FUB-FUB-FB-610005-K06 Antitheft Alarm System (DWA)

VIN: **WH99304**	Vehicle: **MINI / R60 / OFF-ROAD VEHICLE / COOPER S / N18 / USA / LL / AUTO / 2010 / 11**
System version: **1.0.8**	Data version: **2.27**

Anti-theft alarm system R55, R56

The anti-theft alarm system (DWA) detects and indicates attempted intrusions or manipulation on the vehicle.
The DWA monitors the contacts on the doors, the luggage compartment lid (R56) or splitdoor (R55) and the engine bonnet as well as the status of the tilt alarm sensor and the interior monitoring (R55: no contacts on the clubdoor).
The anti-theft alarm system consists of the ultrasonic interior movement detector (USIS) with 2 ultrasonic interior sensors (transmitter and receiver) and the siren with tilt alarm sensor.
If an attempt is made to break into the vehicle and enter the inside of vehicle, a DWA alarm is triggered.
The tilt alarm sensor (integrated in the siren) monitors the vehicle inclination. The tilt alarm sensor detects whether the vehicle is lifted or towed.
The DWA alarm is acoustic and visual:

- acoustic alarm via the siren (intermittent tone for approx. 30 seconds)
- visual alarm via the lighting system (hazard warning lights) for approx. 5 minutes.

The alarm can be coded depending on the country, e.g. the visual alarm (with hazard warning lights; with low beam; with high-beam headlight) and the alarm duration (interval: 1 time, 3 times or 8 times).

Brief description of components

The following components are described for the anti-theft alarm system (DWA):

Alarm system (DWA) control unit

The software for the DWA is integrated in the junction box electronics (JBE). The JBE controls the DWA.
All the relevant components of the DWA are directly or indirectly connected (via the K-CAN) to the JBE.
The JBE is also the executing control unit for the central-locking drives. The JBE handles activation of all the central-locking drives.
For example, if the CAS control unit releases unlocking of the vehicle, the doors are unlocked.
The JBE is a component of the junction box. The junction box is an assembly consisting of the junction box electronics and distribution box. The distribution box supplies the siren with tilt alarm sensor with terminal 30.
The JBE and distribution box cannot be replaced **individually**.
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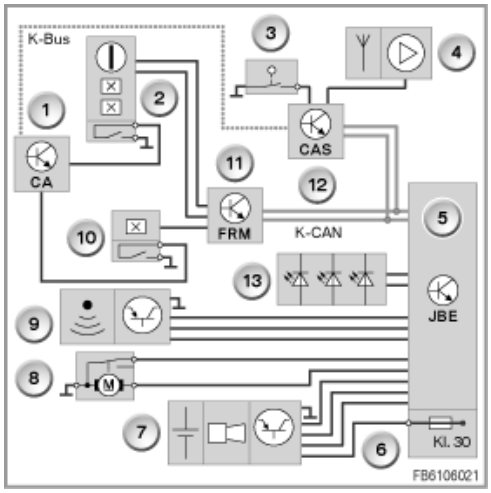
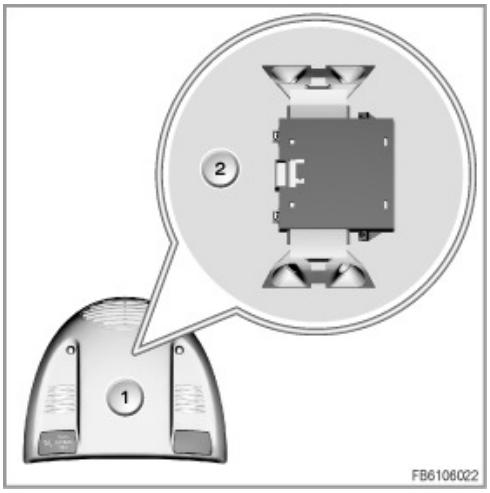


Index	Explanation	Index	Explanation
1	Comfort Access (CA)	2	Outer door handle on driver's side with door contact on driver's side as well as (with comfort access) button on outer door handle on driver's side
3	Bonnet contact switch	4	Aerial diversity
5	Junction box electronics (JBE) in the junction box	6	Voltage distributor in the junction box
7	Siren with tilt alarm sensor	8	Central-locking drive for luggage compartment lid (R56) or splitdoor (R55)
9	Ultrasonic interior movement detector (USIS) with 2 ultrasonic interior sensors	10	Door contact on passenger's side as well as (with comfort access) button on outer door handle on passenger's side
11	Footwell module (FRM)	12	Car Access System (CAS)
13	DWA LEDs (3 LEDs)		
K bus	Body bus	K CAN	Body CAN
Terminal 30	Terminal 30		

Ultrasonic interior movement detector

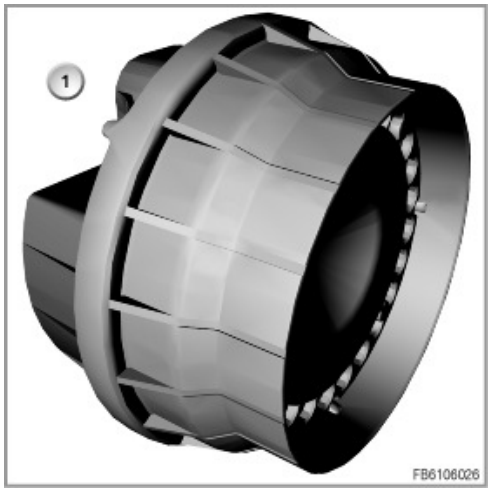
The ultrasonic interior movement detector (USIS) with the 2 ultrasonic interior sensors is fitted in the roof operating unit. The 2 ultrasonic interior sensors monitor the vehicle interior. The two ultrasonic interior sensors are installed in the adapter of the USIS that points to the vehicle interior.
The 2 ultrasonic interior sensors are motion detectors that form a transmit and receive unit. Here, one ultrasonic interior sensor assumes the function of a transmitter, the other the function of a receiver. Movements in the vehicle interior are detected if the reflection of the sonic waves (echo) changes.



Index	Explanation	Index	Explanation
1	Cover for the roof operating unit	2	Ultrasonic interior movement detector (USIS) with 2 ultrasonic interior sensors

Siren with tilt alarm sensor

The siren with tilt alarm sensor issues the acoustic DWA alarm. In addition to the DWA alarm, the siren can issue acoustic acknowledgement on arming or disarming (acknowledgement signal can be coded depending on the country; visual acknowledgement can be set by means of the Central Information Display (CID) and MINI joystick).
The tilt alarm sensor monitors the horizontal position of the vehicle (tilt monitoring of the vehicle in longitudinal direction and lateral direction). This detects the vehicle being raised, for example to steal the wheels or tow the vehicle away.
The parking position is stored using the current longitudinal angle and transverse angle. The tilt alarm sensor determines a new longitudinal angle and transverse angle every 100 milliseconds. If the alarm threshold is exceeded, the junction box electronics (JBE) trigger an alarm. After a first alarm, the alarm threshold is lowered, which leads to a more rapid second alarm activation.
The siren with tilt alarm sensor has a separate power supply (internal batteries) and also monitors the power supply by the vehicle battery. This means that an acoustic alarm can be output even if the supply cable to the siren with tilt alarm sensor has been manipulated.
The internal batteries are not rechargeable (service life at least 10 years or 300 autonomous alarm activations).



Index	Explanation	Index	Explanation
1	Siren with tilt alarm sensor		

Bonnet contact switch

The bonnet contact switch is connected to the CAS (Car Access System). This means that the engine bonnet is monitored (open or closed). The CAS forwards the message on the K-CAN to the junction box electronics (JBE).

Door contact on driver's side and passenger's side

The door contacts on the driver's side and passenger's side are connected to the footwell module (FRM). This monitors the doors (open or closed). The FRM forwards the message on the K-CAN to the junction box electronics (JBE).

Luggage compartment lid lock switch

The luggage compartment lid lock switch is integrated in the central-locking drive of the luggage compartment lid (R56) or splitdoor (R55). This monitors the luggage compartment lid or splitdoor (open or closed). The central-locking drive for the luggage compartment lid or splitdoor is connected to the junction box electronics (JBE).

FRM: Footwell module

The footwell module activates the lighting system for the visual DWA alarm. The junction box electronics (JBE) forward the request on the K-CAN to the FRM.

CAS: Car Access System

The CAS monitors the central-locking system. The CAS control unit is the master control unit for all functions run by Comfort Access.
The CAS forwards the signals on the K-CAN to the junction box electronics (JBE).

The CAS also delivers the following signals:

- Status of engine bonnet (open or closed)
- Status of convenience opening / convenience closing
- Authentication by the CAS as protection against manipulations
- Terminal status of terminal R or terminal 15

DWA LEDs

The 3 DWA LEDs indicate the states of the anti-theft alarm system (DWA) visually on the additional instrument. In addition, the 3 LEDs are to simulate the 'breathing' or 'heartbeat' of the MINI for a certain period on arming the DWA before the switch to the usual 'flashing'.
All 3 LEDs only light up during simulation of the ”heartbeat”.
To indicate the current state, only **one** LED is activated by the JBE.
The DWA LEDs are activated directly by the JBE across 2 lines.
The following displays are possible:

- DWA LED off: DWA is disarmed.
- ”Heartbeat” is simulated by the 3 DWA LEDs, then 1 DWA LED flashes continuously: DWA is armed.
- DWA LED flashes after locking for 10 seconds, then simulation of the ”heartbeat” and then flashes: DWA is armed, but a door or the bonnet / luggage compartment lid or splitdoor is not closed properly.
  Even if these are not closed, the rest is secured. The ultrasonic interior movement detector is not activated.
- DWA LED flashes after unlocking until the remote control is inserted in the insert compartment; maximum of 5 minutes: the vehicle has been manipulated
- DWA LED goes out after unlocking: DWA is disarmed.

Index	Explanation	Index	Explanation
1	Additional instrument	2	Display area of the DWA LEDs
3	Steering wheel		

System functions

The following system functions are described for the anti-theft alarm system:

- Arming and disarming
- Triggering the DWA alarm (alarm trigger signal)
- Undervoltage detection, overvoltage detection, monitoring the vehicle battery (battery positive cable and battery negative cable)
- Switching off the interior and tilt monitor
- Emergency function for the acoustic DWA alarm

- Cross-wise operation by means of lock barrel and remote control
- Access authorisation (Passive Entry) via the luggage compartment lid (R56) or splitdoor (R55)

Arming and disarming

The anti-theft alarm system (DWA) is armed on locking/double-locking the central-locking system.
Locking/double-locking presupposes:

- After terminal 15 OFF, the driver's door was opened and closed.
- 3 seconds after arming, the door contacts and lid contacts (bonnet and luggage compartment lid or splitdoor) are included in the monitoring.
  Precondition: Doors, bonnet and luggage compartment lid or splitdoor closed
- As visual acknowledgement, the 3 DWA LEDs start to simulate the ”heartbeat” for a certain time. Subsequently, 1 DWA LED flashes continuously. The hazard warning system flashes once.
- Depending on the national version, the siren can also issue a short sound signal.
- After arming the DWA and after all doors and lids (bonnet and luggage compartment lid or splitdoor) have been closed, the ultrasonic interior sensors start a reference run. After approx. 30 seconds, interior monitoring is possible.
- If the side windows and/or the slide/tilt sunroof are closed using convenience operation, the interior monitoring is not interrupted.

When all of the requirements needed for arming the DWA have been met, but the bonnet or luggage compartment lid or splitdoor or a door is open, although the DWA is armed the lid or door involved is not regarded as a trigger source. An open bonnet / luggage compartment lid / splitdoor or door is only regarded by the DWA as a valid trigger source after locking.
If only the engine bonnet is open on arming the DWA, the interior monitoring is activated as usual.
In the same way as the interior monitoring, the inclination monitoring only begins after the doors and bonnet/luggage compartment lid or splitdoor have been closed. After activating, the tilt alarm sensor first performs a reference run that takes 30 seconds. The tilt monitoring only begins after the reference run.
if the luggage compartment lid or splitdoor is opened during the reference run, the reference run is interrupted. After closing the luggage compartment lid or splitdoor, the reference run is restarted.
If a faulty door contact or lid contact is detected, it is assumed to be closed.
Unlocking the driver's door or the passenger's door disarms the alarm system. As visual acknowledgement, the DWA LED is switched off and the hazard warning system flashes twice. Depending on the national version, the siren can also issue a short sound signal.
The luggage compartment lid or splitdoor can be unlocked and opened using the remote control key without triggering an alarm even if the antitheft alarm is armed. When the luggage compartment lid or splitdoor is opened, the interior and tilt monitoring are disabled.
The interior and tilt monitoring are reactivated as soon as the luggage compartment lid or splitdoor is closed again. After closing the luggage compartment lid or splitdoor, the reference run is started.

Triggering the DWA alarm (alarm trigger signal)

A DWA alarm is triggered if the armed anti-theft alarm system detects an alarm status.
The following triggers lead to a DWA alarm:

- Forced opening of a door: bus signal from footwell module (door contact)
  - up to 05/2007: The DWA alarm is executed once.
  - as of 05/2007: The DWA alarm is executed 8 times.
- forced opening of the luggage compartment lid (R56) or splitdoor (R55): signal from the luggage compartment lid lock switch
  - up to 05/2007: The DWA alarm is executed once.
  - as of 05/2007: The DWA alarm is executed 8 times.
- Forced opening of the engine bonnet: bus signal from Car Access System (bonnet contact switch)
  - up to 05/2007: The DWA alarm is executed once.
  - as of 05/2007: The DWA alarm is executed 8 times.
- Movement in the inside of vehicle: signal from the ultrasonic interior sensors
  - up to 05/2007: The DWA alarm is executed 3 times.

    - as of 05/2007: The DWA alarm is executed 8 times.
- Car on an incline: signal from the tilt alarm sensor
    - up to 05/2007: The DWA alarm is executed 3 times.
    - as of 05/2007: The DWA alarm is executed 8 times.
- Undervoltage, overvoltage, monitoring the vehicle battery (positive cable and negative cable)
  Only the siren is activated. The alarm duration is coded on a country-specific basis (once, up to 3 times or up to 8 times; interval: 28.5 seconds activated - 5 seconds interrupt - 28.5 seconds activated - etc.).

When a DWA alarm is triggered, the alarm system control unit activates the loudspeakers of the siren. Simultaneously, the alarm system control unit sends an alarm signal on the K-CAN. The footwell module activates the visual alarm via the lighting system.

Alarm duration:

The DWA alarm is acoustic and visual. Depending on the coding, the DWA alarm is executed once, three times or up to 8 times.
The DWA alarm is executed once, i.e.:

- Siren activated for 28.5 seconds
- Visual alarm activated for 5 minutes

The DWA alarm is executed up to 3 times, i.e.:

- Siren activated 3 times for 28.5 seconds (each time with at least 5 seconds interruption)
- Visual alarm activated for 5 minutes

The DWA alarm is executed up to 3 times, i.e.:

- Siren activated 8 times for 28.5 seconds (each time with 5 seconds interruption)
- Visual alarm activated for 5 minutes

A DWA alarm is immediately cancelled under the following conditions:

- Disarming the anti-theft alarm system (DWA)
- Message ”Remote control in the insert compartment” (from CAS) and terminal 15 On

Undervoltage detection, overvoltage detection, monitoring the vehicle battery (battery positive cable and battery negative cable)

When the DWA is armed, the junction box electronics monitor the on-board supply voltage in a range between 6.5 Volts and 18 Volts with regard to the following points:

- Undervoltage: on-board supply voltage less than 6.5 Volts
- Overvoltage: on-board supply voltage greater than 18 Volts
- Drop in the on-board supply voltage from 7.5 Volts to 6.5 Volts within 40 minutes
- Disconnecting the battery positive cable or the battery negative cable

The voltage thresholds for overvoltage and undervoltage must be detected for at least 250 milliseconds.

Switching off the interior and tilt monitor

Deactivating of the passenger compartment and tilt monitor makes sense under the following conditions:

- Transport of the vehicle (e.g. rail, ferry)
- Parking the vehicle in a duplex garage
- Leaving persons or animals behind in the vehicle

The interior and tilt monitoring is disabled if the command ”Lock/double-lock” is executed twice within 10 seconds (e.g. with the remote control).
The DWA LED indicates the deactivation by flashing 3 times within one second and then simulating the 'heartbeat' for a certain time. When the time elapses, the DWA LED flashes continuously.

Emergency function for the acoustic DWA alarm

If the siren fails during the alarm, only a visual DWA alarm is displayed. Here, the junction box electronics send a message across the K-CAN to the footwell module (FRM).

Cross-wise operation by means of lock barrel and remote control

The anti-theft alarm system (DWA) can be armed and disarmed using both the door lock (with integrated key in the remote control) and the remote control (= cross-wise operation).
Due to insurance regulations, cross-wise operation is excluded in some countries.
In the absence of cross-wise operation, the DWA can be armed with the integrated key via the door lock but not disarmed via the door lock. (On some national versions, the anti-theft alarm system is triggered when the door lock is used for unlocking.)
Disarming is only possible using the remote control.
The cross-wise operation function can be coded in the Car Access System (CAS).

Access authorisation (Passive Entry) via the luggage compartment lid (R56) or splitdoor (R55)

With Comfort Access, the luggage compartment can be opened without active use of the identification sensor. Condition: the identification sensor is a maximum of 1.5 metres away from the aerial in the rear bumper.
If there is an identification sensor in the luggage compartment on closing the luggage compartment lid or splitdoor (and no authorised identification sensor outside), the luggage compartment lid or splitdoor is opened again.
The attention of the user is drawn to the anti-theft alarm system as follows:

- visual signal (hazard warning lights)
- acoustic signal (siren, 3 double tones within approx. 2 seconds)

Notes for Service department

General information

Reading the alarm memory
The last 10 the DWA alarms are stored in the alarm memory of the alarm system control unit. For each alarm, the following supplementary information is also stored:

- Alarm trigger signal
- Date and time
- Outside temperature

National version

National version US

Panic mode
In the event of a threat from the outside or in the event of an accident, the panic mode can be used to attract the attention of others (DWA alarm).
The assignment of the remote control can be changed by coding.
The button for luggage compartment lid unlocking on the remote control then functions as the button for the panic mode. For this, the button for the panic mode must be pressed for 3 seconds.
The panic mode can be triggered independently of the DWA status (armed/disarmed). Pressing any button on the remote control terminates the panic mode.
The panic mode is not indicated by the DWA LEDs and/or the DWA LEDs do not change their current display status.
The alarm duration for the visual alarm in the panic mode is limited to 6 minutes.
The alarm duration for the acoustic alarm in the panic mode is unlimited (until the batteries are flat).