



Unlock procedure for SFD (Vehicle Diagnostic Protection)

We wish to inform you that, as of 2020, Volkswagen AG will introduce a new procedure for Vehicle Diagnostic Protection (SFD). In order to utilise the SFD procedure, it is necessary for users to be registered in advance on the SFD back end.

The aim of SFD

Product analyses in the VW Group have shown that there is an increased requirement for protection of data in vehicles. This is also the case for Vehicle Diagnostic Protection. The previous procedure (activation of security access by way of a 5-digit login code) no longer conforms to the state of the art. As of 2020 – beginning with the market entry of the MQB37W (Golf 8) – there will be a cross-brand introduction of the SFD procedure in order to provide Vehicle Diagnostic Protection.

SFD will be introduced in two project stages:

Stage 1 comprises access protection of protected diagnostic objects in control units and the verifiability of this access on an individual level. The protection requirement will be defined for specific control units and diagnostic objects. The protection requirement is limited to specific writing services (codings, adjustments, parametrisations) and routines. Normal reading services (e.g. readout of control unit event memories) will not be SFD-protected. The functions of data string downloading with boot loader data strings, flashing and/or update programming as well as flash data security are also not affected by SFD.

Stage 2 includes, as a supplement to stage 1, tamper protection of diagnostic contents upon integration of the diagnostic contents by end-to-end safeguarding of diagnostic data between VAG IT back end systems and control units.

In order to be able to log access to diagnostic contents requiring protection in future, the IT security organisation requires strong user authentication to be enforced. It is therefore necessary to use two-factor authentication, which can be implemented, for example, by using

- PKI-cards
- SecurID-cards
- Applications that generate one-time passwords (e.g. Google Authenticator or Microsoft Authenticator).



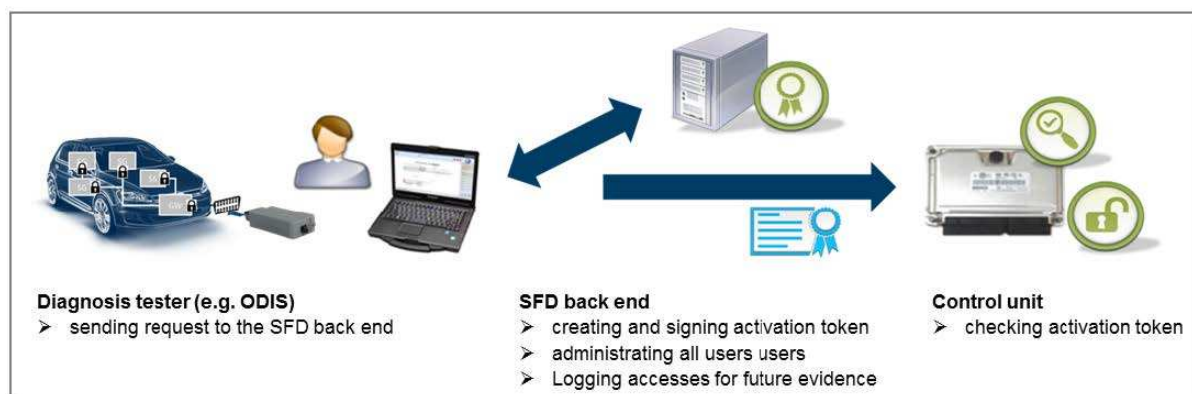
In a first transition phase, however, weak authentication by way of a username and password will initially be introduced when using the Dealer Portal. The transition to strong authentication by means of the Group Retail Portal will be developed in parallel.

The SFD process requires the vehicle diagnostic tester to have an online connection.

Functioning of SFD

Two methods will be offered: online activation and offline activation. The offline activation is a fall-back solution in the event that, for example, the online connection of the vehicle diagnostic tester in the workshop is unavailable at short notice.

1. Online activation (standard case)



Components involved:

- The control unit in the vehicle contains the diagnostic objects to be protected and grants or refuses access.
- The vehicle diagnostic tester is operated by the user in order to select diagnostic objects in the control unit.
- The SFD back end contains the user database with authorizations and issues activation tokens.

Basic process:

1. It is a prerequisite that the user is registered in the SFD IT back end and in the Dealer Portal (in future, the Group Retail Portal).
2. The user would like to carry out SFD-protected services on one or more SFD-protected control units as part of a vehicle diagnosis.



3. The control unit reports that it is SFD-protected and asks for an activation token.
4. The vehicle diagnostic tester sends an activation request with the ID mark of the control unit and the desired scope to the SFD IT back end.
5. The SFD IT back end checks and authorizes the request and sends a signed activation token to the tester. The SFD IT back end logs the access (user ID, CU ID mark, time etc.).
6. The vehicle diagnostic tester sends the activation token to the control unit. The control unit checks the activation token and grants access to the relevant diagnostic object.

2. Manual SFD activation (offline – fall-back solution)

Process for an offline activation:

1. A direct online token generation with the vehicle diagnostic tester does not work.
2. The workshop employee saves the activation request structure of the control unit that will be necessary for the generation of the token.
3. The user logs into the Dealer Portal (in future, the Group Retail Portal) using a different computer and accesses the token generation website of the SFD back end via the SFD application.
4. The user enters the activation request structure of the control unit, generates an activation token with it, and copies this over to the vehicle diagnostic tester (e.g. using a USB stick).
5. The user executes a function on the tester in order to send the activation token manually to the control unit.
6. The control unit checks the activation token and grants access to the relevant diagnostic object.

Registration of users in the Dealer Portal and in the SFD IT back end

Upon the introduction of SFD in the first half of 2020, diagnostic users must be in a position to authenticate themselves in the SFD IT back end in accordance with the two activation options described above. In order to achieve this, it is necessary to register on the SFD back end in advance.

The local administrators of the Dealer Portal only have to assign the standard role in the “SFD” application to the affected users in the “Local user administration”. Synchronisation with the SFD IT back end then takes place overnight, so the users are able to execute SFD-protected functions after no more than **24 hours**.



Offboard Diagnostic Information System Service Unlock procedure for SFD



If there is no local administrator in your company, please contact the respective importer.

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Dealer portal.

Local administration

Edit data of the organization

Create new user

Assign applications

My Favorites

administrate

Portal Administration.

Basedata Applications

Allowed applications

- + Marketingportal
- + ODIS eShop
- + Online-Produkttraining (Volkswagen Welt)
- + Service Key
- SFD Standard-Rolle
- + Volkswagen InfoNet
- + Volkswagen Nutzfahrzeuge InfoNet
- + Volkswagen ServiceNet
- + Wartungskalender

Cancel Reset Submit Portal Logout

Authentication of users during the diagnostic session

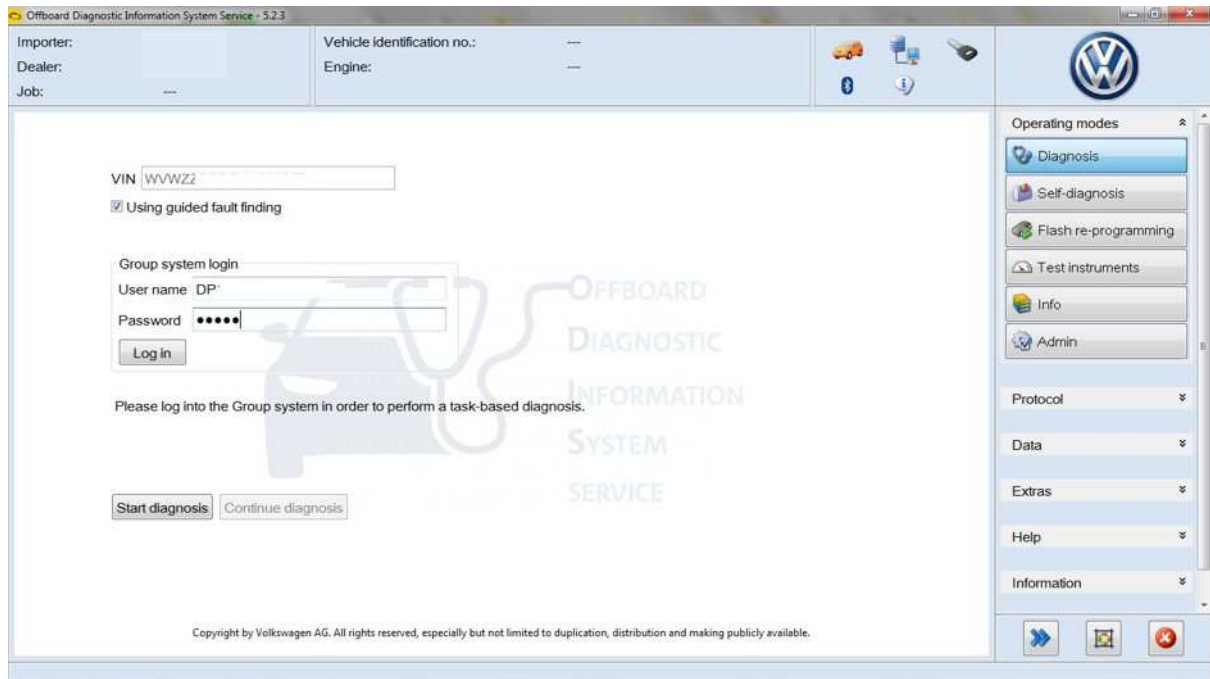
1. Working with Guided Fault Finding (recommended)

In a diagnostic start-up via “Guided Fault Finding” (recommended), essentially nothing changes for the user, because upon logging into the Dealer Portal at the start of the diagnostic session, the login details are used automatically to generate the SFD activation tokens.



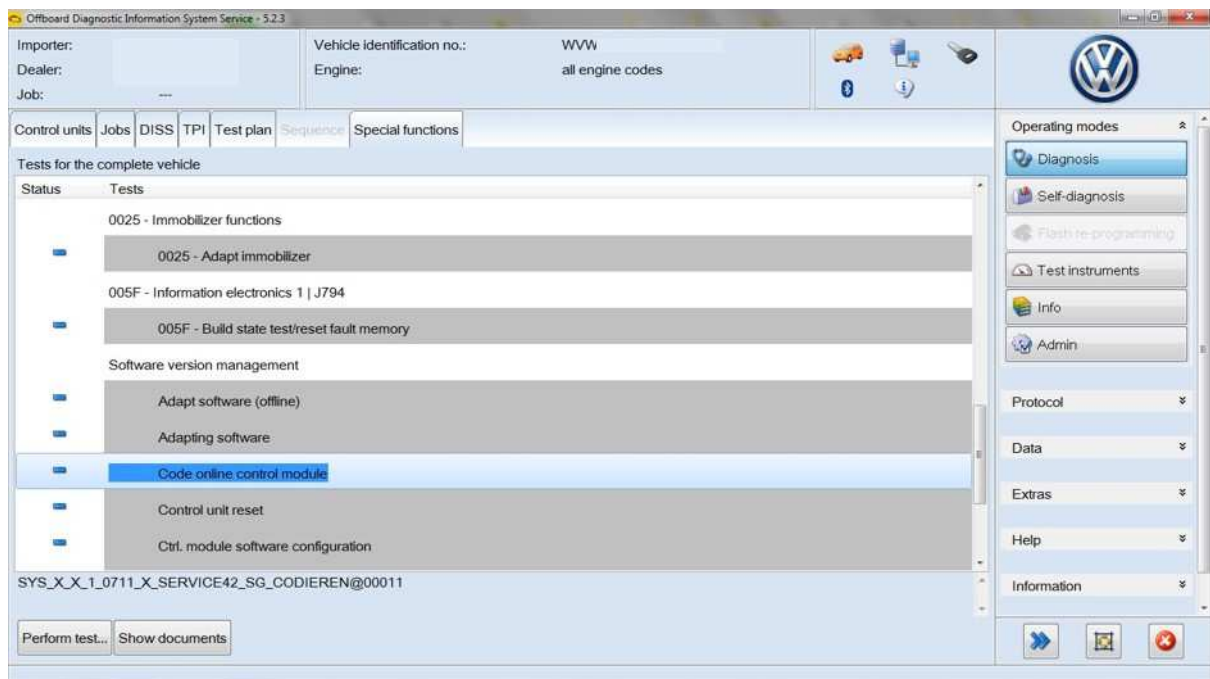
Offboard Diagnostic Information System Service

Unlock procedure for SFD



After this log in, necessary SFD activation tokens for work on the control units are generated automatically in the background.

After vehicle identification and reading DTCs you select an SFD-protected function (in the example, online coding) on an SFD-protected control unit (in example 15, Airbag):

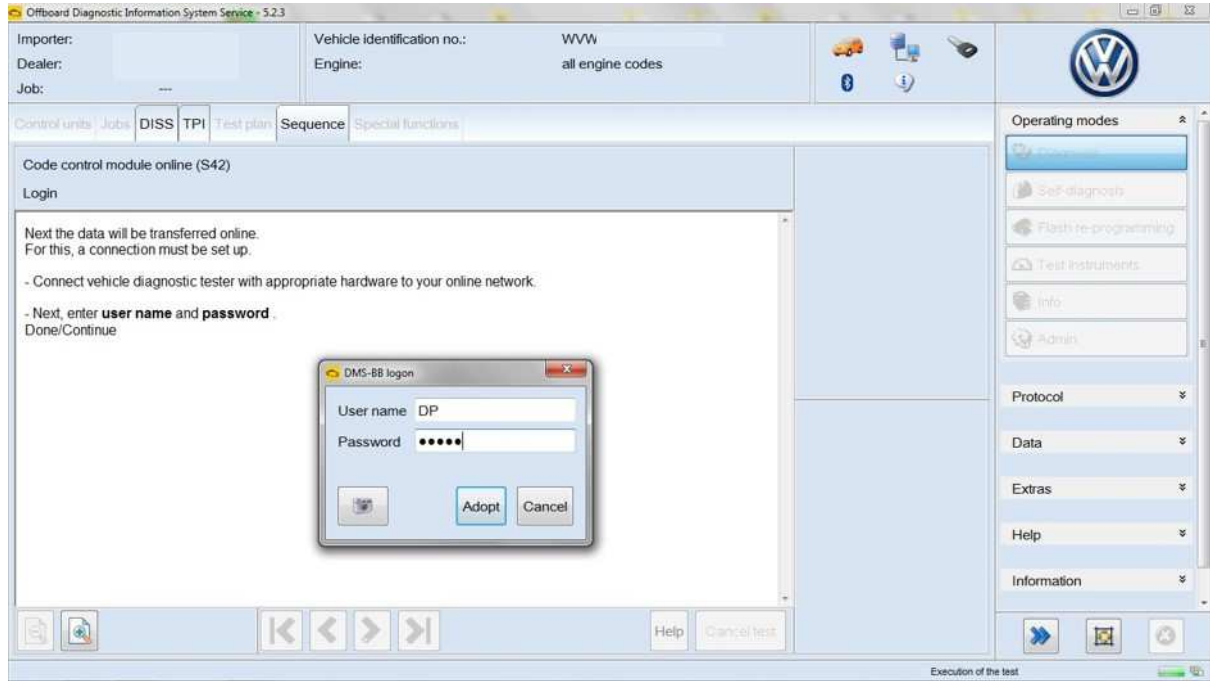




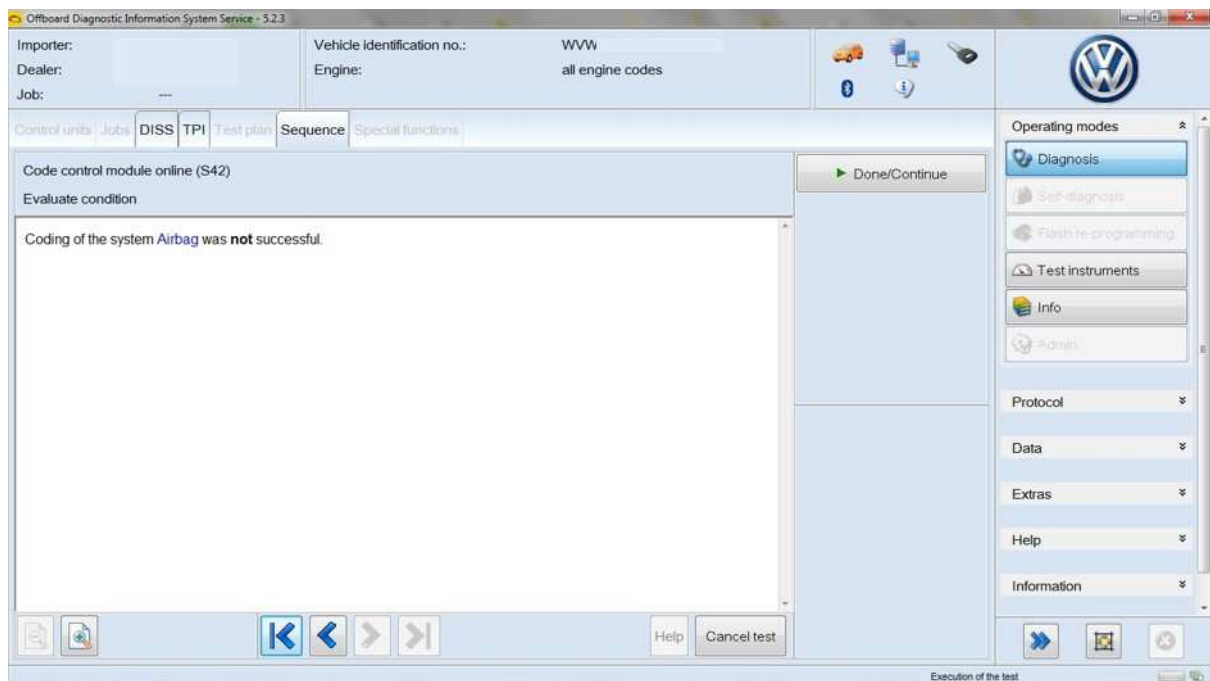
Offboard Diagnostic Information System Service Unlock procedure for SFD



Afterwards you have to log in again for online coding (Service 42 / SVM), as was also the case previously:



The SFD-protected airbag control unit has been automatically opened for the write operation and the coding has been carried out successfully:





Offboard Diagnostic Information System Service Unlock procedure for SFD



When using Guided Fault Finding SFD-protected control units are automatically locked at the end of the diagnostic session.

2. Working with Self-diagnosis: online activation

In a diagnostic start-up via “Self-diagnosis”, after selecting a control unit you can establish whether the control unit is SFD-protected using the “Display measured values” function (Measured value [MAS 18157]_SFD activated status). In order to activate it, select the “Access authorization” option:

The screenshot shows the 'Offboard Diagnostic Information System Service - 5.2.3' interface. At the top, there are fields for 'Importer:', 'Dealer:', 'Job:', 'Vehicle identification no.:', and 'Engine:'. Below this, there are tabs for 'Control units' and 'Results'. The main area is titled 'Measured values - Show measured values' and displays a table with columns 'Name' and 'Value'. The table contains several rows of diagnostic data. A dropdown menu is open over the table, showing options: 'Access authorisation', 'Fault memory', 'Identification', 'Actuator diagnosis', 'Basic setting', 'Coding', 'Code bus master', 'Measured values', 'Adaption', 'Access authorisation', and 'Data upload'. The 'Access authorisation' option is highlighted. On the right side, there is a sidebar with 'Operating modes' including 'Diagnosis', 'Self-diagnosis', 'Flash re-programming', 'Test instruments', 'Info', and 'Admin'. At the bottom, there are navigation buttons and a status bar showing 'EV_AirbaVW40SMEVW38X_001028_d' and 'Reading measured values: (0%)'.

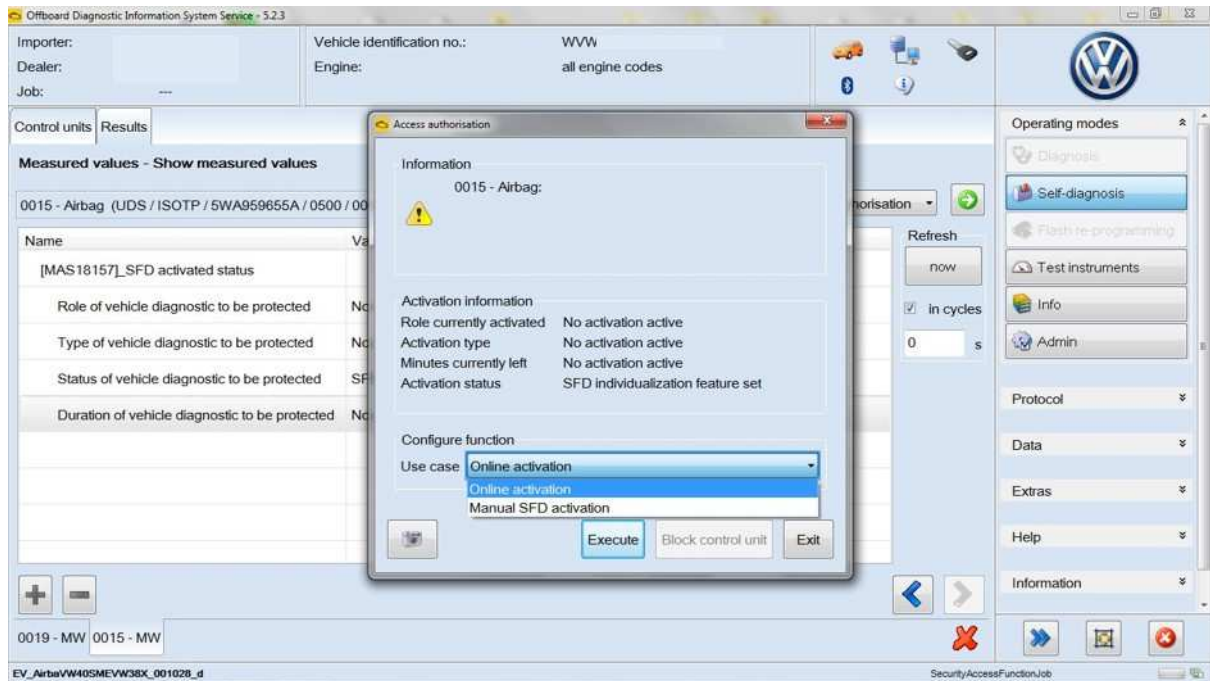
Name	Value
[MAS18157]_SFD activated status	
Role of vehicle diagnostic to be protected	No activation active
Type of vehicle diagnostic to be protected	No activation active
Status of vehicle diagnostic to be protected	SFD individualization feature set
Duration of vehicle diagnostic to be protected	No activation active



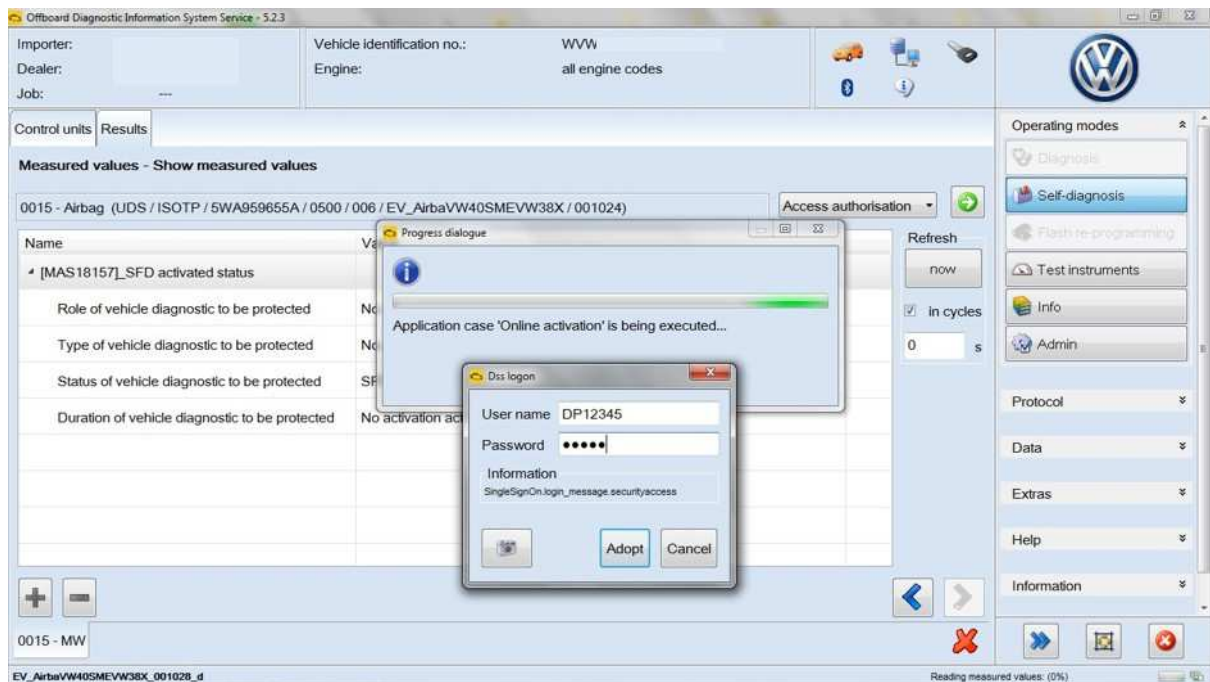
Offboard Diagnostic Information System Service Unlock procedure for SFD



Then select the “Online activation” use case (standard case):



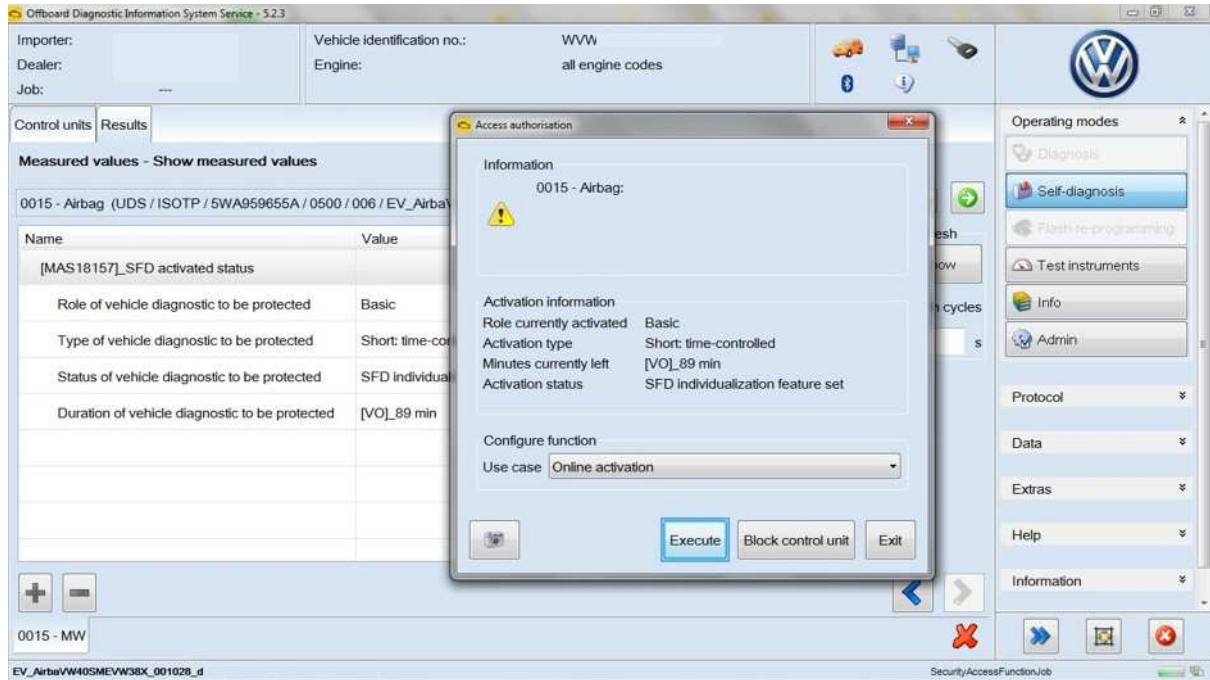
Then log in with your Dealer Portal login details:



The activation status displays the activated role and the remaining activation period:

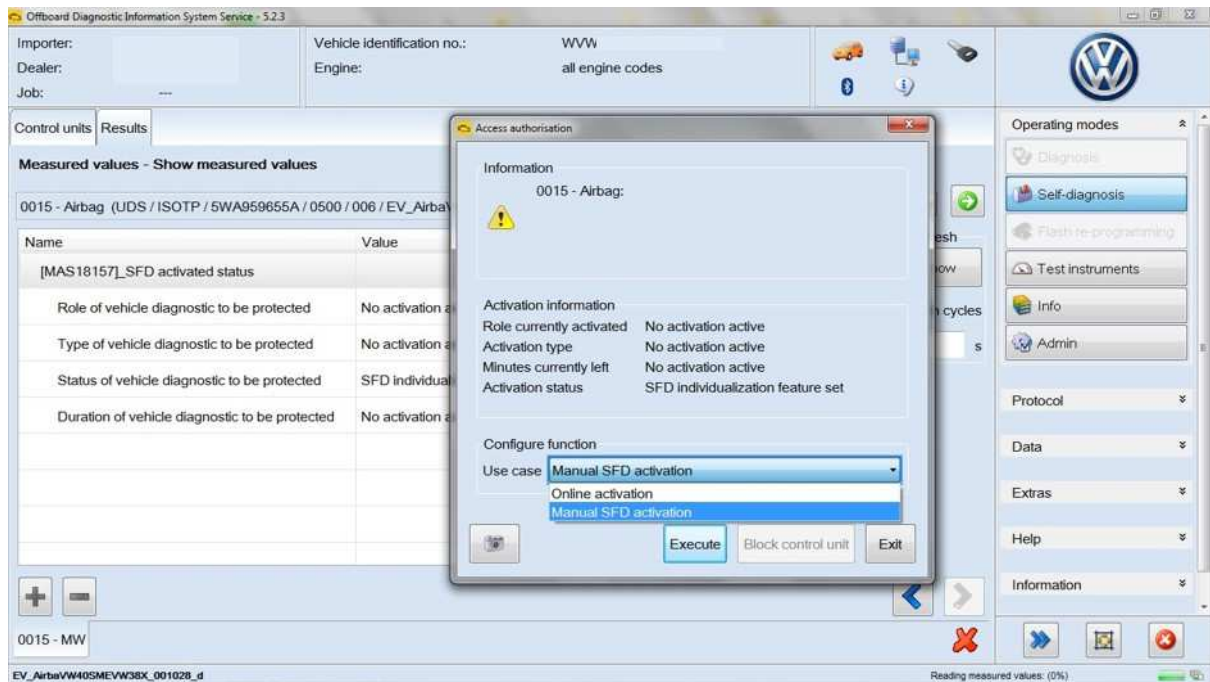


Offboard Diagnostic Information System Service Unlock procedure for SFD



3. Working with Self-diagnosis: manual SFD activation (offline)

If there is no online connection from the vehicle diagnostic tester to the workshop network, after selecting “Access authorisation” select “Manual SFD activation”:

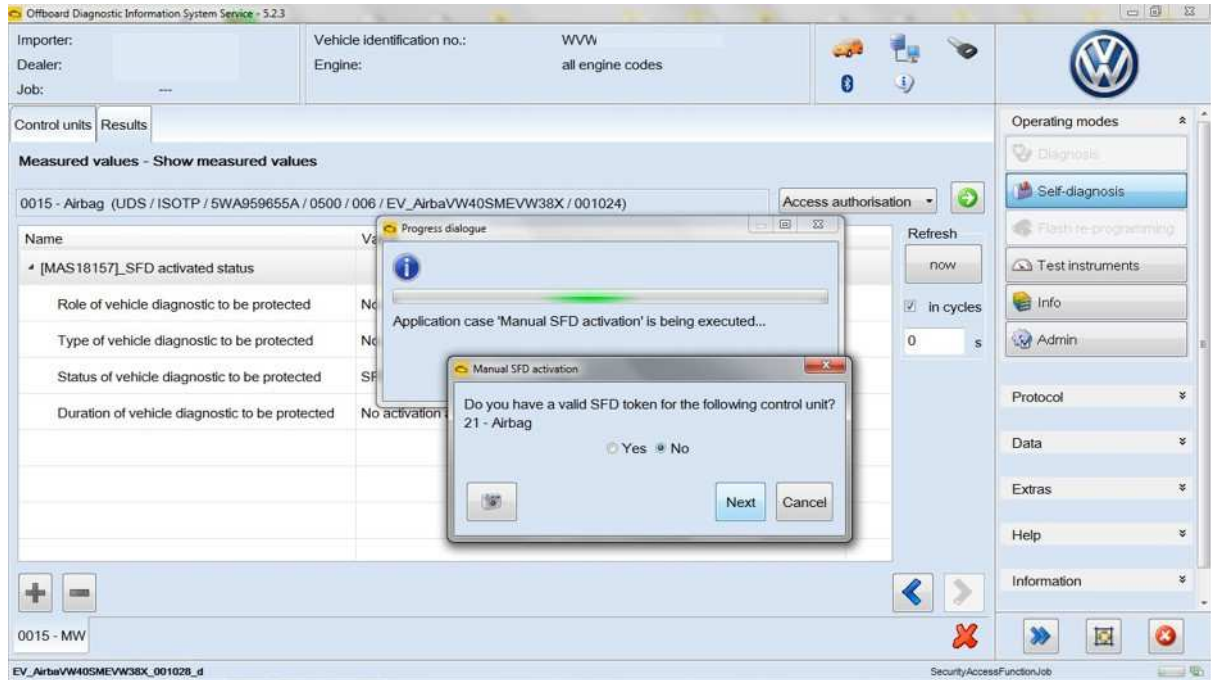


If an activation token has not yet been generated, answer “No” to the following question:

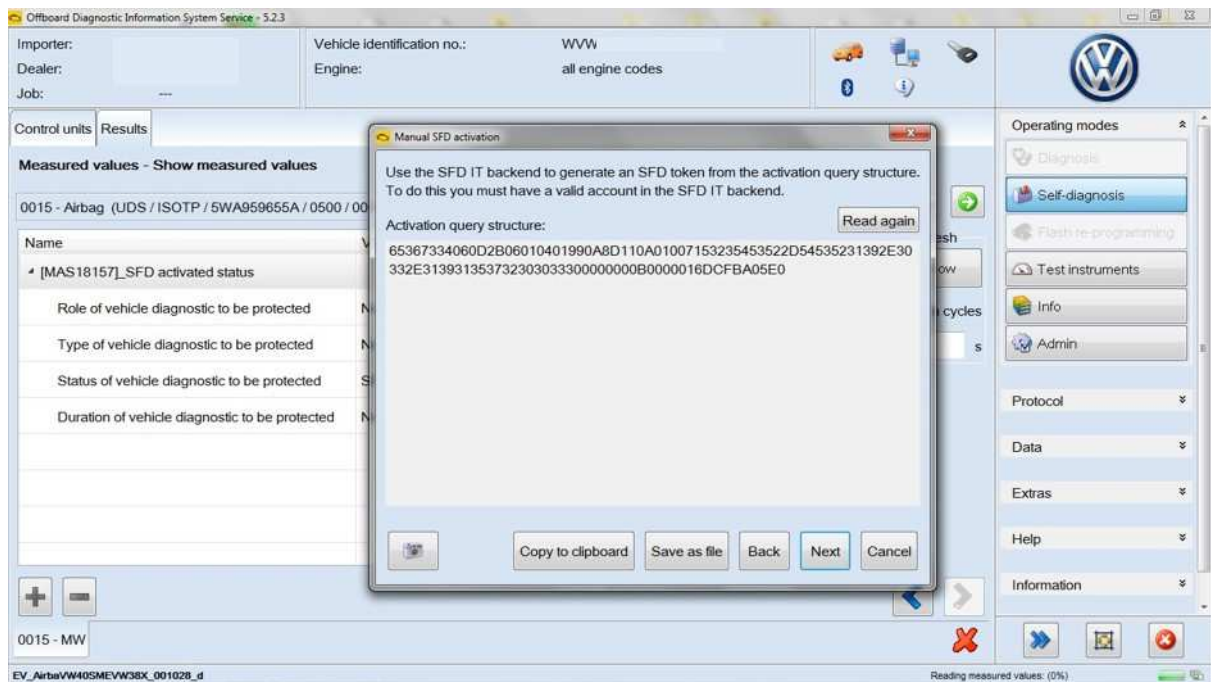


Offboard Diagnostic Information System Service

Unlock procedure for SFD



The activation request structure generated by the control unit is required so that the SFD back end can generate an activation token. You can now either copy the structure to the clipboard or save it in a file:



Then open the “SFD” application in the Dealer Portal:



Offboard Diagnostic Information System Service

Unlock procedure for SFD



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Dealer portal.

My Favorites

administrate

Status: Data successfully saved

Welcome.

Applications | System messages | Notifications

Please select one of the following applications:

- DISS Monitor
- Elektronisches Service Auskunftssystem (ELSA)
- ElsaPro
- Feedback Monitor
- Lokale Benutzerverwaltung
- ODIS eShop
- SFD**
- Volkswagen InfoNet
- Volkswagen ServiceNet

You can access these applications via internet :

- Feedback Monitor
- Lokale Benutzerverwaltung

My Profile | Logout

Then you can access the token generation website of the SFD back end. There you enter the previously determined activation request structure and the vehicle identification number and select the brand:

SFD - Vehicle Diagnostics Protection This system is classified as confidential! Retail User en

TOKEN RETRIEVAL

Token retrieval > Manual SFD activation

This screen provides the fallback solution to retrieve SFD tokens for unlock request structures.

Here you can enter the unlock request structure (hex) for the token:
65367334060D2B06010401990A8D1110A01007153235453522D54535231392E30332E31393135373230303330000000B0000016DCFB/

Or upload the unlock request structure (hex). Only text files (.txt) can be uploaded:
+ Choose

Please select the brand of the vehicle:
Volkswagen

Please enter the 17 digits VIN of the vehicle:
WVWZi

Token output (hex):

DOWNLOAD TOKEN COPY THE TOKEN TO THE CLIPBOARD

CLEAN UP REQUEST STRUCTURE REQUEST A TOKEN

The required activation token is generated by clicking on "Request a token":



Offboard Diagnostic Information System Service

Unlock procedure for SFD



SFD - Vehicle Diagnostics Protection This system is classified as confidential! Retail User en

TOKEN RETRIEVAL

REQUEST A TOKEN

Token output (hex):

```
7f218201d17f4e495f290170420d444555565747505346000000b7f4c33060d2b06010401990a8d110a01000153225453522d5453523139
2e30332e313931353732303033300201010000016dd48b607e5f37820180360a75eda24e29177e077b2b23d7a76a6852bcacf15dafd176019
60c62d6b08e78f8cc5ac8641499fcadbaf5dfc3623333bbdf96f9f481d08353b5d83d7f06a80db1adf800ea118bc25b8ea8246859dc4f0c54ed
2688e31eea05b154567693dc1ec839863508e51d4c26ca77c08feaf5b080be3734f759fc1e8c2d872e3e9534f340df8027fae57624c69ada24e
5f11e99aa820ada103b3454fa4f29a0d58216275e86bfc8fe53d7a0ab8ce0fa1a182bc96f4440a1d541c8652cf882ef67d614ecfee6fe8dfe6b8
47e615822bf8e64674371c9b72fefac15fe21a2421e2eb370a7c8066500716a52f70b4bb7ab66f16ce2cbdfbfa7983a5f9ca18363f7e65cfe546
b827f6072a61cde2de768f7d2a69f359c8a1f9b6de939c52b6ddd7c5cd7b6dc1acbfd5e83cd6df21e3cbd6a5608975ab5006d3f2b75c3afe955
fd02954292c1ae0f6ade8616c1f8e5c973be70f70a494c0d0857a6783c27b743d90bff251ef8aea9a6701ac5d2ea8b7e845e3517a1b1faa7a96
2371e857eb76de69b0272ba
```

DOWNLOAD TOKEN **COPY THE TOKEN TO THE CLIPBOARD**

Back in ODIS, once you have the required activation token, answer “Yes” to the following question:

Offboard Diagnostic Information System Service - 5.2.3

Importer: Vehicle identification no.: WWW
Dealer: Engine: all engine codes

Control units Results

Measured values - Show measured values

0015 - Airbag (UDS / ISOTP / 5WA959655A / 0500 / 006 / EV_AirbaVW40SMEVW38X / 001024) Access authorisation

Name	Value
[MAS18157]_SFD activated status	Yes
Role of vehicle diagnostic to be protected	No
Type of vehicle diagnostic to be protected	No
Status of vehicle diagnostic to be protected	SFD
Duration of vehicle diagnostic to be protected	No activation

Manual SFD activation

Do you have a valid SFD token for the following control unit?
21 - Airbag

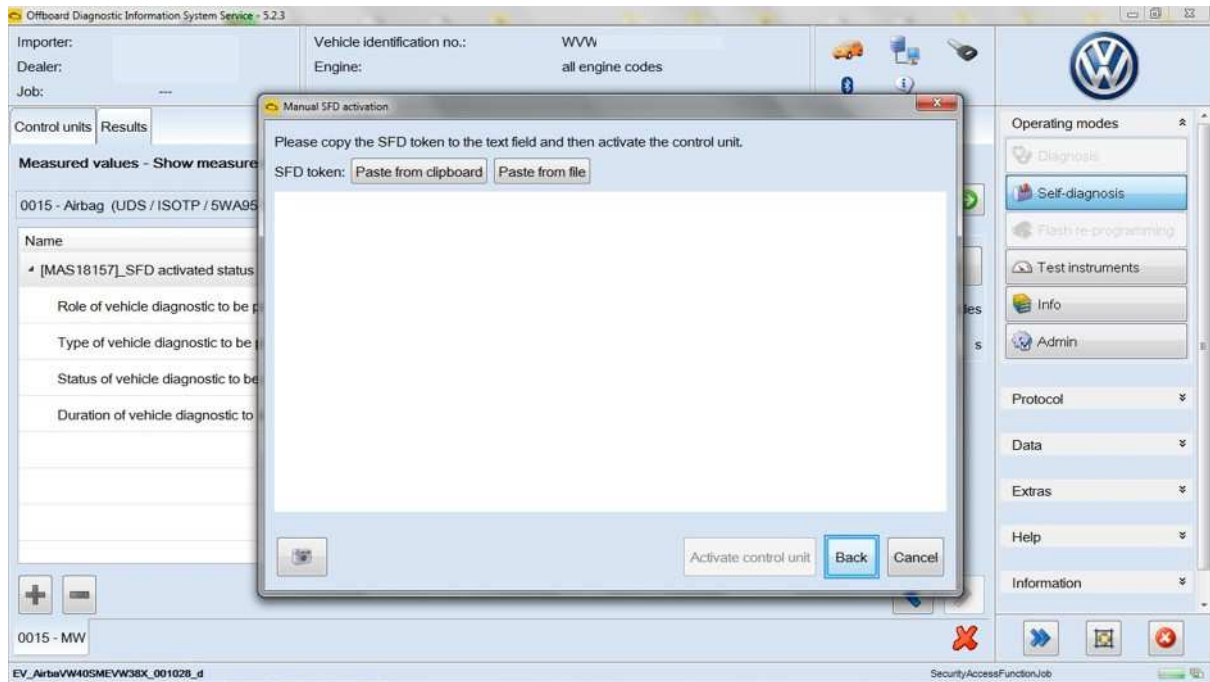
Yes No

Next Cancel

Then enter the activation token, either via the clipboard or from a file:



Offboard Diagnostic Information System Service Unlock procedure for SFD



Please note:

Each activation token is specific to the control unit and usable only one time!!

4. Locking the control units again

When using Guided Fault Finding SFD-protected control units are automatically locked at the end of the diagnostic session. Otherwise they are also automatically locked again 90 minutes after activation.

Each control unit can also be locked again manually, however, by clicking the “Block control unit” button for an open control unit:



Offboard Diagnostic Information System Service Unlock procedure for SFD



Offboard Diagnostic Information System Service - 5.2.3

Importer: Vehicle identification no.: VWV
Dealer: Engine: all engine codes

Control units Results

Measured values - Show measured values

0015 - Airbag (UIDS / ISOTP / 5WA959655A / 0500 / 006 / EV

Name	Value
[MAS18157]_SFD activated status	
Role of vehicle diagnostic to be protected	Basic
Type of vehicle diagnostic to be protected	Short: ti
Status of vehicle diagnostic to be protected	SFD in
Duration of vehicle diagnostic to be protected	[VO]_89

0015 - MW

EV_AirbaVW40SMEVW38X_001028_d

Reading measured values: (0%)

Answer "Yes" to the corresponding enquiry:

Offboard Diagnostic Information System Service - 5.2.3

Importer: Vehicle identification no.: VWV
Dealer: Engine: all engine codes

Control units Results

Measured values - Show measured values

0015 - Airbag (UIDS / ISOTP / 5WA959655A / 0500 / 006 / EV

Name	Value
[MAS18157]_SFD activated status	
Role of vehicle diagnostic to be protected	Basic
Type of vehicle diagnostic to be protected	Short: ti
Status of vehicle diagnostic to be protected	SFD in
Duration of vehicle diagnostic to be protected	[VO]_89

0015 - MW

EV_AirbaVW40SMEVW38X_001028_d

SecurityAccessFunctionJob

The activation status now shows that the control unit is locked. You can then activate it again:



Offboard Diagnostic Information System Service

Unlock procedure for SFD



The screenshot shows the 'Access authorisation' dialog box for the 0015 - Airbag control unit. The dialog box contains the following information:

- Information:** 0015 - Airbag: (Warning icon)
- Activation information:**
 - Role currently activated: No activation active
 - Activation type: No activation active
 - Minutes currently left: No activation active
 - Activation status: SFD individualization feature set
- Configure function:** Use case: Online activation

Buttons: Execute, Block control unit, Exit

Alternatively, all of the control units can also be locked at once by selecting “Block vehicle”:

The screenshot shows the 'Control unit self-diagnosis' dropdown menu with the 'Block vehicle' option selected. The menu items are:

- Complete fault memory
- Transport mode
- Customer service OBD
- Engine assembly
- Block vehicle

The main interface shows a list of control units with their status:

System	SB	Event
0019 - Gateway (UD)		Event
0001 - Engine Control		Event
0002 - Transmission Control Module		Event
0003 - Brakes 1		Event
0008 - Air Conditioning		Event
0009 - Central Electrics (UDS / ISOTP / --- / --- / ---)		OK
0013 - Adaptive Cruise Control		Event
0015 - Airbag (UDS / ISOTP / 5WA959655A / 0500 / 006 / EV_AirbaVW40SMEVW38X 001024)		Event
0017 - Dash Board		Event
0017 - Dash Board		OK

Then the locking of the vehicle is confirmed by clicking on “Yes”.



Offboard Diagnostic Information System Service

Unlock procedure for SFD



Offboard Diagnostic Information System Service - 5.2.3

Importer: Vehicle identification no.: VWV
Dealer: Engine: all engine codes
Job: ---

Control units Results

Vehicle self-diagnosis: Block vehicle Control unit self-diagnosis: Fault memory

System

System	SB	Event
0019 - Gateway (UDS / ISOTP / --- / --- / --- /)		Event
0001 - Engine Control Module 1		
0002 - Transmission Control Module		
0003 - Brakes 1		
0008 - Air Conditioning		
0009 - Central Electrics (UDS / ISOTP / --- / --- / --- /)		
0013 - Adaptive Cruise Control		Event
0015 - Airbag (UDS / ISOTP / 5WA959655A / 0500 / 006 / EV_AirbaVW40SMEVW38X 001024)		Event
0017 - Dash Board		Event
0017 - Dash Board		OK

Block diagram Control unit list Installation list Fault memory list Equipment list

Self-diagnosis Displaying... Settings

RemoveVehicleAccessRightsJob

You will receive a response as to which control units have successfully been locked:

Offboard Diagnostic Information System Service - 5.2.3

Importer: Vehicle identification no.: VWV
Dealer: Engine: all engine codes
Job: ---

Control units Results

Vehicle self-diagnosis: Block vehicle Control unit self-diagnosis: Fault memory

System

System	SB	Event
0019 - Gateway (UDS / ISOTP / --- / --- / --- /)		Event
0001 - Engine Control Module 1		
0002 - Transmission Control Module		
0003 - Brakes 1		
0008 - Air Conditioning		
0009 - Central Electrics (UDS / ISOTP / --- / --- / --- /)		
0013 - Adaptive Cruise Control		Event
0015 - Airbag (UDS / ISOTP / 5WA959655A / 0500 / 006 / EV_AirbaVW40SMEVW38X 001024)		Event
0017 - Dash Board		Event
0017 - Dash Board		OK

Block diagram Control unit list Installation list Fault memory list Equipment list

Self-diagnosis Displaying... Settings

RemoveVehicleAccessRightsJob