 OK
11. Oxygen Sensor Test	IDLE	04/037	12 to 30%	0.1 to 0.9V	-150 ms to +150 ms	SYST.OK
12. After CAT Oxygen Sensor Aging Test	1800–2200 RPM	04/043	1800–2200 RPM	More than 662°F (350°C)	0.1 to 0.9V	B1-S2 OK
13. Catalytic Converter Test	1800–2200 RPM	04/046	1800–2200 RPM	More than 752°F (400°C)	0.0 to 0.29	CATB1 OK
14. Secondary Air System Test	IDLE	04/077	740–920 RPM	2 to 5 g/s	4 to 10 g/s	SYST.OK
15. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Table 4-4. Engine Code AEW: 1997–99 A8/S8 3.7L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Readiness Code Setting Check	Key On, Engine Off	08/036	01100101	11111101	00010111	00010111
4. Before CAT Oxygen Sensor Check, Banks 1 & 2	IDLE	08/026	-0.170 to 0.900V	-0.170 to 0.900V	B1-S1 ON	B1-S1 ON
5. Before CAT Oxygen Sensor Response Time Test, Bank 1	1800–2200 RPM	04/029	1800–2200 RPM	Min. 572°F (300°C)	0.5 to 2.5 s	B1-S1 OK
6. Before CAT Oxygen Sensor Response Time Test, Bank 2	1800–2200 RPM	04/030	1800–2200 RPM	Min. 572°F (300°C)	0.5 to 2.5 s	B2-S1 OK
7. Catalytic Converter Test, Bank 1	1800–2200 RPM	04/031	1800–2200 RPM	Min. 572°F (300°C)	0.00 to 0.30	CAT B1 OK
8. Catalytic Converter Test, Bank 2	1800–2200 RPM	04/032	1800–2200 RPM	Min. 572°F (300°C)	0.00 to 0.30	CAT B2 OK
9. EVAP System Diagnosis Test	IDLE	04/033		-5.5 to +6.3%	Max. 0.2 g/s	EVAP OK
10. Fuel Tank Leak Test	IDLE	04/034			CHECK END	SYST.OK
11. Readiness Code Setting Check	IDLE	08/036 or Exit, Select 15	00000000			

Chapter 4: Audi Readiness Code Charts—Engine Code AFC: 1996–98 A4/S4, A6/S6, and Cabriolet

Table 4-5. Engine Code AFC: 1996–98 A4/S4, A6/S6, and Cabriolet

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Readiness Code Setting Check	Key On, Engine Off	08/029*	111_11_1	000_00_0	0	0
4. Warm up engine, Temperature Check	IDLE	08/001	More than 158°F (70°C)			
5. A mixed city and highway drive is required. The necessary driving conditions for the test drive are listed below: Speed: 50–62 MPH for 1½–5 minutes RPM: 1800–2700 RPM. Manual Transmissions in 4th or 5th gear, Automatics in “D”rive. Drive Profile: At specified speed (50–62 MPH), implement a short deceleration phase (5–8 s), then resume steady MPH/RPM. Drive Time: Approximately 1.5–5 minutes, as long as necessary.						
6. Readiness Code Setting Check	IDLE	08/029 or Exit, Select 15	000_00_0			
* If display field 1 in display group 029 reads “1” instead of “0”, and/or a malfunction relating to the exhaust system is stored in the DTC memory, you must use display group 017 for a selective diagnosis. Since exhaust gas recirculation is switched off during Basic Setting (04), diagnosis of the EGR throughput is evaluated only in Read Measuring Value Block (08). The diagnosis is only considered OK when the EGR temperature is greater than 122°F (50°C) during reading time. Diagnosis of the EGR flow is active when the following conditions are met: coolant temperature is greater than 46°F (8°C); vehicle is in constant drive with an engine speed of 2000–3000 RPM; engine load is 30–60%.						

Table 4-6. Engine Code AHA: 1997–99 A4/S4/A6/S6 2.8L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Readiness Code Setting Check	Key On, Engine Off	08/086	01101101	11111111	00111111	00011111
4. Throttle Body Adaptation Test	Key On, Engine Off	04/098	3.255 to 4.745V	0.902 to 4.863V	IDLE	ADP.OK
5. Before and After CAT Oxygen Sensor Heater Check	2000–2500 RPM	08/030	111*	111	111	111
6. Before CAT Oxygen Sensor Response Time Test	1800–2200 RPM	04/034	1800–2200 RPM	0.8 to 2.5 ms	0.00 to 2.1 s	B1-S1 OK
7. Before CAT Oxygen Sensor Response Time Test	1800–2200 RPM	04/035	1800–2200 RPM	0.8 to 2.5 ms	0.00 to 2.1 s	B1-S1 OK
8. Catalytic Converter Test	1800–2200 RPM	04/046	0.00 to 0.28	0 to 2	58.6 s	CAT B1 OK
9. Catalytic Converter Test	1800–2200 RPM	04/047	0.00 to 0.2	0 to 2	58.6 s	CAT B1 OK
10. EVAP System Diagnosis Test	IDLE	04/070		-5.5 to +6.3%	Max. 0.2 g/s	EVAP OK
11. Fuel Tank Leak Test	IDLE	04/071	Reed cl.		CHECK END	SYST.OK
12. Secondary Air System Test	IDLE	04/077				SYST.OK
13. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			
* ACTIVE = 1, NONACTIVE = 2; 111: 1st digit = O2 Control Active, 2nd digit = HO2S Operational, 3rd digit = OH2S Heater ON (3rd digit toggles ON/OFF with engine warm.						

Chapter 4: Audi Readiness Code Charts—Engine Code AKB: 2000 A8 4.2L

Table 4-7. Engine Code AKB: 2000 A8 4.2L (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	10 to 20%	80 to 90%	0 to 8	ADP OK
4. Kickdown Adaptation Test (Auto Trans Only)	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	12 to 92%	2 to 47%	KICKDOWN	ADP OK
5. Fuel Tank Leak Test	IDLE	04/071			CHECK END	SYST.OK
6. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%			SYST.OK
7. Closed Loop Fuel Control Test	IDLE	04/107	650–730 RPM	-10 to +10%	-10 to +10%	SYST.OK
8. Oxygen Sensor Heater Test	1800–2200 RPM	04/041	0 to 0.9 kohm	Htg.bC ON	0 to 0.9 kohm	Htg.bC ON
9. Oxygen Sensor Heater Test	1800–2200 RPM	04/042				
10. After CAT Oxygen Sensor Test	IDLE	04/036	0 to 1V	B1-S2 OK	0 to 1V	B1-S2 OK
11. Before CAT Oxygen Sensor Response Time Test	IDLE	04/034	650–730 RPM	More than 392°F (200°C)	0.1 to 1.0 s	B1-S1 OK
12. Before CAT Oxygen Sensor Response Time Test	IDLE	04/035	650–730 RPM	More than 392°F (200°C)	0.1 to 1.0 s	B2-S1 OK
13. Oxygen Sensor Test	IDLE	04/037	13.5 to 22.5%	0.1 to 0.01V	-800 to +800 ms	SYST.OK
14. Oxygen Sensor Test	IDLE	04/038				
15. After CAT Oxygen Sensor Aging Test	IDLE	04/043	650–730 RPM	More than 446°F (230°C)	0 to 1V	B1-S2 OK

Table 4-7. Engine Code AKB: 2000 A8 4.2L (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
16. After CAT Oxygen Sensor Aging Test	IDLE	04/044	650–730 RPM	More than 446°F (230°C)	0 to 1V	B2-S2 OK
17. Catalytic Converter Test	1800–2400 RPM	04/046	1900–2400 RPM	More than 662°F (350°C)	0 to 0.25	CAT B1 OK
18. Catalytic Converter Test	1800–2400 RPM	04/047	1900–2400 RPM	More than 662°F (350°C)	0 to 0.25	CAT B2 OK
19. Secondary Air System Test	1800–2400 RPM	04/077	1800–2400 RPM	More than 13 g/s	-70 to +30%	SYST.OK
20. Secondary Air System Test	1800–2400 RPM	04/078				
21. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Chapter 4: Audi Readiness Code Charts—Engine Code AMB: 2002–03 A4 and Cabrio 1.8L

Table 4-8. Engine Code AMB: 2002–03 A4 and Cabrio 1.8L (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
Test Requirements (in addition to those listed in “Readiness Code Setting Requirements” on page 7): • Emergency brake engaged • Manual transmission in Neutral, automatic transmission in Park/Neutral position (PNP) • Coolant temperature more than 176°F (80°C)						
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	8 to 60%	60 to 94%	0–8	ADP.OK
4. Kickdown Adaptation Test (Auto Trans Only)	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	79 to 94%	79 to 94%	KICKDOWN	
5. Measurement Block 001 Test	IDLE Warm up engine	04/001	700–6600 RPM	176 to 230°F (80 to 110°C)	-10 to +10	11111111
6. Closed Loop Fuel Control Test	IDLE	04/107	700–860 RPM	-8% to +8%		SYST.OK
7. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%	-7% or +7%	-30 to +100%	EVAP OK
8. Knock Sensor Test	Engine on Press gas pedal and brake pedal simultaneously	04/028	2300 RPM	More than 13%	More than 176°F (80°C)	SYST. OK
9. Before CAT Oxygen Sensor Response Time Test	(Same as step 8)	04/034	2300 RPM	More than 662°F (350°C)	0.5 to 2.5	B1-S1 OK
10. After CAT Oxygen Sensor Test	(Same as step 8)	04/036	0.1 to 0.9V	B1-S2 OK		
11. Oxygen Sensor Test	IDLE	04/037	13 to 45%	0.1 to 0.9V	-0.02 to +0.02	SYST. OK
12. Oxygen Sensor Heater Test	IDLE	04/041		Htg. After CAT ON	Less than 0.02	Htg. After CAT ON
NOTE: For all steps except check and clear memory, you must press N to exit the test, then re-enter and press Y to begin the test. See “Sample Procedure 2: VW Engine ID Code AWM” on page 13 for more information.						

Table 4-8. Engine Code AMB: 2002–03 A4 and Cabrio 1.8L (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
13. After CAT Oxygen Sensor Aging Test	(Same as step 8)	04/043	2300 RPM	More than 662°F (350°C)	0.1 to 0.9V	B1-S2 OK
14. Catalytic Converter Test	(Same as step 8)	04/046	2000 RPM	1022 to 1292°F (550 to 700°C)	More than 2.0	CAT B1 OK
15. Camshaft Timing Test	(Same as step 8)	04/094	1200 RPM	CS—ctr. ON	SYST. OK	
16. Fuel Tank Leak Test	IDLE	04/071			CHECK END	SYST. OK
17. Secondary Air System Test	IDLE	04/077	700 to 860 RPM	1 to 10 g/s	-50 to +30%	
18. Misfire Activity Check	IDLE	04/014	700 to 860 RPM	13 to 45%	Less than 5	PREPARED
19. Readiness Code Setting Check	IDLE	04/086 or Exit, Select 15	00000000			
NOTE: For all steps except check and clear memory, you must press N to exit the test, then re-enter and press Y to begin the test. See “Sample Procedure 2: VW Engine ID Code AWM” on page 13 for more information.						

Chapter 4: Audi Readiness Code Charts—Engine Code AMU: 2001–02 TT 1.8L

Table 4-9. Engine Code AMU: 2001–02 TT 1.8L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Readiness Code Setting Check	Key On, Engine Off	04/060	8 to 60%	60 to 94%	0 to 8	ADP OK
4. Fuel Tank Leak Test	IDLE	04/071			CHECK END	SYST.OK
5. EVAP System Diagnosis Test	IDLE	04/070	0 to 10%	0 to 30%		EVAP OK
6. Closed Loop Fuel Control Test	IDLE	04/107	700–820 RPM	-23 to +23%		SYST.OK
7. Oxygen Sensor Heater Test	1800–2200 RPM	04/041	Less than 2 kohm	Htg.bC ON	Less than 2 kohm	Htg.bC ON
8. After CAT Oxygen Sensor Test	IDLE	04/036	Less than 0.4V or More than 0.5V	B1-S2 OK		
9. Secondary Air System Test	1800–2200 RPM	04/077	1800–2200 RPM	5 to 12 g/s	2 to 5 g/s	SYST.OK
10. Before CAT Oxygen Sensor Response Time Test	1800–2200 RPM	04/034	1800–2200 RPM	More than 662°F (350°C)	0 to 3.3 s	B1-S1 OK
11. Oxygen Sensor Test	IDLE	04/037	12 to 30%	0.1 to 0.9V	-1200 to +1200 ms	SYST.OK
12. After CAT Oxygen Sensor Aging Test	1800–2200 RPM	04/043	1800–2200 RPM	More than 752°F (400°C)	0.1 to 0.9V	B1-S2 OK
13. Catalytic Converter Test	1800–2200 RPM	04/046 04/047	1800–2200 RPM	More than 752°F (400°C)		CAT B1 OK
14. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Table 4-10. Engine Code APB: 2001–02 A6 2.7L (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	3 to 20%	80 to 97%	0 to 8	APD OK
4. Kickdown Adaptation Test (Auto Trans Only)	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063		78 to 94%	KICKDOWN	ADP OK
5. Fuel Tank Leak Test	IDLE	04/071			CHECK END	SYST.OK
6. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%			EVAP OK
7. Closed Loop Fuel Control Test	IDLE	04/107	640–920 RPM	-18 to +18	-18 to +18	SYST.OK
8. Oxygen Sensor Heater Test	1800–2200 RPM	04/04	0 to 0.5 kohm	Htg.bC ON	0 to 0.5 kohm	Htg.aC ON
9. Oxygen Sensor Heater Test	1800–2200 RPM	04/042				
10. After CAT Oxygen Sensor Test	IDLE	04/036	0 to 1V	B1-S2 OK	0 to 1V	B2-S2 OK
11. Before CAT Oxygen Sensor Response Time Test	1520–2280 RPM	04/034	1520–2280 RPM	More than 500°F (260°C)	0.4 to 1.0 s	B1-S1 OK
12. Before CAT Oxygen Sensor Response Time Test	1520–2280 RPM	04/035	1520–2280 RPM	More than 500°F (260°C)	0.4 to 1.0 s	B2-S1 OK
13. Oxygen Sensor Test	IDLE	04/037	0 to 30%	0 to 1V	-150 to +150 ms	SYST.OK
14. Oxygen Sensor Test	IDLE	04/038	0 to 30%	0 to 1V	-150 to +150 ms	SYST.OK
15. After CAT Oxygen Sensor Aging Test	IDLE	04/043	700–3000 U/min	More than 662°F (350°C)	0 to 1V	B1-S2 OK

Chapter 4: Audi Readiness Code Charts—Engine Code APB: 2001–02 A6 2.7L

Table 4-10. Engine Code APB: 2001–02 A6 2.7L (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
16. Oxygen Sensor Aging After CAT	IDLE	04/044	700–3000 U/min	More than 662°F (350°C)	0 to 1V	B2-S2 OK
17. Catalytic Converter Test	1800–2280 RPM	04/046	1800–2280 RPM	More than 599°F (315°C)	0 to 0.80	CAT B1 OK
18. Catalytic Converter Test	1800–2280 RPM	04/047	1800–2280 RPM	More than 599°F (315°C)	0 to 0.80	CAT B2 OK
19. Secondary Air System Test (Auto Trans Only)	IDLE	04/077	640–920 RPM	0 to 5 g/s	-40 to +10%	SYST.OK
20. Secondary Air System Test (Auto Trans Only)	IDLE	04/078	640–920 RPM	0 to 5 g/s	-40 to +10%	SYST.OK
21. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Table 4-11. Engine Code ART: 2000 A6 4.2L (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	10 to 20%	80 to 90%	0 to 8	ADP OK
4. Kickdown Adaptation Test (Auto Trans Only)	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	12 to 92%	2 to 47%	KICKDOWN	ADP OK
5. Fuel Tank Leak Test	IDLE	04/071			CHECK END	SYST.OK
6. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%			SYST.OK
7. Closed Loop Fuel Control Test	IDLE	04/107	650–730 RPM	-10 to +10%	-10 to +10%	SYST.OK
8. Oxygen Sensor Heater Test	1800–2200 RPM	04/041	0 to 0.9 kohm	Htg.bC ON	0 to 0.9 kohm	Htg.bC ON
9. Oxygen Sensor Heater Test	1800–2200 RPM	04/042				
10. After CAT Oxygen Sensor Test	IDLE	04/036	0 to 1V	B1-S2 OK	0 to 1V	B1-S2 OK
11. Before CAT Oxygen Sensor Response Time Test	IDLE	04/034	650–730 RPM	More than 392°F (200°C)	0.1 to 1.0 s	B1-S1 OK
12. Before CAT Oxygen Sensor Response Time Test	IDLE	04/035	650–730 RPM	More than 392°F (200°C)	0.1 to 1.0 s	B2-S1 OK
13. Oxygen Sensor Test	IDLE	04/037	13.5 to 22.5%	0.1 to 0.01V	-800 to +800 ms	SYST.OK
14. Oxygen Sensor Test	IDLE	04/038				
15. After CAT Oxygen Sensor Aging Test	IDLE	04/043	650–730 RPM	More than 446°F (230°C)	0 to 1V	B1-S2 OK

Chapter 4: Audi Readiness Code Charts—Engine Code ART: 2000 A6 4.2L

Table 4-11. Engine Code ART: 2000 A6 4.2L (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
16. After CAT Oxygen Sensor Aging Test	IDLE	04/044	650–730 RPM	More than 446°F (230°C)	0 to 1V	B2-S2 OK
17. Catalytic Converter Test	1800–2400 RPM	04/046	1900–2400 RPM	More than 662°F (350°C)	0 to 0.25	CAT B1 OK
18. Catalytic Converter Test	1800–2400 RPM	04/047	1900–2400 RPM	More than 662°F (350°C)	0 to 0.25	CAT B2 OK
19. Secondary Air System Test	1800–2400 RPM	04/077	1800–2400 RPM	More than 13 g/s	-70 to +30%	SYST.OK
20. Secondary Air System Test	1800–2400 RPM	04/078				
21. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Table 4-12. Engine Code ATC: 2000–01 TT 1.8L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
Test Requirements (in addition to those listed in “Readiness Code Setting Requirements” on page 7):						
• Coolant temperature more than 176°F (80°C)						
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	8 to 60%	60 to 94%	0 to 8	ADP.OK
4. Fuel Tank Leak Test	IDLE	04/071			CHECK END	SYST. OK
5. EVAP System Diagnosis Test	IDLE	04/070	0 to 10%		0 to 30%	EVAP OK
6. Closed Loop Fuel Control Test	IDLE	04/107	640–920 RPM	-23 to +23%		SYST. OK
7. Camshaft Timing Test	1800–2200 RPM	04/094	1800–2200 RPM	CS-ctr.1 ON/OFF	SYST. OK	
8. Knock Sensors Test	1800–2200 RPM	04/028	1800–2200 RPM	12 to 25%	More than 104°F	SYST. OK
9. Oxygen Sensor Heater Test	1800–2200 RPM	04/041	Less than 2 kohm	Htg.bC ON	Less than 2 kohm	Htg.aC ON
10. Before CAT Oxygen Sensor Test	IDLE	04/036	Less than 0.4V or More than 0.5V	B1-S2 OK		
11. Before CAT Oxygen Sensor Response Time Test	1800–2200 RPM	04/034	1800–2200 RPM	More than 662°F (350°C)	0 to 207s	B1-S1 OK
12. Oxygen Sensor Test	IDLE	04/037	12 to 30%	0.1 to 0.9V	-1200ms to +1200ms	SYST. OK
13. Before CAT Oxygen Sensor Aging Test	1800–2200 RPM	04/043	1800–2200 RPM	More than 572°F (300°C)	0.1 to 0.9V	B1-S2 OK
14. Secondary Air System Test	IDLE	04/077	640–820 RPM	5–12 g/s	More than -45%	SYST. OK
15. Catalytic Converter Test	1800–2200 RPM	04/046	1800–2200 RPM	More than 752°F (400°C)	0.0 to 0.35	CAT B1 OK
16. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Chapter 4: Audi Readiness Code Charts—Engine Code ATQ: 2000–01 A4/S4; A6/S6 2.8L

Table 4-13. Engine Code ATQ: 2000–01 A4/S4; A6/S6 2.8L (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	8 to 18%	80 to 90%	0 to 8	APD OK
4. Kickdown Adaptation Test (Auto Trans Only)	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	12 to 97%	4 to 94%	KICKDOWN	ADP OK
5. Fuel Tank Leak Test	IDLE	04/071			CHECK END	SYST.OK
6. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%			EVAP OK
7. Closed Loop Fuel Control Test	IDLE	04/107	630–820 RPM	-10 to +10	-10 to +10	SYST.OK
8. Oxygen Sensor Heater Test	1800–2200 RPM	04/04	0 to 0.9 kohm	Htg.bC ON	0 to 0.9 kohm	Htg.aC ON
9. Oxygen Sensor Heater Test	1800–2200 RPM	04/042				
10. After CAT Oxygen Sensor Test	IDLE	04/036	0 to 1V	B1-S2 OK	0 to 1V	Htg.aC ON
11. Before CAT Oxygen Sensor Response Time Test	1000–2400 RPM	04/034	1000–2400 RPM	More than 716°F (380°C)	0.1 to 1.8 s	B1-S1 OK
12. Before CAT Oxygen Sensor Response Time Test	1000–2400 RPM	04/035	1000–2400 RPM	More than 716°F (380°C)	0.1 to 1.8 s	B2-S1 OK
13. Oxygen Sensor Test	IDLE	04/037	12 to 26%	0 to 1V	-800 to +800 ms	SYST.OK
14. Oxygen Sensor Test	IDLE	04/038				
15. After CAT Oxygen Sensor Aging Test	IDLE	04/043	1800–2400 RPM	More than 716°F (380°C)	0 to 1V	B1-S2 OK

Table 4-13. Engine Code ATQ: 2000–01 A4/S4; A6/S6 2.8L (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
16. After CAT Oxygen Sensor Aging Test	IDLE	04/044	1800–2400 RPM	More than 716°F (380°C)	0 to 1V	B2-S2 OK
17. Catalytic Converter Test	1800–2400 RPM	04/046	1800–2400 RPM	More than 788°F (420°C)	Auto 0 to 0.58 Man 0 to 0.62	CAT B1 OK
18. Catalytic Converter Test	1800–2400 RPM	04/047	1800–2400 RPM	More than 788°F (420°C)	Auto 0 to 0.58 Man 0 to 0.62	CAT B2 OK
19. Secondary Air System Test	IDLE	04/077	630–820 RPM	0–5 g/s	-80 to +20%	SYST.OK
20. Secondary Air System Test	IDLE	04/078				
21. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Chapter 4: Audi Readiness Code Charts—Engine Code ATW: 2000 A4 1.8L

Table 4-14. Engine Code ATW: 2000 A4 1.8L

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	8 to 60%	60 to 94%	0 to 9	ADP.OK
4. Kickdown Adaptation Test (Auto Trans Only)	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	12 to 97%	4 to 94%	KICKDOWN	ADP.OK
5. Closed Loop Fuel Control Test	IDLE	04/107	800–900 RPM	-8 to +8%		SYST.OK
6. Fuel Tank Leak Test	IDLE	04/071	Closed/Open		CHECK END	SYST.OK
7. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%			EVAP OK
8. Oxygen Sensor Heater Test	1800–2200 RPM	04/041	0 to 2.0 kohm	Htg..bC ON	0 to 2.0 kohm	Htg..bC ON
9. After CAT Oxygen Sensor Test	IDLE	04/036	0.5 to 0.95V	B1-S2 OK		
10. Before CAT Oxygen Sensor Response Time Test	1800–2200 RPM	04/034	1800–2200 RPM	More than 662°F (350°C)	0 to 1.0 s	B1-S1 OK
11. Oxygen Sensor Test	IDLE	04/037	12 to 30%	0.1 to 0.9 V	-150 to +150 ms	SYST.OK
12. After CAT Oxygen Sensor Aging Test	1800–2200 RPM	04/043	1800–2200 RPM	More than 662°F (350°C)	0.1 to 0.9 V	B1-S2 OK
13. Catalytic Converter Test	1800–2200 RPM	04/046	1800–2200 RPM	More than 752°F (400°C)	0.0 to 0.29	CAT B1 OK
14. Secondary Air System Test	IDLE	04/077	740–920 RPM	2 to 5 g/s	4 to 10 g/s	SYST.OK
15. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Table 4-15. Engine Code AUX: 2001–03 A8 4.2L (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	10 to 20%	80 to 90%	0 to 8	ADP OK
4. Kickdown Adaptation Test	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	12 to 92%	2 to 47%	KICKDOWN	ADP OK
5. Fuel Tank Leak Test	IDLE	04/071			CHECK END	SYST.OK
6. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%			SYST.OK
7. Closed Loop Fuel Control Test	IDLE	04/107	650–730 RPM	-10 to +10%	-10 to +10%	SYST.OK
8. Oxygen Sensor Test	1800–2200 RPM	04/041	0 to 0.9 kohm	Htg.bC ON	0 to 0.9 kohm	Htg.bC ON
9. Oxygen Sensor Test	1800–2200 RPM	04/042				
10. After CAT Oxygen Sensor Test	IDLE	04/036	0 to 1V	B1-S2 OK	0 to 1V	B1-S2 OK
11. Before CAT Oxygen Sensor Response Time Test	IDLE	04/034	650–730 RPM	More than 392°F (200°C)	0.1 to 1.8 s	B1-S1 OK
12. Before CAT Oxygen Sensor Response Time Test	IDLE	04/035	650–730 RPM	More than 392°F (200°C)	0.1 to 1.8 s	B2-S1 OK
13. Oxygen Sensor Test	IDLE	04/037	13.5 to 22.5%	0.1 to 0.01 V	-800 to +800 ms	SYST.OK
14. Oxygen Sensor Test	IDLE	04/038				
15. Oxygen Sensor Aging After CAT	IDLE	04/043	650–730 RPM	More than 250°C	0 to 1V	B1-S2 OK
16. Oxygen Sensor Aging After CAT	IDLE	04/044	650–730 RPM	More than 250°C	0 to 1V	B2-S2 OK

Chapter 4: Audi Readiness Code Charts—Engine Code AUX: 2001–03 A8 4.2L

Table 4-15. Engine Code AUX: 2001–03 A8 4.2L (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
17. Catalytic Converter Test	1800–2400 RPM	04/046	1900–2400 RPM	752 to 1004°F (400 to 540°C)	0 to 0.25	CAT B1 OK
18. Catalytic Converter Test	1800–2400 RPM	04/047	1900–2400 RPM	752 to 1004°F (400 to 540°C)	0 to 0.25	CAT B2 OK
19. Secondary Air System Test	1800–2400 RPM	04/077	1900–2400 RPM	More than 13 g/s	-70 to +30%	SYST.OK
20. Secondary Air System Test	1800–2400 RPM	04/078				
21. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Table 4-16. Engine Code AVK: 2002–03 A4/A6 3.0L (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
Test Requirements (in addition to those listed in “Readiness Code Setting Requirements” on page 7: • Emergency brake engaged • Manual transmission in Neutral, automatic transmission in PNP • Coolant temperature more than 176°F (80°C)						
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	8 to 18%	80 to 90%	0 to 8	ADP.OK
4. Kickdown Adaptation Test (Auto Trans Only)	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	12 to 97%	4 to 94%	KICKDOWN	ADP.OK
5. Measurement Block 001 Test	IDLE: Warm up engine	04/001	630 to 6800 RPM	176 to 234°F (80 to 112°C)	-10 to +10	-10 to +10
6. Before CAT Oxygen Sensor Response Time Test, Bank 1	Engine on Press gas pedal and brake pedal simultaneously	04/034	Preset Values			B1-S1 OK
7. Before CAT Oxygen Sensor Response Time Test, Bank 2	(Same as step 6)	04/035	Preset Values			B2-S1 OK
8. After CAT Oxygen Sensor Test	(Same as step 6)	04/036	0 to 1V	B1-S2 OK	0 to 1V	B2-S2 OK
NOTE: For all steps except check and clear memory, you must press N to exit the test, then re-enter and press Y to begin the test. See “Sample Procedure 2: VW Engine ID Code AWM” on page 13 for more information.						

Chapter 4: Audi Readiness Code Charts—Engine Code AVK: 2002–03 A4/A6 3.0L

Table 4-16. Engine Code AVK: 2002–03 A4/A6 3.0L (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
9. After CAT Oxygen Sensor Test, Bank 1 * Check software level to determine the correct procedure!	ECM software up to 0003: IDLE ECM software 004 and above: Engine on Press gas pedal and brake pedal simultaneously	04/037	7 to 100%	0 to 1V	-0.05 to +0.05	SYST. OK
10. After CAT Oxygen Sensor Test, Bank 2	(Same as step 6)	04/038				
11. After CAT Oxygen Sensor Test		04/039	1 to 190 g/s	0 to 1V	0 to 1V	SYST. OK
12. After CAT Oxygen Sensor Aging Test, Bank 1	(Same as step 6)	04/043	Preset Values		0 to 1V	B1-S2 OK
13. After CAT Oxygen Sensor Aging Test, Bank 2	(Same as step 6)	04/044	Preset Values		0 to 1V	B2-S2 OK
14. Catalytic Converter Test, Bank 1	(Same as step 6)	04/46	Preset Values	More than 932°F (500°C)	0 to 0.99	CAT B1 OK
15. Catalytic Converter Test, Bank 2	(Same as step 6)	04/047	Preset Values	More than 932°F (500°C)	0 to 0.99	CAT B2 OK
16. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%			EVAP OK
17. Fuel Tank Leak Test	IDLE	04/071				SYST. OK
18. Secondary Air System Test, Bank 1	• Rev to 4000 RPM 2 times before test. • Press gas pedal and brake pedal simultaneously.	04/077	Preset Values	0 to 190 g/s		SYST. OK
19. Secondary Air System Test, Bank 2	(Same as step 18)	04/078	Preset Values	0 to 190 g/s		SYST. OK
20. Readiness Code Setting Checks	IDLE	08/086 or Exit, Select 15	00000000			
NOTE: For all steps except check and clear memory, you must press N to exit the test, then re-enter and press Y to begin the test. See “Sample Procedure 2: VW Engine ID Code AWM” on page 13 for more information.						

Table 4-17. Engine Code AWM: 2001 A4 1.8L (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	8 to 60%	60 to 94%	0 to 8	ADP.OK
4. Kickdown Adaptation Test (Auto Trans only)	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	79 to 94%	79 to 94%	KICKDOWN	
5. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%			EVAP OK
6. Before CAT Oxygen Sensor Response Time Test	2300–2800 RPM	04/034	2300–2800 RPM	More than 662°F (350°C)	0.5 to 2.5	B1-S1 OK
7. After CAT Oxygen Sensor Test	IDLE	04/036	0.1 to 0.9V	B1-S2 OK		
8. Oxygen Sensor Test	IDLE	04/037	13 to 45%	0.1 to 0.9V	Less than 0.02	SYST.OK
9. After CAT Oxygen Sensor Aging Test	2300–2800 RPM	04/043	2300–2800 RPM	More than 662°F (350°C)	0.1 to 0.9V	B1-S2 OK
10. Fuel Tank Leak Test	IDLE	04/071			CHECK END	SYST. OK
11. Secondary Air System Test	IDLE	04/077	740–920 RPM	2 to 5 g/s	More than -20%	
12. Catalytic Converter Test	2300–2500 RPM	04/046	2300–2500 RPM	1022 to 1292°F (550 to 700°C)	More than 2.5	CAT B1 OK
13. Closed Loop Fuel Control Test	IDLE	04/107	800–900 RPM	-8 to +8%		SYST. OK
14. Camshaft Timing Test	More than 1080 RPM	04/094	More than 1080 RPM	CS - ctr. ON	SYST.OK	
15. Misfire Activity Check	IDLE	08/014	740–920 RPM	13 to 45%	0	activated

Chapter 4: Audi Readiness Code Charts—Engine Code AWM: 2001 A4 1.8L

Table 4-17. Engine Code AWM: 2001 A4 1.8L (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
16. Oxygen Sensor Heater Check	IDLE	08/041		Htg..bC ON	Less than 2.0 kohm	Htg..aC ON
17. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Table 4-18. Engine Code AWN: 2001–03 A6 4.2L (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	10 to 20%	80 to 90%	0 to 8	ADP OK
4. Kickdown Adaptation Test (Auto Trans only)	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	12 to 92%	2 to 47%	KICKDOWN	ADP OK
5. Fuel Tank Leak Test	IDLE	04/071			CHECK END	SYST.OK
6. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%			SYST.OK
7. Closed Loop Fuel Control Test	IDLE	04/107	650–730 RPM	-10 to +10%	-10 to +10%	SYST.OK
8. Oxygen Sensor Test	1800–2200 RPM	04/041	0–0.9 kohm	Htg.bC ON	0 to 0.9 kohm	Htg.bC ON
9. Oxygen Sensor Test	1800–2200 RPM	04/042				
10. After CAT Oxygen Sensor Test	IDLE	04/036	0 to 1V	B1-S2 OK	0 to 1V	B1-S2 OK
11. Before CAT Oxygen Sensor Response Time Test	IDLE	04/034	650–730 RPM	More than 392°F (200°C)	0.1 to 1.8 s	B1-S1 OK
12. Before CAT Oxygen Sensor Response Time Test	IDLE	04/035	650–730 RPM	More than 392°F (200°C)	0.1 to 1.8 s	B2-S1 OK
13. Oxygen Sensor Test	IDLE	04/037	13.5 to 22.5%	0.1 to 0.01V	-800 to +800 ms	SYST.OK
14. Oxygen Sensor Test	IDLE	04/038				
15. After CAT Oxygen Sensor Aging Test	IDLE	04/043	650–730 RPM	More than 482°F (250°C)	0 to 1V	B1-S2 OK
16. After CAT Oxygen Sensor Aging Test	IDLE	04/044	650–730 RPM	More than 482°F (250°C)	0 to 1V	B2-S2 OK

Chapter 4: Audi Readiness Code Charts—Engine Code AWN: 2001–03 A6 4.2L

Table 4-18. Engine Code AWN: 2001–03 A6 4.2L (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
17. Catalytic Converter Test	1800–2400 RPM	04/046	1900–2400 RPM	752 to 1004°F (400 to 540°C)	0 to 0.25	CAT B1 OK
18. Catalytic Converter Test	1800–2400 RPM	04/047	1900–2400 RPM	752 to 1004°F (400 to 540°C)	0 to 0.25	CAT B2 OK
19. Secondary Air System Test	1800–2400 RPM	04/077	1900–2400 RPM	More than 13 g/s	-70 to +30%	SYST.OK
20. Secondary Air System Test	1800–2400 RPM	04/078				
21. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Table 4-19. Engine Code AWP: 2001–02 TT 1.8L (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	3 to 93%	97 to 3%	8	ADP OK
4. Oxygen Sensor Test	1800–2200 RPM	04/030	111	110		
5. Before CAT Oxygen Sensor Aging Test, Bank 1	2000 RPM	04/034	2000 RPM	More than 662°F (350°C)	More than 0.5	B1 P1 OK
6. After CAT Oxygen Sensor Test, Bank 1	2000 RPM	04/036	0.1 to 0.95V	B1 S2 OK		
7. Oxygen Sensor Test, Bank 1	2000 RPM	04/037	12 to 30%	0.1 to 0.95V	-0.02 to +0.02	SYST.OK
8. After CAT Oxygen Sensor Aging Test, Bank 1	2000 RPM	04/043	2000 RPM	More than 572°F (300°C)	0.1 to 0.95V	B1 P2 OK
9. Catalytic Converter Test	Front Wheel Drive: 2000 RPM All Wheel Drive: 2400 RPM NOTE: This test takes about 60 seconds.	04/046	Front Wheel Drive: 2000 RPM All Wheel Drive: 2400 RPM	Front Wheel Drive: more than 440°C All Wheel Drive: more than 752°F (400°C)	0 to 3.2	CAT B1 OK
10. EVAP System Diagnosis Test	IDLE NOTE: If the test does not start or the display jumps from “TEST ON” to “TEST OFF”, briefly press the throttle pedal.	04/070	0 to 99%	Less than -7% or More than +7%		TBV OK
11. Fuel Tank Leak Test	IDLE NOTE: This test takes about 90 seconds. NOTE: If you perform this function more than once, open the tank filler cap after each test to release pressure.	04/071	Reed Open		Measurement END	SYST.OK

Chapter 4: Audi Readiness Code Charts—Engine Code AWP: 2001–02 TT 1.8L

Table 4-19. Engine Code AWP: 2001–02 TT 1.8L (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
12. Secondary Air System Test	Quickly press throttle pedal to the floor and release, revving the engine to at least 2500 RPM. NOTE: This test takes about 60 seconds.	04/077	700–820 RPM	5 to 12 g/s	More than –45%	SYST.OK
13. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Table 4-20. Engine Code AWP & BEA: 2003 TT (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
Test Requirements (in addition to those listed in “Readiness Code Setting Requirements” on page 7): • Coolant temperature more than 176°F (80°C)						
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	8 to 60%	60 to 94%	0 to 8	ADP.OK
4. Kickdown Adaptation Test (Auto Trans only)	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	75 to 100%	75 to 100%	KICKDOWN	
5. Fuel Tank Leak Test	IDLE	04/071	Reed cl.		CHECK END	SYST. OK
6. Closed Loop Fuel Control Test	IDLE	04/107	640 to 860 RPM	-23 to +23%		
7. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%	Less than or equal to -7% or More than or equal to +7%	0 to 30%	EVAP OK
8. Camshaft Timing Test	2200–2800 RPM	04/094	2200–2600 RPM	Cs-ctr.1 ON/OFF	SYST. OK	
9. Knock Sensors Test	2200–2800 RPM	04/028	2200–2600 RPM	12 to 25%	More than 104°F (40°C)	SYST. OK
10. Before CAT Oxygen Sensor Response Time Test	1800–2200 RPM	04/034	1800–2200 RPM	More than 662°F (350°C)	More than 0.5	B1-S1 OK
11. Secondary Air System Test	IDLE	04/077	640–840 RPM	Less than 12 g/s	More than -45%	SYST. OK
12. Oxygen Sensor Test	1800–2200 RPM	04/037	12 to 30%	0.1 to 0.9V	-0.02 to +0.02	SYST. OK
13. After CAT Oxygen Sensor Aging Test	1800–2200 RPM	04/043	1800–2200 RPM	More than 572°F (300°C)	0.1 to 0.9V	B1-S2 OK
14. After CAT Oxygen Sensor Test	1800–2200 RPM	04/036	More than 0.4V or Less than 0.5V	B1-S2 OK		

Chapter 4: Audi Readiness Code Charts—Engine Code AWP & BEA: 2003 TT

Table 4-20. Engine Code AWP & BEA: 2003 TT (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
15. Catalytic Converter Test	1800–2200 RPM	04/046	F: 1800–2200 RPM Q: 2200–2800 RPM	F: More than 824°F (440°C) Q: More than 842°F (450°C)	0.0 to 0.32	CAT B1 OK
16. Readiness Code Setting Check	IDLE	08/086	00000000			

Table 4-21. Engine Code AYS: 2001–03 S8 4.2L (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	10 to 20%	80 to 90%	0 to 8	ADP OK
4. Kickdown Adaptation Test	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	12 to 92%	2 to 47%	KICKDOWN	ADP OK
5. Fuel Tank Leak Test	IDLE	04/071			CHECK END	SYST.OK
6. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%			SYST.OK
7. Closed Loop Fuel Control Test	IDLE	04/107	650–730 RPM	-10 to +10%	-10 to +10%	SYST.OK
8. Oxygen Sensor Test	1800–2200 RPM	04/041	0 to 0.9 kohm	Htg.bC ON	0 to 0.9 kohm	Htg.bC ON
9. Oxygen Sensor Test	1800–2200 RPM	04/042				
10. After CAT Oxygen Sensor Test	IDLE	04/036	0 to 1V	B1-S2 OK	0 to 1V	B1-S2 OK
11. Before CAT Oxygen Sensor Response Time Test	IDLE	04/034	760–840 RPM	More than 482°F (250°C)	0.1 to 1.8 s	B1-S1 OK
12. Before CAT Oxygen Sensor Response Time Test	IDLE	04/035	760–840 RPM	More than 482°F (250°C)	0.1 to 1.8 s	B2-S1 OK
13. Oxygen Sensor Test	IDLE	04/037	13.5 to 24%	0.1 to 0.01V	-800 to +800 ms	SYST.OK
14. Oxygen Sensor Test	IDLE	04/038				
15. Oxygen Sensor Aging After CAT	1800–2400 RPM	04/043	1800–2400 RPM	More than 482°F (250°C)	0 to 1V	B1-S2 OK
16. Oxygen Sensor Aging After CAT	1800–2400 RPM	04/044	1800–2400 RPM	More than 482°F (250°C)	0 to 1V	B2-S2 OK

Chapter 4: Audi Readiness Code Charts—Engine Code AYS: 2001–03 S8 4.2L

Table 4-21. Engine Code AYS: 2001–03 S8 4.2L (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
17. Catalytic Converter Test	1800–2400 RPM	04/046	1800–2400 RPM	626 to 1076°F (330 to 580°C)	0 to 0.45	CAT B1 OK
18. Catalytic Converter Test	1800–2400 RPM	04/047	1800–2400 RPM	626 to 1076°F (330 to 580°C)	0 to 0.45	CAT B2 OK
19. Secondary Air System Test	1800–2400 RPM	04/077	1800–2400 RPM	More than 13 g/s	-70 to +30%	SYST.OK
20. Secondary Air System Test	1800–2400 RPM	04/078				
21. Readiness Code Setting Check	IDLE	08/086 or Exit, Select 15	00000000			

Table 4-22. Engine Code BBD: 2002–03 S6 4.2L 8-cylinder (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
Test Requirements (in addition to those listed in “Readiness Code Setting Requirements” on page 7): • Emergency brake engaged • Automatic transmission in PNP • Coolant temperature more than 176°F (80°C)						
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	10 to 20%	80 to 90%	0 to 8	ADP.OK
4. Misfire Activity Check	IDLE*	04/014	760–840 RPM	13.5 to 24%	0 to 5	ACTIVATED
5. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%	-5.5% to +6.3%		EVAP OK
6. Fuel Tank Leak Test	IDLE	04/071			CHECK. END	SYST. OK
7. Before CAT Oxygen Sensor Response Time Test, Bank 1	IDLE	04/034	760–840 RPM	More than 482°F (250°C)	0.1 to 1.8 s	B1-S1 OK
8. Before CAT Oxygen Sensor Response Time Test, Bank 2	IDLE	04/035	760–840 RPM	More than 482°F (250°C)	0.1 to 1.8 s	B2-S1 OK
9. Oxygen Sensor Test, Bank 1	IDLE	04/037	13.5 to 24%	0.1 to 1.0V	-200 to +200 ms	SYST. OK
10. Oxygen Sensor Test, Bank 2	IDLE	04/038				
11. Oxygen Sensor Test	IDLE	04/041	0 to 0.9 kohm	Htg. After CAT ON		Htg. After CAT ON
12. Before and After CAT Oxygen Sensor Test	IDLE	04/030	111	010 or 110	111	010 or 110
13. After CAT Oxygen Sensor Aging Test, Bank 1	1800–2400 RPM	04/043	1800–2400 RPM	~482°F (250°C)	0.0 to 0.1V	B1-S2 OK
14. After CAT Oxygen Sensor Aging Test, Bank 2	1800–2400 RPM	04/044	1800–2400 RPM	~482°F (250°C)	0.0 to 0.1V	B2-S2 OK
* Warm up engine if necessary.						

Chapter 4: Audi Readiness Code Charts—Engine Code BBD: 2002–03 S6 4.2L 8-cylinder

Table 4-22. Engine Code BBD: 2002–03 S6 4.2L 8-cylinder (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
15. Catalytic Converter Test, Bank 1	1800–2400 RPM	04/046	1800–2400 RPM	626 to 1076°F (330 to 580°C)	0 to 0.45	CAT B1 OK
16. Catalytic Converter Test, Bank 2	1800–2400 RPM	04/047	1800–2400 RPM	626 to 1076°F (330 to 580°C)	0 to 0.45	CAT B2 OK
17. Camshaft Timing Test	More than 2000 RPM	04/094	More than 2000 RPM	ON	SYST. OK	SYST. OK
18. Secondary Air System Test, Bank 1	1800–2400 RPM	04/077	1800–2400 RPM	11 to 19 g/s	-70 to +30%	
19. Secondary Air System Test, Bank 2	1800–2400 RPM	04/078				
20. After CAT Oxygen Sensor Test	More than 2200 RPM	04/039	More than 12 g/s	0.1 to 1.0V	0.1 to 1.0V	
21. Readiness Code Setting Checks	IDLE	04/086	00000000			
* Warm up engine if necessary.						

Table 4-23. Engine Code BCY: 2003 A6/S6 4.2L 8-cylinder (sheet 1 of 3)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
Test Requirements (in addition to those listed in “Readiness Code Setting Requirements” on page 7): • The vehicle must be stationary. • Vehicles with automatic transmission must have the selector lever set to P or N. • Coolant temperature must be at least 176°F (80°C.)						
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	3 to 93%	97 to 3%	8	ADP.OK
4. Kickdown Adaptation Test	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063	79 to 94%	79 to 94%	KICKDOWN	ADP.OK
5. EVAP System Diagnosis Test	IDLE	04/070	0 to 99%			TBV OK
6. Fuel Tank Leak Test	• IDLE • ECT more than 185°F (85°C) • IAT less than 185°F (85°C) • Fuel tank cap opened briefly to release pressure • Test may take about 90 seconds	04/071	Reed open		Measurement END	SYST. OK
7. Oxygen Sensor Test, Bank 1	IDLE	04/037	13.5 to 22.5%	0.000 to 1.000V	-200 to +200 ms	SYST. OK
8. Oxygen Sensor Test, Bank 2	IDLE	04/038				
9. Before CAT Oxygen Sensor Aging Test, Bank 1	IDLE	04/034	730–790 RPM	More than 482°F (250°C)	0.2 to 0.8 s	B1-S1 OK
NOTE: If “OK” displays immediately after a display group is selected, the test has already been completed and you may continue to the next step.						

Chapter 4: Audi Readiness Code Charts—Engine Code BCY: 2003 A6/S6 4.2L 8-cylinder

Table 4-23. Engine Code BCY: 2003 A6/S6 4.2L 8-cylinder (sheet 2 of 3)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
10. Before CAT Oxygen Sensor Aging Test, Bank 2	IDLE	04/035	730–790 RPM	More than 482°F (250°C)	0.2 to 0.8 s	B2-S1 OK
11. After CAT Oxygen Sensor, Banks 1 & 2	Depress gas and brake pedals simultaneously (1800 RPM)	04/039		0.100 to 0.950V	0.100 to 0.950V	SYST. OK
12. Oxygen Sensor Heater Test, Bank 1	IDLE (Specifications can be obtained faster by increasing engine speed)	04/041	Less than 1 kohm	Upstream Heating ON	Less than 1 kohm	Downstream Heating ON
13. Oxygen Sensor Heater Test, Bank 2	(Same as step 12)	04/042	Less than 1 kohm	Upstream Heating ON	Less than 1 kohm	Downstream Heating ON
Note for Oxygen Sensor Heater Tests: Do not continue with testing until channels 1 and 3 display less than 0.9 kohm.						
14. After CAT Oxygen Sensor Aging Test, Bank 1	IDLE	04/043	700–790 RPM	392 to 572°F (200 to 300°C)	0.000 to 1.000V	B1-S2 OK
15. After CAT Oxygen Sensor Aging Test, Bank 2	IDLE	04/044	700–790 RPM	392 to 572°F (200 to 300°C)	0.000 to 1.000V	B2-S2 OK
16. Secondary Air System Test, Bank 1	Depress gas and brake pedals simultaneously (2550 RPM)	04/077	2400–2600 RPM	More than 16 g/s	-30 to +30%	SYST. OK
17. Secondary Air System Test, Bank 2	(Same as step 16)	04/078	2400–2600 RPM	More than 16 g/s	-30 to +30%	SYST. OK
Release gas and brake pedals.						
18. Catalytic Converter Test, Bank 1	Depress gas and brake pedals simultaneously (1800 RPM) Diagnosis time = ~40 s Start test when Channel 2 reads ~1004°F (540°C)	04/046	700–790 RPM	752 to 1004°F (400 to 540°C)	0.0 to 0.073	CAT B1 OK
NOTE: If “OK” displays immediately after a display group is selected, the test has already been completed and you may continue to the next step.						

Table 4-23. Engine Code BCY: 2003 A6/S6 4.2L 8-cylinder (sheet 3 of 3)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
19. Catalytic Converter Test, Bank 2	(Same as step 18)	04/047	700–790 RPM	752 to 1004°F (400 to 540°C)	0.0 to 0.073	CAT B2 OK
20. Readiness Code Setting Checks	IDLE	08/086	00000000			
NOTE: If “OK” displays immediately after a display group is selected, the test has already been completed and you may continue to the next step.						

Chapter 4: Audi Readiness Code Charts—Engine Code BEL: 2003 A6 & Allroad 2.7L

Table 4-24. Engine Code BEL: 2003 A6 & Allroad 2.7L (sheet 1 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
Test Requirement (in addition to those listed in “Readiness Code Setting Requirements” on page 7): • Coolant temperature more than 176°F (80°C)						
1. Check DTC Memory	Key On, Engine Off	02				
2. Clear DTC Memory	Key On, Engine Off	05				
3. Throttle Body Adaptation Test	Key On, Engine Off	04/060	3 to 20%	80 to 97%	8	ADP.OK
4. Kickdown Adaptation Test (Auto Trans only)	Key On, Engine Off— When Channel 3 displays KICKDOWN, press the gas pedal to the floor until Channel 4 displays ADP.OK.	04/063		78 to 94%	KICKDOWN	ADP.OK
5. Fuel Tank Leak Test	IDLE	04/071			CHECK END	SYST. OK
6. EVAP System Diagnosis Test	IDLE	04/070	0 to 100%			EVAP OK
7. Closed Loop Fuel Control Test	IDLE	04/107	640–920 RPM	-18 to +18%	-18 to +18%	SYST. OK
8. Heated Oxygen Sensor	IDLE*	04/041	0 to 0.5 kohm	Htg.bC ON	0 to 0.5 kohm	Htg.bC ON
9. Heated Oxygen Sensor		04/042				
10. After CAT Oxygen Sensor Test	IDLE	04/036	0 to 1V	B1-S2 OK	0 to 1V	B2-S2 OK
11. Before CAT Oxygen Sensor Response Time Test	IDLE	04/034	1520–2280 RPM	More than 500°F (260°C)	0.4 to 1.0 s	B1-S1 OK B2-S1 OK
12. Before CAT Oxygen Sensor Response Time Test		04/035				
13. Oxygen Sensor Test	IDLE	04/037	0 to 30%	0 to 1V	-150 to +150 ms	SYST. OK
14. Oxygen Sensor Test		04/038				
* Warm up engine if necessary.						

Table 4-24. Engine Code BEL: 2003 A6 & Allroad 2.7L (sheet 2 of 2)

Diagnostic Test or Check	Test/Check Conditions	Test (04) or Check (08) #	Channel 1	Channel 2	Channel 3	Channel 4
15. After CAT Oxygen Sensor Aging Test 16. After CAT Oxygen Sensor Aging Test	IDLE	04/043 04/044	700–3000 U/min	More than 662°F (350°C)	0 to 1V	B1-S2 OK B2-S2 OK
17. Catalytic Converter Test 18. Catalytic Converter Test	IDLE	04/046 04/047	1880–2280 RPM	More than 599°F (315°C)	0 to 0.80	CAT B1 OK CAT B2 OK
19. Secondary Air System Test (Auto Trans Only) 20. Secondary Air System Test (Auto Trans Only)	IDLE	04/077 04/078	640–920 RPM	0 to 5 g/s	-40 to +10%	SYST. OK
21. Readiness Code Setting Check	IDLE	08/086	00000000			
* Warm up engine if necessary.						

Appendix A: Acronyms

The following acronyms are used in this manual.

A/C	Air Conditioning
AIR	Secondary Air Injection
A/T	Automatic Transmission
CAT	Catalytic Converter
DTC	Diagnostic Trouble Code
ECM	Engine Control Module
ECT	Engine Coolant Temperature
EGR	Exhaust Gas Recirculation
EOT	Engine Operating Temperature
EVAP	Evaporative Emissions
O2	Oxygen
O2S	Oxygen Sensor
OBD	On Board Diagnostic
PNP	Park/Neutral Position
WOT	Wide Open Throttle

Appendix B: Frequently Asked Questions

What is a readiness code?

A VW/Audi readiness code is the equivalent of an OBD-II readiness monitor. The diagnostic tests in the charts are designed to run one of the eight readiness monitors (codes) for specific systems or components. The scan tool has the capability to command the engine control module (ECM) to run diagnostic tests that bypass the normal readiness monitor test-enabling criteria. In most cases, these scan tool-induced monitor tests can be run with the vehicle stationary or while driving the vehicle on a short road test.

Readiness code (monitor) status is now part of some state emission programs. The vehicle will fail if these monitors have not all passed. In addition, repair work can be validated if readiness code tests are run successfully. Any tests that do not pass indicate the vehicle is not operating correctly. Technicians can use these tests as a diagnostic tool to help pinpoint problem areas.

What needs to be done before setting readiness codes?

You must do the following before you can set readiness codes:

- **Check for stored current diagnostic trouble codes (DTCs).** Any codes set will prevent readiness code completion.
- **Repair all DTCs or other known malfunctions.**
- **Make sure the correct engine ID code has been verified on the engine to ensure the correct procedure is selected.** All engine ID codes are stamped on the engine block or on the cylinder head. Some can be found on timing belt cover label, on the sticker in owner's maintenance manual, or on the sticker in spare tire compartment. There may be multiple engine ID codes for the same model and engine.

See the "Operations" chapter of the *Volkswagen/Audi Vehicle Communication User's Manual* for specific engine ID code locations.

How do I check readiness codes?

There are two ways to view readiness codes with the Snap-on® scan tool: through Functional Tests or through Expert Mode. See page 5 for detailed procedures.

How do I know if the test is running or ran correctly?

For most vehicles, if the test ran successfully, the status reading in Channel 4 changes to "ADP.OK" or "SYST.OK". For some, Channel 4 displays "RUN" while the test is running or "ABORT" if the test is interrupted.

For other vehicles, there are eight digits in Channel 4 reading zeros, ones, or Xs. In the chart, usually only one or two of these digits represent the specific test in question. If the test passes, then the correct digits will change from "1" to "0". The other digits represented by X in the chart are not relevant. Always match the scan tool display with the correct channel specification in the chart.

How do I know when to select 04-BASIC SETTINGS or 08-READ MEASURING VALUE BLOCK?

The chart indicates whether the procedure step is a Basic Settings test (04) or a check (08).

If 08 is selected, then no test will run. Instead, data or specifications are viewed in normal operation. *If 04 is selected*, the Basic Settings mode commands the tests to run.

What happens if I accidentally exit out of a test before it is completed?

Depending on the vehicle, re-selecting the test may be sufficient. For others, you may need to go back to the first test, as some require each test to be run in an uninterrupted sequence. For these, be sure not to press **N** at the end of the test. Scroll in the next display group and the scan tool will read and initiate the next test. Vehicles requiring an uninterrupted sequence between specific steps are identified in the charts with a “Do Not Exit” message after the display group number.



NOTE:

The new procedure, starting with some 2002 VW and Audi vehicles, will not allow next step activation without exiting. See “Sample Procedure 2: VW Engine ID Code AWM” on page 13.

Must all readiness code tests be performed sequentially?

No. Many newer vehicles will allow individual tests to be run. However, some may require previous step tests to be completed before they can run. Remember, if DTCs were cleared, all readiness codes will have a Not Ready status. For best results, complete all tests in sequence. Note that any stored code(s) may inhibit tests from running.

Are these the same readiness monitors that I see with my generic OBD-II scan tool?

Yes. The Readiness Code Digit Chart on page 4 displays the same eight readiness monitors as viewed by a generic scan tool. The tests in the charts may have different names and the charts include additional diagnostic tests. Also, note that generic OBD-II scan tools cannot set VW/Audi OBD-II readiness codes; they only report readiness monitor status: Ready (the test passed) or Not Ready (the test has not run or did run and failed).

What do the specifications mean in Channels 1–3?

These are either test specifications that have to be met before the test will run, or they are system or components tested during the readiness monitor test (values may be seen changing during the readiness test). The specifications have various ranges that indicate what values are within tolerance. If the test fails, refer to these specifications to identify the failure area.

Not all vehicles will have specifications in every channel. Some may read a component or system status. If a test fails, go to the corresponding display group for further diagnosis.

Also, be aware that the channel data parameter values displayed are the same in either 04 or 08. The difference is that in 08, the readings are normal operating values, and in 04 the readings may be modified during the test. Specifications refer to range values that must be met either in 04 or 08 as stated in the test procedures.

What should I do if the test will not run?

Be sure to read the instructions because all conditions need to be correct. Also, for some tests, like O2S and Catalytic Converter, the exhaust temperature is very important. When the instructions say to maintain RPM between a certain range, be sure to follow them exactly as some vehicles will abort the test even when only slightly outside of the range. To ensure success, pre-condition the catalytic converter for a few minutes before entering the test. Also, achieving the specified RPM before entering the test may be helpful. If after careful review and several unsuccessful attempts, re-check for DTCs and perform diagnosis of that specific monitor system.

What is the difference between 086 and function 15 for checking readiness codes?

Nothing, both are identical. The 8 digits need to be matched with Table 1-1 on page 4 for the status results of each monitor. Each digit indicates whether a specific monitor has set or completed (i.e., achieved a “Ready” status). A measuring value display for 086 or readiness code (Functional Test) menu selection 15 that reads all eight zeros indicates that all eight monitors have set or completed successfully to a “Ready” status.

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