# Important!

Please give copies to all your Audi Technicians

# Technical Bulletin

| | |
|---|---|
| **Subject:** Malfunction Indicator Light (MIL) ON, DTC P0421 or P0431 Stored in DTC Memory | **Group:** 01<br>**Number:** 03–05 |
| **Model(s):** allroad quattro with 2.7L (Eng. Code APB  2001 and ECM Part No. as listed below) | **Date:** May 5, 2003 |

**Supersedes T.B. Repair group 01 No. 03-03 dated Apr. 17, 2002 due to incorrect date only**

## Condition

ECM requires "Update - Programming" (flashing) to correct:

MIL is ON with Diagnostic Trouble Code (DTC) P0421 "Warm up catalyst, bank 1, efficiency below threshold", or DTC P0431 "Warm up catalyst, bank 2, efficiency below threshold" stored in DTC memory.

The Engine Control Module (ECM) may diagnose the Warm up Catalytic Converter incorrectly under high engine load conditions. The diagnosis threshold has been changed in MY 2002 Engine Control Modules (ECM).

Applies only to 2001 allroad quattro models with ECM Part No: 4Z7 907 551 or Part No: 4Z7  907 551K.

## Service

> *CAUTION!*
>
> *The following "Update - Programming" (flashing) process may overwrite any "TUNED" ECM programming.*
>
> *A "TUNED" ECM is described as any ECM altered so as to perform outside the normal parameters and specifications approved by Audi of America, Inc..*

If you encounter a vehicle with a "Tuned" ECM, prior to performing the "Update - Programming" (flashing) procedure:

- Your Dealership should place the vehicle owner on notice in writing, that their ECM was found to have been tuned, and that any damage caused by the tuning of the ECM (including any adverse emissions consequences) will not be covered by Audi of America, Inc. warranties.

- For any repair requested by the owner under warranty or outside warranty that requires flashing, which will automatically wipe out the "Tuning" program, your Dealership should advise the owner of the above and get his written consent (see attached Control Module Tuning form) to the flashing procedure.

**Tool requirements**

◆ VAS 5051 or VAS 5052 with Basis CD A.05.15 and the Brand CD A.05.0 (or later).

◆ "Update - Programming" (flashing) CD "KM01" (indicated on CD).

Additional copies of "Update - Programming" (flashing) CD (Item no: A0050012588) may be ordered from the Audi Technical Literature Ordering Center at audi.ddsltd.com, or by calling 1-800-544-8021 from 8:00 a.m. to 8:00 p.m. EST Monday through Friday. This number can be dialed in both the United States and Canada.

**Vehicle requirements**

◆ Battery MUST have minimum no-load charge of 12.5V (failure to maintain voltage during update process can lead to ECM failure)

◆ VAS 5051: connected to vehicle (using K-lead adapter VAS6017A) and to 110V AC Power supply at all times during procedure

◆ VAS 5052: connected to vehicle (using K-lead adapter VAS6017A) with battery voltage requirements met

◆ Any appliances with high electromagnetic radiation (i.e. mobile phones) switched OFF.

◆ No stored DTCs, print and erase any stored DTCs.

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*CAUTION!*

*Non–observance of the following points may lead to ECM failure!*

*VAS 5051 or 5052 must always be connected to the approved power supply at the approved voltages. Under no circumstances should the power supply be interrupted or the diagnostic connector unplugged during the flash procedure.*

*Any appliances with high electromagnetic radiation (i.e. mobile phones) must be switched OFF.*

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![Audi rings logo] **Important!**
Please give copies to
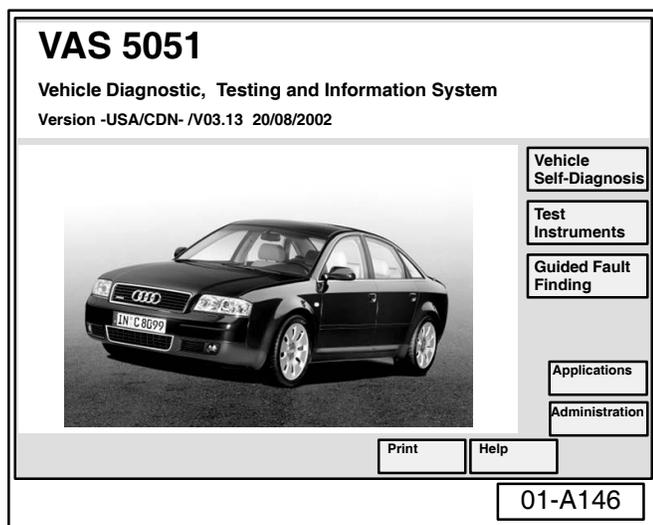all your Audi Technicians

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**PRIOR to performing procedure to "Update - Programming" (flash) the ECM:**

◆ ALL fault memories must be interrogated and erased.

– Switch ignition ON.

– Select Vehicle "Self Diagnosis mode".

– Select Diagnosis function 00 "Collection services".

– Select "Check DTC memory - complete system" which will interrogate all fault memories.

– Print all DTCs.

– Erase ALL fault memories.

Once ALL fault memories have been erased:

"Update - Programming" CD must be used to place the tester into the flashing mode (see "'VAS 5051 / VAS 5052, programming for flashing mode" below).

– Update Programming (reflash) the Engine Control Module (ECM). Do not replace catalytic converter.

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## VAS 5051

**Vehicle Diagnostic, Testing and Information System**
Version -USA/CDN- /V03.13  20/08/2002

| Vehicle Self-Diagnosis |
| Test Instruments |
| Guided Fault Finding |

| Applications |
| Administration |

| Print | Help |

01-A146

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**VAS 5051 / VAS 5052, programming for flashing mode**

– Switch ignition ON.

– Switch VAS 5051/5052 ON and insert flash CD into CD drive as soon as start screen appears.

– Select "Applications".
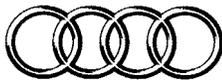
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| Applications | |
|---|---|
| **Application selected** | |

**AESIS**
**Start application from CD-ROM** ◀
**Service Traning**

| | Go to | Print | Help |
|---|---|---|---|
| ◀ | | | |

01-A155

◀ – Select "Start application of CD ROM" (arrow).

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**You have now prepared yourVAS 5051 for a special Update programming session applies only to 2002 allroad quattro with ECM Part No:4Z7 907 551 or 4Z7 907 551K**

**Please follow these steps**

- Select "Back"

- Select "Vehicle  Self Diagnosis

- Select "01 - Engine electronics

- Select "Forward to get to the screen with ECM options

- Select "Update - Programming"

**After you have finished the programming session it is absolutely necessary to run this program again to change your VAS 5051 into normal diagnostic condition!**

| OK |
|---|

01- A154

◀ The VAS 5051/VAS 5052 is now ready to "Update - Programming" (flash) the ECM.

– Select "OK".
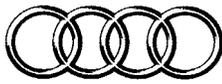
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## "Update - Programming" (flashing) procedure, checking for update match

– On the Applications screen, select the ◀ button, to return to start screen.

– Select "Vehicle Self Diagnosis" mode.

– Select vehicle system "01-Engine electronics".

– Select the "Print", then "Screen" button.

– Select the ▶ button.

◆ "Update - Programming" (arrow) will appear.

### Note:

*The "Update - Programming" function is only available when the inserted flash CD level and current vehicle ECM level are different.*

◀ – Select "Update - Programming" option at bottom of screen (arrow).

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**Vehicle Self-Diagnosis**

| | 01 - Engine electronics |
|---|---|
| **Select** | ECM Part Number |
| | ECM description & software level |
| **diagnosis function** | Coding XXXXX |
| | Dealership number XXXXX |

02 - Interrogate fault memory
03 - Final control diagnosis
04 - Basic settings
05 - Erase fault memory
06 - End output
07 - Code control unit
08 - Read data block
09 - Reading individual measuring value
10 - Adaption
11 - Log-in procedure
Update - Programming ⬅

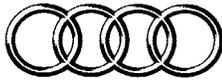| ◀ | Test Instruments | | Go to | Print | Help |

01-A133

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### CAUTION!

*Once "Update - Programming" function has been started, switching ignition OFF or disconnecting the diagnostic connector may completely destroy the ECM.*

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**Vehicle Self-Diagnosis**
**Update - Programming**

| | 01 - Engine electronics |
|---|---|
| | ECM Part Number |
| | ECM description & software level |
| | Coding XXXXX |
| **Programming can be carried out.** | Dealership number XXXXX |

**WARNING!**
The programme version stored in the control unit will be erased
It will be programmed with the new version 000X
The erasing programming process will last roughly XX minutes
The part number in the control unit identification may change.
Vehicle specific data (coding, adaptation etc.) might be lost. It must be checked after successful programming
After the continue button has been pressed the process cannot be cancelled.
**IMPORTANT -- PLEASE NOTE:**
Switching ignition off or disconnecting the diagnostic connector during programming may completely destroy the control module!

| ◀ | Test Instruments | | Go to | Print | Help | ▶ |

01-A158

## "Update - Programming" (flashing), performing

After selecting "Update - Programming" function:

◀ ◆ New program version and approximate timing for update is shown on the VAS 5051/5052 screen.

– By selecting the ▶ button, the programming procedure begins.

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| Vehicle Self-Diagnosis | 01 - Engine electronics |
|---|---|
| Update - Programming | ECM Part Number |
| Programming in progress | ECM description & software level |
| | Coding XXXXX |
| | Dealership number XXXXX |

Data Transfer  in %

0    11                                      100

01-A137

◀ Similar screen appears.

   ◆ The previous data in the ECM is erased and the new data is being transferred to the module from the flash CD.

**Note:**

*Approx. flash time is 17-19 minutes.*

| Vehicle Self-Diagnosis | 01 - Engine electronics |
|---|---|
| Update - Programming | ECM Part Number |
| Programming in progress | ECM description & software level |
| | Coding XXXXX |
| | Dealership number XXXXX |

Data Transferred  in %

**Diagnosis bus faulty**

**No voltage or voltage too low on diagnostic bus**

0                                                 100

**Is the battery voltage from the vehicle too low?**
**Is the diagnostic connector connected to the vehicle?**

Repeat                                  Cancel

01-A138

**NOTE:**

◀ *If, during the "Update - Programming", a fault message is displayed:*

   – Confirm that VAS 5051 or VAS 5052 diagnostic tool power supply is adequate and that ALL appliances with high electromagnetic radiation (i.e. mobile phones) are switched OFF.

   – The "Update - Programming" (flashing) process must then be started from the beginning using the "Repeat" button (arrow). DO NOT use the "Cancel" button.

**Important!**

On NO occasion should the "Cancel" button be selected or the ignition switched OFF.
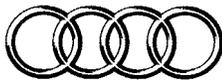
| Vehicle Self-Diagnosis | 01 - Engine electronics |
|---|---|
| Update - Programming | ECM Part Number |
| Programming  log | ECM description & software level |
| Save result? | 000X |
| | Dealership number XXXXX |

| Expanded identification old | Expanded identification new |
|---|---|
| XXXXXXXXXX | XXXXXXXXXX |
| Description and software level | 000X |
| Coding xxxxx | |
| Dealership number    xxxxx | Dealership number    xxxxx |
| Unit number 942 | Unit number 0 |
| Importer number 444 | |
| Programming status | |
| Status | No malfunction |
| Counter programming status | 1 |
| Counter successful attempts | 1 |
| Programming pre-condition | fulfilled |

| ◄ | Test Instruments | | Go to | Print | Help | | ► |

01-A144

Once "Update Programming" (flashing) is complete:

◄ ◆ Similar screen appears.

◆ Old ECM Part No. and software level are still displayed at (arrows).

***Note:***

*New ECM Part No. and software level are not displayed until process is complete and fault memories have been erased.*

– Select the "Print", then "Screen" button.

◆ VAS 5051 will print to printer immediately.

◆ VAS 5052 will hold the print until process is complete and then you may take the tester to the printer for printing the screen.

– Attach print to vehicle Repair Order.

Once "Update - Programming" (flashing) is complete, the control module must be re-initialized.

– Select the ► button.

| Vehicle Self-Diagnosis | 01 - Engine electronics |
|---|---|
| Update - Programming | ECM Part Number |
| | ECM description & software level |

**To continue, the control unit requires an ignition off/on cycle**

01-A140

◄ ◆ The tester requests you to switch the ignition OFF.
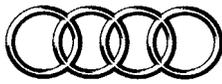
– Switch ignition OFF.

**IMPORTANT!**

◆ Wait at least 20 seconds before switching the ignition back ON (failure to wait at least 20 seconds may damage the ECM)

After waiting 20 seconds:

– Switch ignition ON.

After switching ignition ON, the ECM has been re-initialized, however, fault memories must be now be erased.

– Select the "Continue" button.

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| Vehicle Self-Diagnosis | 01 - Engine electronics |
|---|---|
| Update - Programming | ECM Part Number |
| | ECM description & software level |
| Erase fault memory | Coding XXXXX |
| | Dealership number XXXXX |

The programming causes fault records in related control units. The fault memories of all control units in the vehicle must be erased.

Pressing the Continue button will automatically erase the fault memories.

Pressing the Back button will not erase fault memories

| ◄ | Test Instruments | | Go to | Print | Help | | ► |

01-A141

## Fault memories, erasing after "Update - Programming" (flashing)

Due to the CAN bus system, fault messages will be stored in various Control Modules during programming.

◄ – To erase ALL fault memories, confirm by selecting the ► button.

***Note:***

*Erase fault memories takes approx. 15 minutes.*

Once fault memories have been erased:

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| Vehicle Self-Diagnosis | 01 - Engine electronics |
|---|---|
| Update Programming | ECM Part Number ◄ |
| DTC memories are erased | ECM description & software level ◄ |
| Function ended | Coding XXXXXX |
| | Dealership number XXXXX |

Vehicle systems with erased fault memories:
01 - Engine electronics
02 - Gearbox electronics
03 - Brake electronics
15 - Airbag
25 - Immobilizer
16 - Steering wheel electronics
46 - Convenience system central module
56 - Radio
17 - Dash panel insert

Function ended!

| ◄ | Test Instruments | | Go to | Print | Help |

01-A145

◄ ◆ Similar screen appears.

◆ Old ECM Part No. and update version of software level still appear at (arrows).
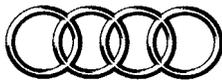
◆ Function ended appears at bottom of screen.

Finish update of ECM by selecting the ◄ button.

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| Vehicle Self-Diagnosis | 01 - Engine electronics |
|---|---|
| | ECM Part Number |
| Vehicle system with a | ECM description & software level |
| number of control units | Coding XXXXX |
| | Dealership number XXXXX |

XXXXXXXXXXXX
XXXXX   XXXXXXXXXXXXXX

| Test Instruments | | Go to | Print | Help | | ► |

01-A159

◄ ◆ Similar screen appears.

◆ New ECM Part No. 4Z7 907 551M will appear.

◆ Udate version software will appear.

– Print the ECM screen to verify ECM update software level.

VAS 5051 / VAS 5052 MUST now be returned to "Normal" operating mode as follows:
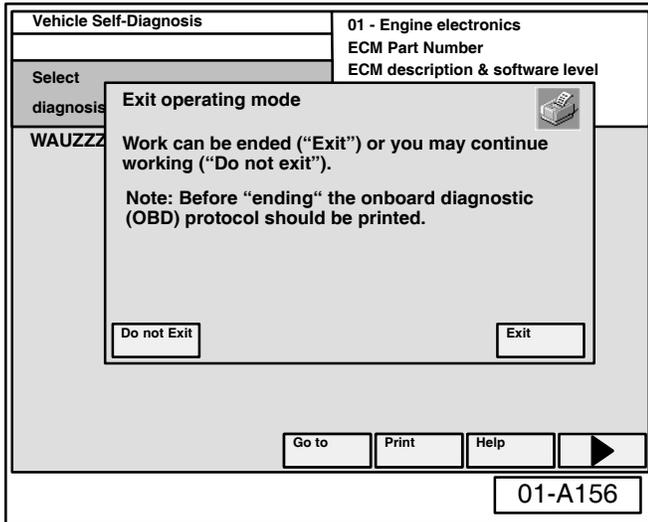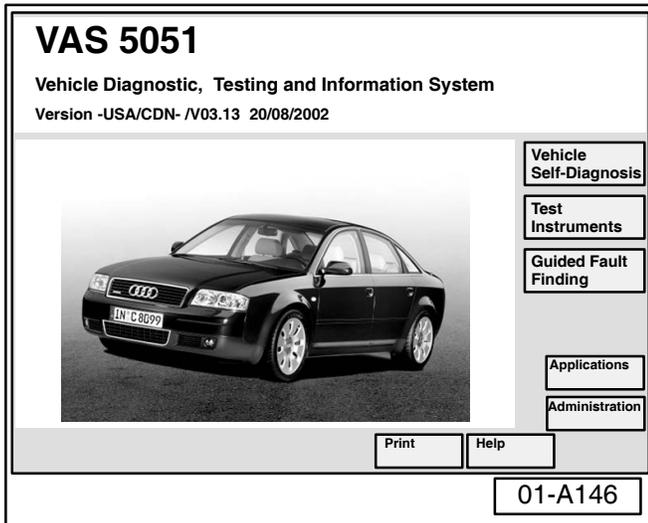
– Select "Go to" then "Exit".

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**C 01–03–05**

| Vehicle Self-Diagnosis | 01 - Engine electronics |
| --- | --- |
| | ECM Part Number |
| Select | ECM description & software level |
| diagnosis | |
| WAUZZZ | |

**Exit operating mode**

Work can be ended ("Exit") or you may continue working ("Do not exit").

Note: Before "ending" the onboard diagnostic (OBD) protocol should be printed.

| Do not Exit | | Exit |
| --- | --- | --- |

| Go to | Print | Help | ▶ |
| --- | --- | --- | --- |

01-A156

◀ ◆ Similar screen appears.

– Select "exit".

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**VAS 5051**

**Vehicle Diagnostic, Testing and Information System**

Version -USA/CDN- /V03.13  20/08/2002

| Vehicle Self-Diagnosis |
| --- |
| Test Instruments |
| Guided Fault Finding |
| Applications |
| Administration |

| Print | Help |
| --- | --- |

01-A146

**VAS 5051 / VAS 5052, returning to normal operation mode**

◀ From the VAS 5051/5052 start screen:

– Select "Applications".
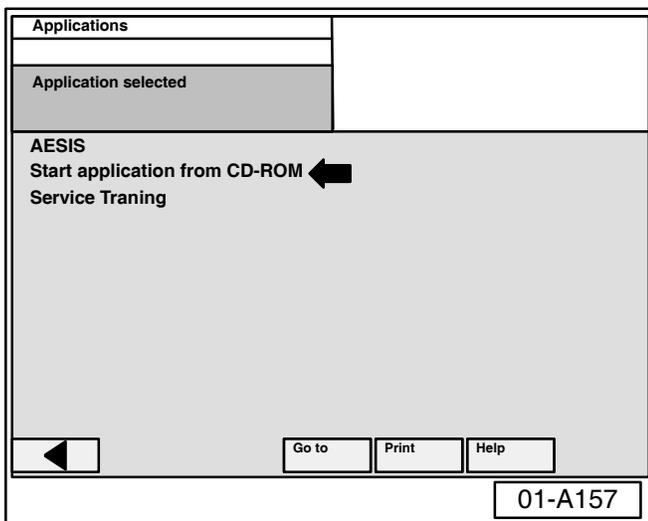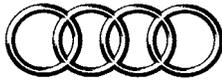
---

| Applications | |
| --- | --- |
| Application selected | |

AESIS
**Start application from CD-ROM** ⬅
Service Traning

| ◀ | Go to | Print | Help |
| --- | --- | --- | --- |

01-A157

◀ – Select "Start application of CD ROM" (arrow).

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![Audi rings logo] **Important!**
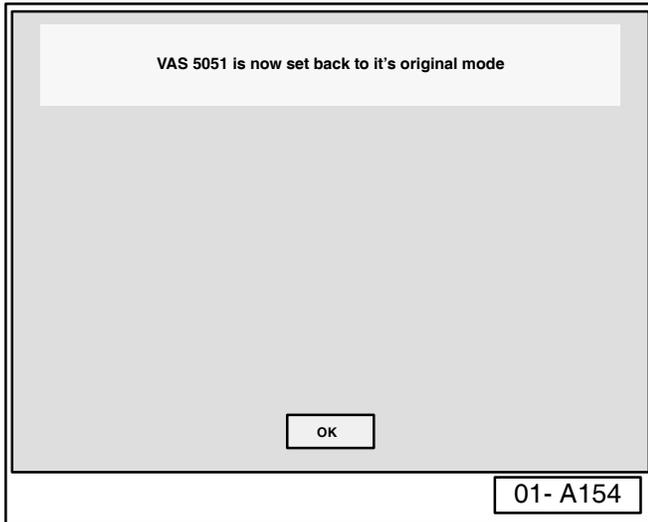Please give copies to
all your Audi Technicians

# Technical Bulletin

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VAS 5051 is now set back to it's original mode
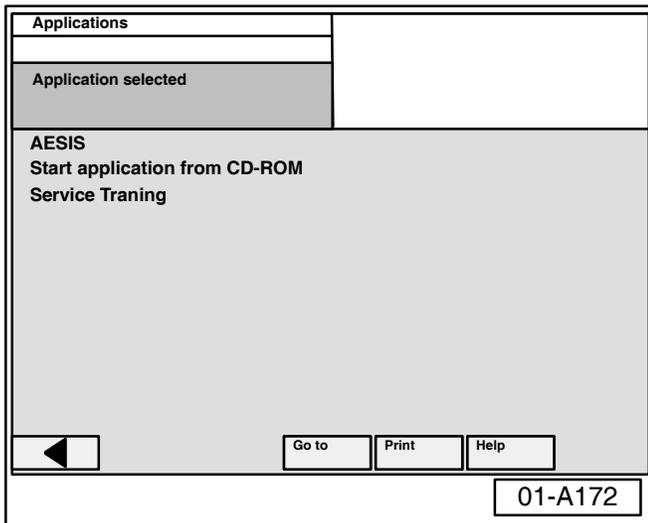
OK

01- A154

◄ The VAS 5051/VAS 5052 is now set back to it's "original mode".

– Select "OK".

***Note:***

*If this step is not completed the VAS 5051/VAS 5052 will NOT be capable of performing any diagnostic functions!*

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Applications

Application selected

AESIS
Start application from CD-ROM
Service Traning

◄          Go to    Print    Help

01-A172

◄ – On the Applications screen, select the ◄ button, to return to start screen.

◆ ECM reprogramming is complete.

***Note:***

*It is not generally necessary to encode the ECM following the "update - Programming" (flashing procedure. However, you must set the readiness code.*
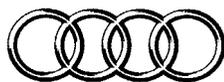
To set readiness code:

● Use VAS 5051 or VAS 5052 and Self Diagnosis, along with the attached Quick Reference "How to set Readiness Code".

With readiness code set:

– Remove CD and disconnect VAS 5051 / VAS 5052 from vehicle.

For Warranty information see Page 12.

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# Technical Bulletin

| | |
|---|---|
| **When procedure applies to vehicles within the New Vehicle Limited Warranty:** | |
| **Claim Type:** | **W2** |
| **\* Damage Code:** | **2470 39 xxx1** |
| **Due to the varying complexity of tester software and vehicle systems checked by the tester, actual time may vary, therefore A-Time must be used.** | |
| **Labor Operation:**<br><br>**Includes all operations necessary to complete repair.** | **24709999**<br><br>**Maximum A-Time allowed 130 TU** |
| **Claim Comment: Type "As Per Technical Bulletin A010303" in comment section of Warranty claim.** | |

*\*) xxx = Vendor code for part*

## OWNER INFORMATION ABOUT CONTROL MODULE TUNING* AND AUTHORIZATION FOR REPROGRAMMING (REFLASHING) OF CONTROL MODULES(S)
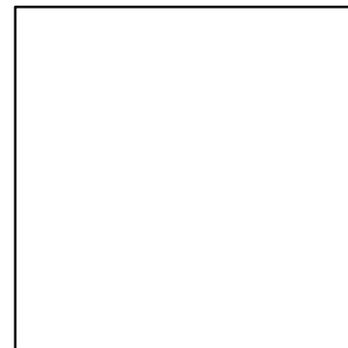
*) *"TUNING" is described as the addition of or modification of any component which causes an Audi vehicle to perform outside the normal parameters and specifications approved by Audi of America, Inc..*

Date: _____

Dealer Number: _____

Vehicle Identification Number: _____

Repair Order Number: _____

**Dealer stamp**

I _____ , owner or driver of the above identified Audi, confirm:

❑  "Tuning" as described above (especially power increasing modifications) has NOT been performed on my vehicle.

❑  "Tuning" as described above has been performed on my vehicle and the following components were modified or installed:

_____

TUNING was performed by (Please provide Company name and telephone number, if you wish us to contact them): _____

I understand that if my Control Module is determined to have been tuned, any damage caused by the tuning of the Control Module (including adverse emissions consequences) will not be covered by Audi of America, Inc. warranties.

I am requesting that my Dealer reflash (update) my Control Module, and understand that this process will automatically (overwrite) and permanently wipe out any "Tuning" program which was previously performed on the Control Module.

I have read this statement and confirm my request by affixing my signature immediately below.

_____
Signature of Customer

# Quick Reference: How to set Readiness Code
## S4/A6/Allroad 2.7T BiT, engine code APB, MY 2000-2002 TLEV

| Step | Procedure VAS 5051/ 5052 Diagnostic Status | Engine Condition | Function/ Display-Group | Channel 1 | Channel 2 | Channel 3 | Channel 4 |
|---|---|---|---|---|---|---|---|
| 1 2 | Check DTC Memory Clear DTC Memory | Engine OFF Ignition ON | 02 05 | - | - | - | - |
| 3 | Adaptation Throttle Valve Control Module | Engine OFF Ignition ON | 04/060 | 3% - 20% | 80 - 97% | 8 | ADP.OK |
| 4 | Adaptation Kick Down (Only with Automatic Transmission) | Engine OFF Ignition ON Press gas pedal to the floor | 04/063 | - | 78 - 94% | Kick Down | ADP.OK |
| 5 | Fuel System Leakage Check | Engine ON @ Idle | 04/071 | - | - | Check END | Syst. OK |
| 6 | EVAP Canister Purge Regulator Valve Check | Engine ON @ Idle | 04/070 | 0% - 100 % | - | - | EVAP OK |
| 7 | Lambda Control | Engine ON @ Idle | 04/107 | 640 – 920 RPM | -18 - +18% | -18 - +18% | Syst. OK |
| 8 9 | Heated Oxygen Sensor | Engine ON 1800 - 2200/min* | 04/041 04/042 | 0 - 0.5 kOhm | Htg.bC ON | 0 - 0.5 kOhm | Htg.aC ON |
| 10 | Operational Readiness of Oxygen Sen. behind Cat. Conv. | Engine ON @ Idle | 04/036 | 0–1V | B1-S2 OK | 0–1V | B2-S2 OK |
| 11 12 | Response Time Front Heated Oxygen Sensor | Engine ON 1520 - 2280/min** | 04/034 04/035 | 1520 - 2280 RPM** | more than 260°C | 0,4 - 1,0 s | B1-S1 OK B2-S1 OK |
| 13 14 | Oxygen Sensor Control System | Engine ON @ Idle | 04/037 04/038 | 0 - 30 % | 0 - 1 V | -150 - +150 ms | Syst. OK |
| 15 16 | Oxygen Sensor aging behind Cat. Conv. | Engine ON @ Idle | 04/043 04/044 | 700 – 3000 U/min | more than 350°C | 0 – 1 V | B1-S2 OK B2-S2 OK |
| 17 18 | Three Way Catalytic Converter | Engine ON 1880 - 2280/min** | 04/046 04/047 | 1880 - 2280 RPM** | more than 315°C | 0 – 0.80 | CAT B1 OK CAT B2 OK |
| 19 20 | Secondary Air System Only AT vehicles | Engine ON @ Idle | 04/077 04/078 | 640 – 920 RPM | 0 – 5 g/s | -40 - +10 % | Syst. OK |
| 21 | Check Readiness Code Setting | Engine ON @ Idle | 08/086 | 00000000 | 00000000 | 00000000 | 00000000 |

Requirement: Coolant Temperature more than 80°C

\* to warm up engine if necessary, test is complete when values are present in channel 1 and 3      \*\* only during Diagnostic Performance

**For more details, refer to Repair Manual "Readiness Code, generating". Confirm Readiness Code generating with a VAS 5051 Printout!**