FUNCTION : NAC AUDIO-NAVIGATION

N.B. : (*) According to version.

1. Glossary

GPS: global positioning system.
RDS = Radio Data System.
TA : Traffic Announcement.
TMC: Traffic Message Channel.
DAB: Digital Audio Broadcasting.
LVDS : Low Voltage Differential Signalling.

2. Radio / CD / USB / jukebox / audio streaming functions (*)

Details of the functions :
- Radio function, select and store stations, activate and deactivate RDS, DAB, TA functions, traffic announcements, road information (*)
- Functions of the CD player (play, pause, stop, fast forward or rewind, track play order programming, etc.) (*)
- USB function (play, pause, stop, fast forward or rewind, track play order programming, etc.)
- Audio management (adjustment of the volume, balance, fader and tone, sound ambience, etc.)
- Management of the audio inputs
- TMC : Traffic Message Channel

N.B. : The volume of the audio system is adjusted automatically in relation to the vehicle speed (can be deactivated by the user).

2.1. Radio function

The NAC audio-navigation comprises 3 tuners which permit the following actions :
- Radio frequency reception
- Compilation and/or updating of the list of captured radio stations
- TMC information recovery

RDS = Radio Data System :
- The RDS function (on the FM waveband) enables the user to continue listening to the same station regardless of the frequency used by the station in the current location
- The audio system continuously searches for the transmitter which transmits the same programme with the best reception

TMC : Traffic Message Channel :
- The TMC is a service which broadcasts road traffic information
- RDS TMC messages are received which are transmitted automatically by a radio station which broadcasts TMC and displays them on the vehicle multifunction touch screen
- Filters by area, by route or by location are provided

N.B. : TMC functions can be activated/deactivated through the radio function (Filtering).

TA : Traffic Announcement :
- The TA function allows the user to receive traffic information
- This function automatically and temporarily switches to an FM station which is broadcasting this information (this station should manage the TA)

N.B. : The TA function remains active while the user is listening to a source other than the radio (CD, audio track

navigation, etc.).

Radio-text : RDS TMC messages are received which are transmitted automatically by a radio station which broadcasts TMC and displays them on the vehicle multifunction touch screen.
DAB: Digital Audio Broadcasting (*) :
- The DAB function is the digital radio which permits improved sound quality
- This function permits the displaying of visual information concerning the current details of the radio station selected or its logo

N.B. : The DAB / FM automatic station following enables the user to continue listening to the same station by temporarily switching to the corresponding analogue station until the digital signal becomes stable again.

2.2. Function : CD player (*)

The compact disc player plays audio CDs and CDs in the MP3 or WMA format (According to the trim level).
In CD mode, the audio system searches for specific recorded information on the CD (the song, the artist, the title) and displays it on the multifunction screen.

2.3. USB function

The USB function permits the playing of an audio file on a USB peripheral device.

N.B. : Audio files on a USB peripheral device can be played while using the navigation.

2.4. "JUKEBOX" function (*)

It is possible to copy an audio file to the NAC (Jukebox) radio navigation system internal memory via a USB peripheral device.
The Jukebox function cannot be reversed, audio files previously copied into the Jukebox cannot be transferred via a USB peripheral device.

N.B. : The CD player does not permit the transfer of audio files to the Jukebox.

2.5. "Audio streaming" function

Audio streaming allows the user to play and control audio files from a portable device, via Bluetooth.

3. Voice synthesiser function

Voice emission of the messages relating to the navigation function.

4. Video decoding

The NAC audio-navigation makes it possible to play different video format extensions by means of its video decoder

5. Video export (*)

The NAC audio-navigation makes it possible to export a video towards a second screen via an LVDS connection.

6. Management of personal audio lists (*)

The NAC audio-navigation incorporates the following management functions for personal audio lists :
- A table of contents recorded at the start of each audio CD, which allows conversion of audio CDs to MP3 or WMA format (depending on trim level) then storage in the jukebox
- A playlist with automatic media recognition : Use of an on-board or remote database for all media
- Voice recognition and voice synthesis
- Display of CD covers

N.B. : The voice synthesis function makes it possible to convert text into an audio file.

7. Protective functions of the NAC audio-navigation system

7.1. Theft protection

The VIN is recorded in the built-in systems interface and in the NAC audio-navigation.
The 2 VIN codes are compared when the ignition is switched on :
- If the 2 VINs are identical, the NAC audio-navigation operates normally
- If the 2 VINs are different, the NAC audio-navigation is operational but emits beeps continuously

N.B. : The beeps stop when you press the "OFF" button.

7.2. Heat protection

The NAC audio-navigation controls the telematic unit internal fan when an excessive internal temperature is detected (*).
The NAC audio-navigation reduces the volume when the temperature of its amplifier is excessive.
If the thermal protection is active, the sound volume cannot be increased.

8. Hands-free kit function (Via Bluetooth)

The NAC audio-navigation establishes a connection with the smartphone via a Bluetooth connection.

8.1. Emission of the voice from the vehicle transmitter

The outgoing audio signal is acquired by the vehicle's audio-navigation system microphone(s) and sent directly to the NAC audio-navigation system which processes and sends this signal to the smartphone via the Bluetooth connection.

8.2. Reception of the voice of the remote contact inside the vehicle

The incoming audio signal reaches the NAC audio-navigation via the Bluetooth connection.
The NAC audio-navigation decodes the digital signal then generates and formats the associated analogue audio signal which is amplified by the NAC audio-navigation internal audio amplifier before being sent to the vehicle's speakers.

9. Navigation aid / geographical position

9.1. Geographical location by GPS system

N.B. : GPS stands for "Global Positioning System".

The GPS system consists of satellites distributed around the Earth.
The satellites permanently transmit numerical signals at the speed of light, on 2 different frequencies.
At any moment, the system receives its position in relation to the visible satellites as well as the time at which the signal was sent.
The NAC audio-navigation thus deduces the position of the vehicle.

9.2. Location function

The NAC audio-navigation can locate the vehicle's position at any time if 3 satellites are present.
For the location function, the possible actions are :
- Real time display of vehicle position on the map
- Compass function (display of a compass on the screen)

N.B. : The road system that can be used by a vehicle and a set of points of interest are contained in the memory o the audio system (restaurants, garages, service stations, etc).

9.3. Guidance function

After destination and guidance criteria have been selected, the navigation system locates the vehicle in terms of the

map and then calculates the itinerary to be taken.

The NAC audio-navigation sends the guidance data to the multifunction (touch) screen.

For the navigation function, the possible actions are :
- Selection of a route
- Choice of route type
- Display of a route map
- Real time display of vehicle position on the map
- Display of changes of direction
- Storing of a location, address or current position in the main address book
- Display of due north and vehicle in the centre
- Zoom in on the map
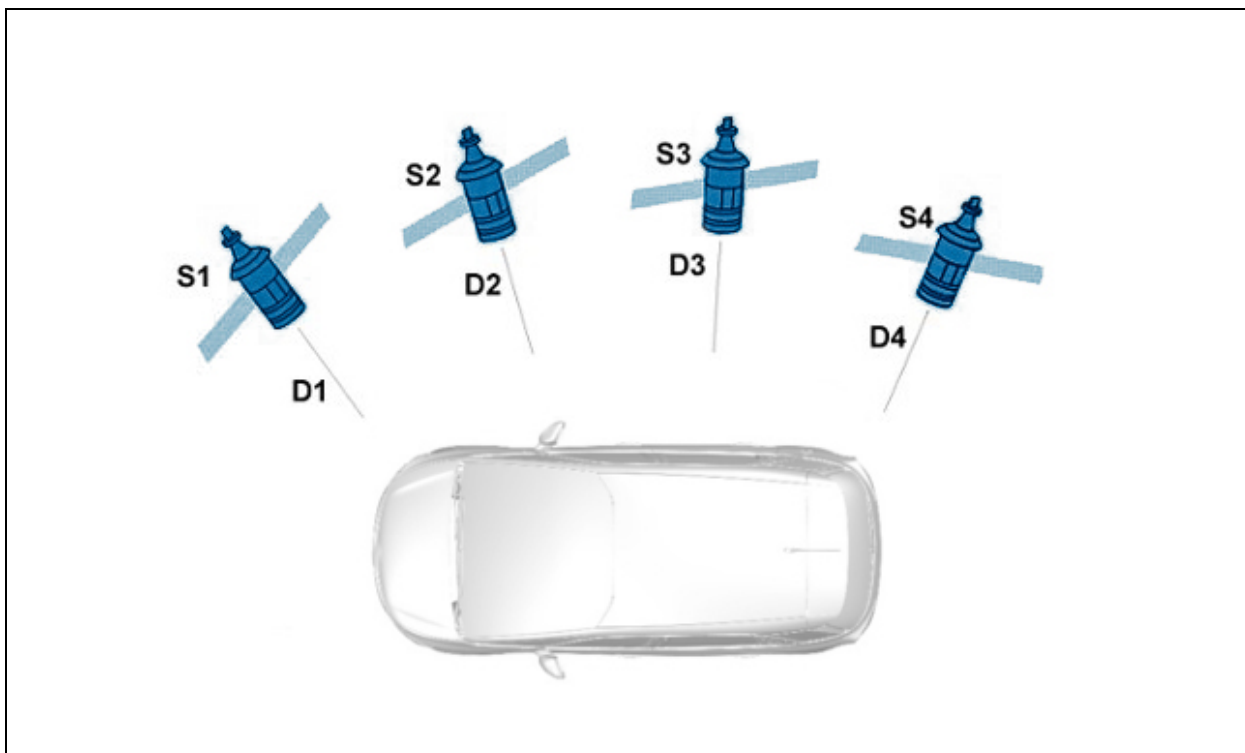- Warning of danger zones and fixed radars

Figure : D4EA70CD

Key :
- "S1" Satellite 1
- "S2" Satellite 2
- "S3" Satellite 3
- "S4" Satellite 4
- "D1" Distance between satellite 1 and the vehicle
- "D2" Distance between satellite 2 and the vehicle
- "D3" Distance between satellite 3 and the vehicle
- "D4" Distance between satellite 4 and the vehicle

9.4. System of navigation assistance

The on-board navigation system guides the driver towards the destination which they have fixed in accordance with a chosen route.

The on-board navigation system consists of the following components :
- The NAC audio-navigation incorporating a map of Europe (according to country) built into the memory of the audio system and a GPS module
- A touch screen
- A GPS aerial

N.B. : The NAC audio-navigation permits 3D navigation.

9.5. NAC audio-navigation (incorporating the navigation assistance/geographical location function)

The NAC audio-navigation first searches for the destination required by the user, then calculates the route and final provides the visual and spoken guidance instructions.

9.6. Connected navigation service

This service provides access to the following connected functions :

- Connected traffic information : This function informs the driver in real time of the traffic conditions on their route (accidents, road works, slow moving traffic, etc.)
- Hazardous areas (Vehicle speed check)
- Available parking spaces
- Fuel prices at service stations
- Search for points of interest on the internet
- Local weather

10. Aerials

The aerial system is the primary component of a radio reception system.
The aerial system converts a radiated electromagnetic wave into an electrical and magnetic transverse wave guided by a radio aerial cable to the radio tuner.
An aerial system comprises the following components :

- A wave collector suited to the type of signals to be received
- A connection cable permitting the passage of the signals between the wave collector and the aerial adaptor
- An aerial adaptor which transmits the signals received by the wave collector to the audio system cable

10.1. Radio aerial

The AM/FM/DAB aerials permit reception of audio broadcasting transmissions in amplitude modulation and frequency modulation inside the vehicle (*).

N.B. : The outgoing signal from the AM/FM aerial is subdivided into 2 AM/FM1 and FM2 signals ; Using a splitter.

10.2. GPS aerial

The aerial enables reception of the GPS signals.

11. Connection to Internet

11.1. Bluetooth

The NAC audio-navigation permits connection to the internet via Bluetooth.

11.2. Wi-Fi (*)

The NAC audio-navigation can connect to the internet via a Wi-Fi access point.

11.3. Wi-Fi on board function (*)

The NAC audio-navigation can act as a Wi-Fi access point which allows users of mobile devices to connect to the internet in the vehicle.

12. Connectivity with Android and iOS smartphones

N.B. : Android smartphones can be connected via Bluetooth or USB.

N.B. : IOS smartphones can only be connected via USB cable.

12.1. Screen copy or "mirroring" function (**) (*)

The screen copy or "mirroring" function permits duplication of the multimedia and application content of a compatible smartphone in order to control it directly from the NAC audio-navigation multifunction (touch) screen.

N.B. : (**) The screen copy or "mirroring" function is called "Mirror Link" for "Android" smartphones or "Carplay" for "iOS" smartphones.

12.2. "SMARTAPPS" function

The "Smartapps" function permits the transmission of information about the condition and use of the vehicle to a smartphone.
The information about the journey is transmitted to the smartphone when the vehicle stops :
- Vehicle location
- Destination of the vehicle
- Service indicator
- fuel consumption
- Warnings

N.B. : If the journey data could not be transmitted, it is recorded in the NAC audio-navigation and sent at the next connection.

12.3. Voice recognition function

The voice recognition allows you to carry out actions without taking your eyes off the road, improving safety at the wheel while still benefiting from the functions of the NAC audio-navigation.

12.3.1. Smartphone voice recognition function (*)

The NAC audio-navigation permits use of the voice recognition of the connected smartphone ; Using the vehicle's audio-navigation microphone.

12.3.2. On board voice recognition function

The on-board voice recognition permits the following actions :
- Searching for a point of interest
- Sending of an SMS or e-mail

The user can activate the on-board voice recognition via the steering wheel controls or via the multifunction (touch) screen.
The vehicle informs the customer of the start of the dictation via a visual and audible indication to state their request.

N.B. : If the on-board voice recognition hesitates between several interpretations, it returns a list and invites the user to select a request from the results offered.

12.4. Sharing navigation data

The NAC audio-navigation allows the user to share navigation data with the contacts on their smartphone.
The navigation data which can be shared is :
- The destination
- The points of interest
- The estimated time of arrival
- The route

The navigation data can be sent by SMS, by e-mail or via a social network.

12.4.1. Private mode

The NAC audio-navigation has a private mode function which permits activation or deactivation of the collection and transmission of personal data (geolocation, etc.).
The private mode allows the user to specify restrictions on the use of personal data.
The private mode can be activated and deactivated in 2 different ways :

- In the vehicle via the multifunction (touch) screen
- Outside the vehicle via a personal space

Any change to the configuration of the private mode is sent automatically to the personal space of the owner of the vehicle.

N.B. : If the vehicle is declared stolen, the user can no longer access the private mode service.

12.4.2. Sharing navigation data with other users

The NAC audio-navigation allows the user to send navigation data to one or more recipients via their smartphone or via their vehicle's multifunction (touch) screen.
The user requests sharing of the navigation data in the form of an SMS or pre-formatted e-mail.
The NAC audio-navigation asks the user to select a recipient from the contacts on their list of contacts. The user can also enter a recipient manually or via the voice recognition if the recipient is not on the list of contacts.

N.B. : If connectivity is not established, the user is informed and is invited to try sending again.

The recipient can use the navigation data shared via their smartphone or via the multifunction (touch) screen of their vehicle.

12.4.3. Sharing navigation data on a social network

The NAC audio-navigation allows the user to share navigation data on their social network.
The user requests sharing of the navigation data on one of their social networks associated with their smartphone.
Once the navigation data has been shared, the user can use it directly on their social network.

12.4.4. Real time position sharing

The real time position sharing allows the user to share their position with one or more recipients.
The driver requests sharing of his moving position in a URL link via an SMS or an e-mail.

N.B. : If the private mode is activated, the NAC audio-navigation invites the driver to deactivate it if they wish to share their position in real time.

The NAC audio-navigation asks the user to select a recipient from the contacts on their list of contacts. The user can also enter a recipient manually or via the voice recognition if the recipient is not on the list of contacts.

N.B. : If connectivity is not established, an error message is sent to the user.

The recipients can follow the position of the driver in real time via their smartphone or via the multifunction screen of their vehicle.
The sharing ends if the driver :
- Stops the real time position sharing
- Activates the private mode
- Reaches their destination
- Deactivates the NAC audio-navigation

13. Digital engine sound (*)

The digital engine sound function allows a sound ambience to be created by playing an artificial sound of the engine via the speakers.
The NAC audio-navigation plays the acoustic engine ambience through the speakers according to :
- The vehicle speed
- The driver's wishes
- Engine rpm

14. Activation/deactivation condition

14.1. Activation

The NAC audio-navigation is activated in the following cases :
- By pressing the activation/deactivation button on the NAC audio-navigation upper multifunction control panel
- By triggering of the CAN

14.2. Deactivation

The NAC audio-navigation is deactivated in the following cases :
- By pressing the activation/deactivation button on the NAC audio-navigation upper multifunction control panel
- By a change to energy economy mode
- By the CAN cutting off or going to sleep