

Body and Accessories

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Immobilizer or Driver Authorization System (DAS)**System Description**

All M-Class vehicles are equipped with the Driver Authorization System controlled by the All Activity Module (AAM) N10 through a CAN bus that communicates with the ME-SFI control module (N3/10).

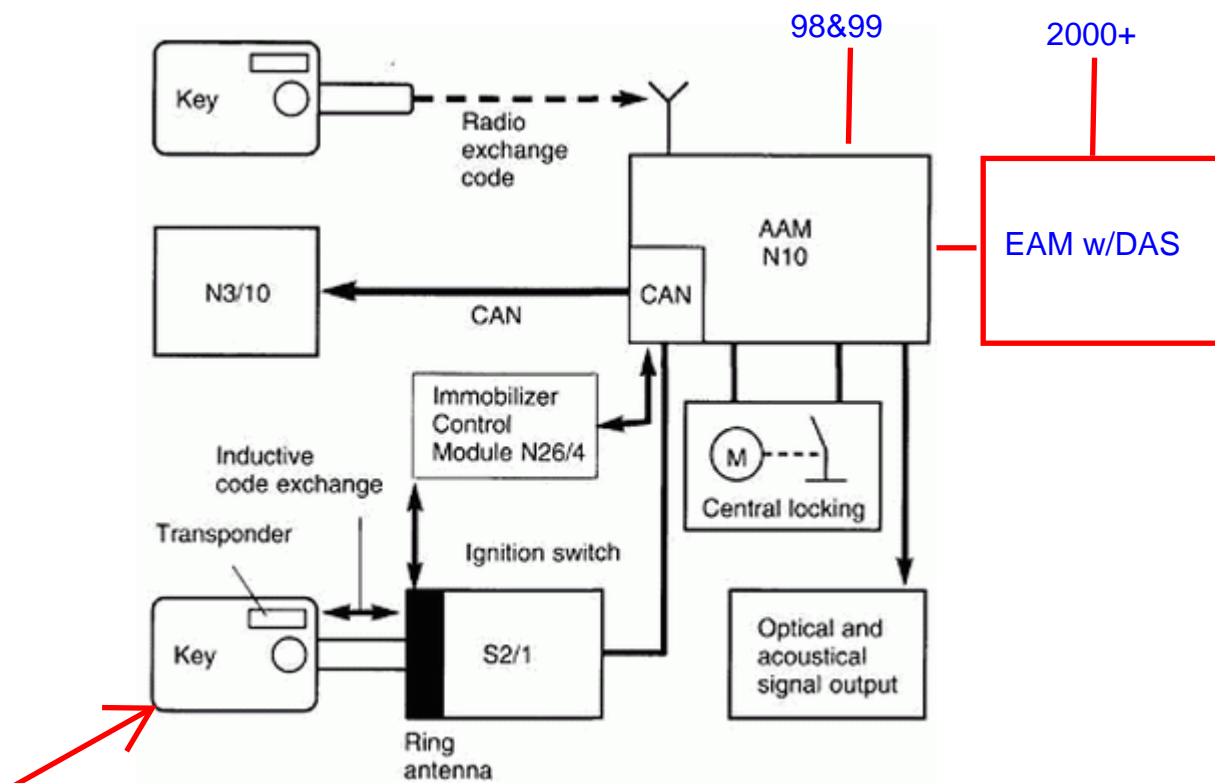
At each start attempt, the AAM and ECM exchange codes. The AAM approves of fuel enabling by the ECM only if it recognizes a valid key code in the ignition system. With an invalid code, the starter may operate, but the engine will not be allowed to start.

DAS uses an ignition key module containing a transponder (EEPROM memory) in which a fixed and rolling access code is written. This code is read by the AAM (N10) and compared with the code stored in the AAM. If the AAM recognizes the code as "correct," it creates a new rolling code and writes it into the transponder of the key. In this way the code always changes to provide engine starting only with the "correct" key.

The AAM generates a new rolling code every time the system recognizes a valid key in the ignition switch.

System Operation

Any reference to AAM is correct for 98&99 only. Starting with MY 2000 the task was moved to the EAM.

Central Locking System Flow Chart**System Service****Note:**

At the time of publication, the diagnostic software was not complete. The information below is subject to change.

Teach Transponder Codes (Engage)

A virgin AAM learns which keys have to be accepted to operate the immobilization system by reading the information stored in the new one-way master key (spare key without radio-control function). The one-way master key then becomes a standard spare key.

Preconditions

The new one-way master key must be inserted in the steering lock (S1) at position "O." The Hand Held Tester (HHT) must be used to perform the teaching procedure.

Attention!

Repetition of this procedure is limited! There are two ways to interlock this function:

Manually: by Hand Held Tester (HHT) interlock teaching transponder codes procedure (marry).

Automatically: the possibility to take over transponder codes from the one-way master key is irreversibly interlocked by the system after 60 ignition On/Off-cycles.

Any new teaching operation that is executed before the 50th ignition cycle has been reached resets the counter to zero, i.e. the ignition can be switched On/Off again 50 times until an automatic locking occurs. The AAM automatically returns to standard function after termination of the routine.

AAM Operation

AAM reads the 8 possible transponder codes from the one-way master key and stores them. The ATA LED flashes if no one-way master key is in the ignition switch (flashing rate 1 Hz, 50% switch-on time). During teaching operation the ATA LED is permanently switched on. The routine is terminated when the LED is switched off (this is no indication for success or failure of the operation).

Notes:

The alternating codes of the transponder are not yet active after the "engagement," i.e. only fixed codes are used and checked.

Attention!

This procedure is irreversible and can only be executed once. The AAM automatically returns to standard function after termination of the routine. After the "marriage" the alternating codes of their transponders become active and the recycle master key process, which helps to restore the one-way master, is interlocked.

Checking the Transponder

With the key in the "O" position, the LED will flash to indicate transponder recognition.

Recycle One-Way Master Key

After the "engagement" (learning procedure) and before the "marriage" (code access is interlocked) the one-way master key can be recycled, i.e. the system can be "disengaged or separated" ("recycling of the one-way master key") using the HHT. Thus the AAM can be replaced and the keys and key accessories can be kept.

A one-way master key that has been converted to a standard spare key (engage procedures) can be recycled. Thus a defective AAM can be replaced and the keys and key accessories can be kept.

Attention!

This function is no longer active after "marriage" or automatic deactivation. The AAM automatically returns to standard function after termination of the routine.

Teach Transponder Codes (Marry)

If alteration of the AAM assignment to the maximum 8 keys becomes impossible, a definite, irreversible assignment of AAM to the respective keys and to the key accessories is executed using the Hand Held Tester (HHT).

Teach Radio Codes (Fixed Code and Alternating Codes)

This procedure is executed to teach a key to operate the ATA and the central locking. The key is simultaneously synchronized by the teaching procedure. Operating the central locking and the ATA then becomes possible.

Attention!

The HHT must know the key number (e.g. by first inserting the key into the ignition switch and pressing 2 buttons of the radio control for 15 seconds and then performing the synchronization procedure.

(See Service Tips, Group 80). The AAM automatically returns to standard function after termination of the synchronization process.

AAM Operation

The AAM learns the fixed part of the radio code of the called key and stores this part. It then synchronizes with the alternating part of the code.

The ATA LED flashes after the routine has been started (flashing rate 1Hz, 50% switch-on time). The synchronization frame of the called key has to be sent by twice pressing any button of the radio code key within 20 seconds to avoid an unsuccessful abort of the routine. The routine is terminated when the LED is switched off (this is no indication for success or failure of the operation). The AAM indicates the termination of the routine after having recognized the second button activation. The key however sends four synchronization frames each with a sending time of approximately 400ms. Therefore, the tester has to wait at least 1.6 seconds after the routine has been terminated until any button activation of this key is accepted. This button activation initiates the calculation of the alternating code window in the AAM that leads to another waiting time of 2.5 seconds. Furthermore the radio command which has been sent by this button activation is not yet executed. The AAM executes the respective operation only after the fourth button activation.

Service Tips

Teaching a radio remote transmitter key with the HHT for vehicle and AAM production from 10/1997:

- Start procedures for teach radio key with the HHT. The alarm LED E33 will be illuminated.
- On the remote transmitter hold the lock-all button
- While the lock-all button is depressed, press the unlock-all button five consecutive times.
- There will be two results: The LED E33 will turn off and the HHT will display "Key successfully taught"
- Press any command on the radio remote key and the ATA / central locking system system will be functioning.