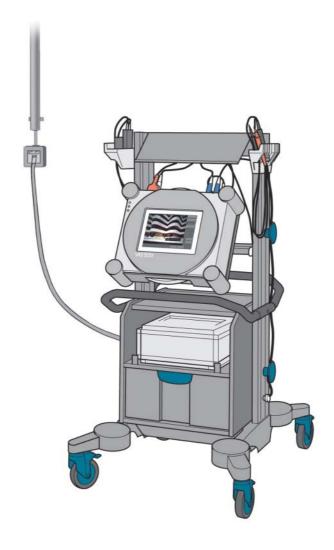
Service.





VAS 5051 on-line link

Self Study Programme 294



To date, the diagnosis system VAS 5051 only permitted communication with the vehicle. The on-line link extends the potential offered by the tester.

To coincide with the market launch of the Audi A8 '03, two on-line functions are available for the diagnosis tester.

Firstly, telediagnosis which permits remote control of the tester from another location.

Secondly, the diagnosis tester link to a central data base.

Fully automatic adaption of the immobilizer components is effected by means of direct communication between data base and tester.

This facilitates the procedure when replacing such components in the vehicle and also further enhances system reliability.

## **Contents**

| Page   | е   |
|--|---|
| Prerequisites         Diagnosis tester link to PC network  |   |
| Telediagnosis What is the purpose of telediagnosis?  |   |
| ImmobilizerWhat is immobilizer 4?8Central data base FAZIT8Access requirements for mechanics9Mandatory entries9New features of immobilizer 410System components11Immobilizer control unit12Engine control unit12Vehicle key12Entry and start authorisation switch -E41513Steering column lock control element -N36013Other components13Re-adaption following immobilizer control unit theft14Key programming at the factory14Adaption for immobilizer 415Adaption for immobilizers 1 to 315Menues for immobilizers 1 to 315 | 3<br>9<br>9<br>1<br>1<br>1<br>1<br>5<br>5 |
| Radio Code Radio code enquiry (not for A8 '03)   | ;   |
| Component ProtectionWhat is meant by component protection?.18Component protection function.18Adaption of new control unit.19   | 3   |
| Service Component protection diagnosis   | )   |

<u></u> =











The Self Study Programme contains information on design features and functions.

The Self Study Programme is not intended as a Workshop Manual.

Values given are only intended to help explain the subject matter and relate to the software version applicable when the SSP was compiled.

Attention Note

New



# **Prerequisites**



### Diagnosis tester link to PC network

For implementation of on-line functions with the diagnosis tester, a tester upgrade kit VAS 5051/45 is now available.

This is an Ethernet PC card specially tailored to the requirements of the tester and includes the necessary accessories. Upgrading the tester with this card enables it to be linked to the dealer's PC network.

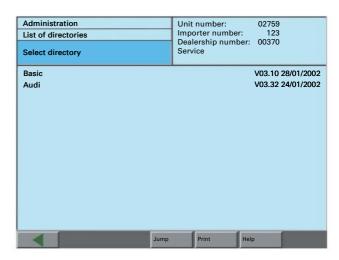


294 002

### Software required

Telediagnosis is integrated into the basic software as of version 03.10.

The immobilizer 4 and component protection functions (refer to Pages 18 and 19) require basic software as of version 4.0.



294\_003

|  | No | tes |  |
|--|----|-----|--|
|  |    |     |  |
|  |    |     |  |

# Telediagnosis

## What is the purpose of telediagnosis?



To date, product consultants could only provide support for workshops by way of telephone and telefax.

Telediagnosis enables product consultants to observe and control the tester screen information alongside the mechanic in the workshop.



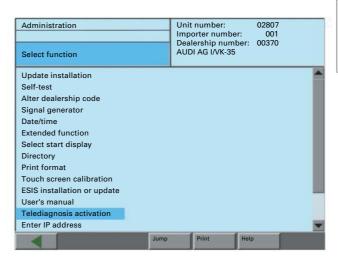
#### **Activating telediagnosis**

If telephone assistance proves not to be adequate to solve a particular problem, the product consultant can decide to activate telediagnosis. Data are transferred by way of the Ethernet link.

All the screen information from the workshop unit is available on the product consultant's PC. The unit can be operated either by the mechanic in the workshop or from the product consultant's workplace. Instructions, for example concerning the connection of test cables or the implementation of functions on the vehicle, can be given by way of the parallel telephone link.

To be able to establish the link, the product consultant must be aware of which diagnosis tester has been activated for telediagnosis.

This involves informing the product consultant of the computer name in the network. If the product consultant is only informed of the dealership number from the "Administration" menu, it will not be possible to clearly identify the diagnosis tester as there may be several dealership testers available for selection on the product consultant's PC.







#### What is immobilizer 4?

Immobilizer 4 is not a control unit but rather a function.

This includes:



- Storage of all theft-specific control unit features in a central data base
- Immobilizer control unit communication with the other components involved
- Encoding procedures for data communication between the components involved

#### Central data base FAZIT

An essential immobilizer 4 component is the central data base FAZIT at Audi in Ingolstadt. **FAZIT** in German stands for **V**ehicle **i**nformation and **c**entral **i**dentification **t**ool. This data base contains all the theft-specific data of the control units integrated into the "Immobilizer" and "Component protection" functions.

The control units involved cannot be adapted without an on-line link to FAZIT.



### Access requirements for mechanics

All users of the **GeKo** system (standing for **se**curity and **co**mponent protection) with the tester functions "Immobilizer adaption", "Radio code enquiry" and "Component protection" must be individually registered in the dealership user administration system. The registration procedure includes the release form, which is sent to the importer or regional sales centre as confirmation. Following access authorisation, the mechanic receives a personal user ID and password.

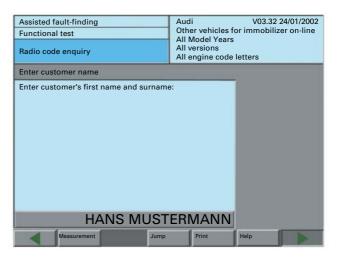


294\_008

### **Mandatory entries**

The following entries always have to be made on accessing FAZIT:

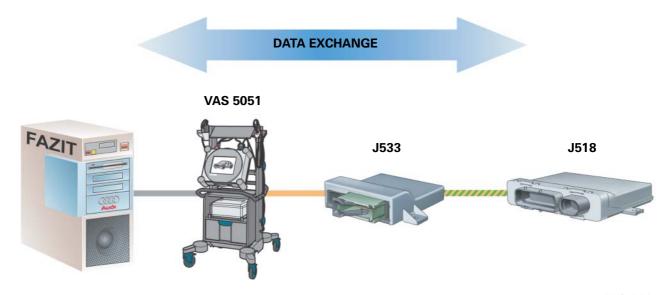
- Vehicle chassis number
- Name of customer
- Number of customer's identity document
- Customer's nationality
- Mechanic's user ID
- Mechanic's password



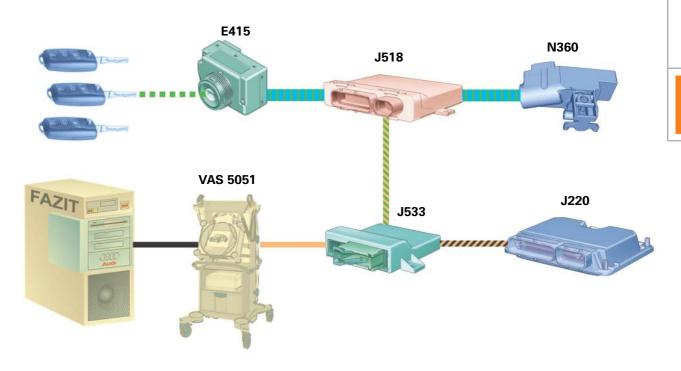


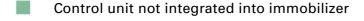
#### New features of immobilizer 4

- On-line enquiry by the diagnosis tester is the only way of ensuring safe, rapid and reliable data transfer to the vehicle. Immobilizer component PIN enquiries by fax and provisional component release are not possible.
- All components involved with the immobilizer must be adapted on-line.
- All vehicle keys including re-orders are pre-encoded at the factory for a particular vehicle and can only be matched to this vehicle.



### System components





Control unit integrated into immobilizer

Master control unit

PC/mainframe

|   | Wireless data transfer      | E415 | Entry and start authorisation switch |
|---|-----------------------------|------|--------------------------------------|
|   | Bidirectional data transfer | J518 | Entry and start authorisation        |
|   | Convenience CAN             | 33.3 | control unit                         |
| _ | Diagnosis CAN               | N360 | Steering column lock control element |
|   | Drive system CAN            |      |                                      |
|   | PC network                  | J533 | Data bus diagnostic interface        |
|   | . 55                        | J220 | Motronic control unit                |

294\_011



This Self Study Programme only describes the component features of relevance to the "Immobilizer" function in the AUDI A8 '03.

A general functional description can be found in the Self Study Programme 287 "AUDI A8 '03 - Electrical Components".

#### Immobilizer control unit

To date, vehicles were either fitted with separate immobilizer control units or the control system was integrated into the dash panel insert. Both are possible with immobilizer 4.

In the Audi A8 '03, the immobilizer is integrated into the entry and start authorisation control unit -J518. On this vehicle, the dash panel insert is not part of the immobilizer, but does form part of the component protection system (refer to Pages 18 and 19).

On-line adaption is the only means of releasing the control unit.



294\_012

#### **Engine control unit**

All engine control units form part of the immobilizer and their release involves on-line adaption.



294\_013

### Vehicle key

The key has a mechanically encoded hinged bit, used exclusively for the functions in the lock cylinders (driver's door, tailgate/boot lid). The transponder function is an integral part of the electronics and can be used even without battery voltage in the key. The keys for the Advanced Key function additionally contain electronics for wireless bidirectional communication with the entry and start authorisation control unit.

Up to 8 keys can be matched to the system.

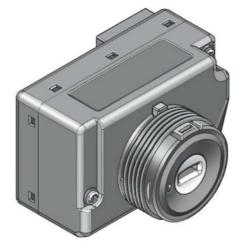
The vehicle keys for immobilizer 4 vehicles are mechanically and electronically preencoded at the factory for the corresponding vehicle, i.e. the internal profile of the key is milled and basic encoding performed so that the key can only be matched to the vehicle for which it was ordered.



#### Entry and start authorisation switch -E415

The Audi A8 '03 does not feature a conventional ignition/starter switch. The entry and start authorisation switch does not evaluate the mechanical encoding of the key. An integral feature of the key is the reader coil which transmits the transponder data of the ignition key in encoded form via a bidirectional data wire to the entry and start authorisation control unit.

The entry and start authorisation switch does not have to be matched to the immobilizer system.



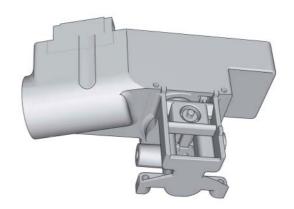




#### Steering column lock control element -N360

The steering column lock control element - N360 is actuated by the entry and start authorisation control unit. It locks and releases the steering column. Encoded data transfer between -J518 and -N360 only takes place at term. 15.

The steering column lock control element forms part of the immobilizer and has to be adapted to the system following replacement.



294\_016

### Other components

None of the other electronic components, such as door handles, aerials and start/stop buttons feature microcontroller actuation and they are not integrated into the "Immobilizer" and "Component protection" security systems.

### Re-adaption following immobilizer control unit theft

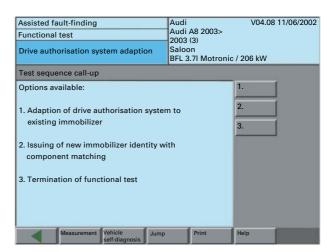
The "New identity" menu provides all control units integrated into immobilizer 4 with new basic encoding.

The central data base FAZIT is informed of the new basic encoding.

If the engine control unit, for example, has been stolen, it is not necessary to replace all control units integrated into the immobilizer.

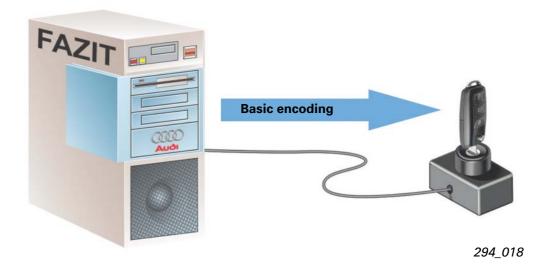
The "New identity" menu is integrated into the assisted fault-finding routine under entry and start authorisation control unit.

After re-encoding, any vehicle keys which were still functional and the steering column lock control element can no longer be used.



294\_017

#### Key programming at the factory





Re-ordered keys are provided with their basic encoding from the FAZIT data base. If a vehicle has been given a "new identity",

- "new identity" must be quoted on ordering the keys or
- the keys are not to be ordered until the "new identity" has been issued.

#### Adaption for immobilizer 4

All immobilizer adaption function menues are implemented as part of "Assisted fault-finding" mode and are menu-driven. The functions are vehicle-specific. Use can therefore not be made of the "Other vehicles" option (see below).

The engine cannot be started for 5 minutes if one or more of the following components has/have been adapted:

- Steering column lock control element
- Entry and start authorisation control unit
- Key set with new first key

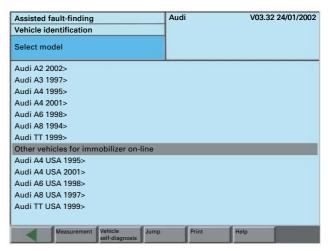
The disable time can be read out in the entry and start authorisation control unit as measured value block.





#### Adaption for immobilizers 1 to 3

All vehicles which cannot be specifically selected are covered by the "Other vehicles for immobilizer on-line" menu item. For "Other vehicles", the vehicle system test is restricted to immobilizer-specific systems. Other control units are not interrogated.



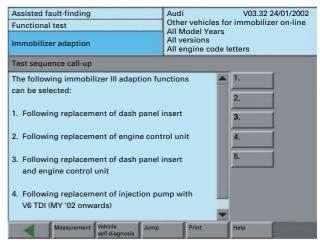
294\_020

#### Menues for immobilizers 1 to 3

The adaption of all components of immobilizer generations 1 to 3 is menudriven.

For older immobilizer systems, it may be necessary to manually enter the chassis number via an input mask.

As with immobilizer 4, all adaption operations require FAZIT data base login with personal user ID and password.





# Radio Code

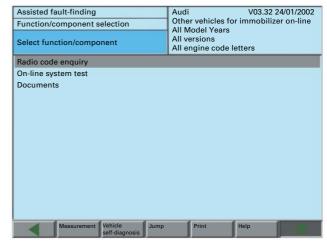
#### Radio code enquiry (not for A8 '03)

The on-line link also permits call-up of the 4-position radio codes. These are indicated on the tester display and have to be entered in the usual manner via the radio buttons for radio release.

The diagnosis tester does not have to be connected to a vehicle for implementing the menu item "Radio code enquiry".

Selecting "Other vehicles for immobilizer online" avoids a complete vehicle system test which would involve connecting the vehicle to the tester.

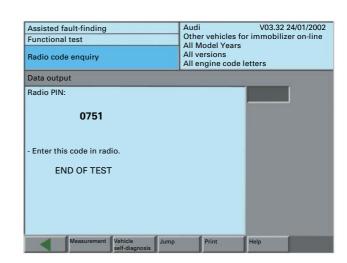
Once the vehicle has been selected and the immobilizer system automatically recognised, the "Radio code enquiry" menu can be called up under "Function/component selection".



294\_022

In addition to the general mandatory entries such as chassis number, user ID and password, the serial number of the radio is also requested for radio code enquiry.

The procedure is logged in the FAZIT data base via the on-line link and the radio code then displayed on the diagnosis tester.



294 023

|  | No | tes |  |
|--|----|-----|--|
|  |    |     |  |
|  |    |     |  |

# **Component Protection**

#### What is meant by component protection?

Component protection is an electronic safeguard for control units designed to prevent their use in other vehicles if stolen.

The control units integrated into the component protection system are mainly from the infotainment and convenience sectors.

In multimedia components in the Audi A8 '03, the "Component protection" function replaces the 4-position radio code.



#### Component protection function

Control units with component protection function are encoded for a specific vehicle.

Functions will be restricted if a control unit has not been adapted to the vehicle. A message is displayed in the dash panel insert and front information display unit when component protection is active.

In addition, a fault memory entry will be stored in the non-adapted control unit.

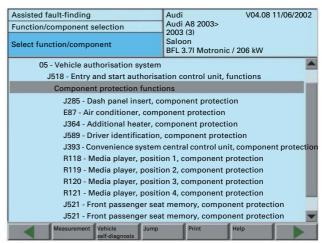


294 031

### Adaption of new control unit

If control units with component protection function are installed in a vehicle or even just swapped between 2 vehicles on a trial basis, the control units concerned must be adapted to the appropriate vehicle.

The adaption process is similar to that for a control unit integrated into the immobilizer. Here again the diagnosis tester requires an on-line link and the mechanic concerned needs password access to the FAZIT data base at Audi.







### Component protection diagnosis

The following entries are stored in the fault memory for a control unit with active component protection:

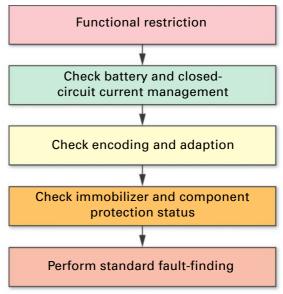
| Fault location  | Type of fault         | Background  |
|---|-----------------------|---|
| Component protection active                             |                       | Fault is always output as being "static" when functions are restricted.  Fault status switches from "static" to "sporadic" if functional restrictions are cancelled again within a terminal 15 cycle.  Fault is erased automatically following implementation of a valid adaption procedure for learning new vehicle data.  |
| Immobilizer<br>control unit                             | No commu-<br>nication | Corresponding bus error is entered in the event of communication problems on data wires.  |
| protection incorrect new basic setting/ me adaption imp |                       | This fault is entered as long as control unit still has "brand new" status. Fault cannot be cancelled via "Erase fault memory". Fault is erased automatically following implementation of a valid adaption procedure for learning new vehicle data.  Fault does not then become "sporadic", but rather is removed directly. |

294\_033

### Fault-finding strategy

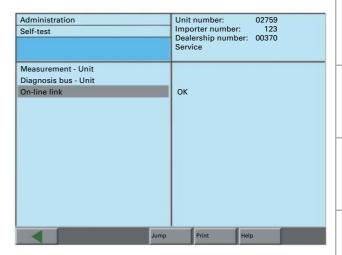
The new component protection and battery management features in the vehicle may influence component functions.

This gives rise to an extended fault-finding concept in which components are first to be checked for routine functional restrictions before commencing standard fault-finding.



### Checking on-line link

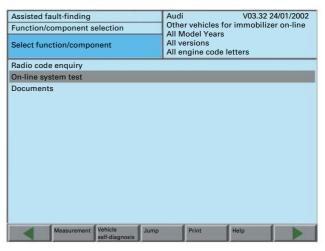
An on-line link test is provided under Administration -> Self-test. If the result is OK, a data link is established with the Volkswagen network. This link test does not check access to the Audi data base. An additional test is provided for this purpose in the "Assisted fault-finding" menu.



294\_029



The on-line system test as part of assisted fault-finding checks the transfer of data from the tester via the Volkswagen network to the Audi data base and back again and is thus more comprehensive than the "Administration" -> "Self-test" menu. This test does not require the diagnosis tester to be connected to a vehicle. The user ID and password of the mechanic are however needed and are also checked by way of the on-line link. The system test will not be OK if ID or password is not correctly entered.



294\_030

| No | tes |  |
|----|-----|--|
|    |     |  |
|    |     |  |
|    |     |  |

|  | No | tes |  |
|--|----|-----|--|
|  |    |     |  |
|  |    |     |  |

All rights reserved. Subject to technical modification. Copyright\* 2002 AUDI AG, Ingolstadt Department I/VK-35 D-85045 Ingolstadt Fax 0841/89-36367 000.2811.14.20 Technical status as at 08/02 Printed in Germany