twisted pair circuits. The final output by the ACM and the DSP is sent as fluctuating AC voltage to the speakers.

Remote Audio Controls

The audio system steering wheel switches contain a series of resistors. Each steering wheel audio function switch has a specific resistance value. The SCCM and switch assembly are connected in a voltage divider circuit. The voltage drop over an internal SCCM resistor is changed by the different audio switch function resistances. The SCCM monitors the resultant voltage drop across its internal resistor to determine which steering wheel switch is pressed. The SCCM transmits the steering wheel switch inputs over the CAN to the ACM, to control audio functions.

SYNC System

NOTE: *Refer to the Owner Literature for additional details of the SYNC system.*

The APIM contains the SYNC software. The SYNC system connects various inputs over Bluetooth or USB connections to the car audio system. The SYNC system allows driver control of a phone, media device, and vehicle systems (for example, navigation, climate control).

The APIM is powered at all times and uses the BCM ignition status message to control the on/off mode. The accessory delay feature is controlled by an ignition status message from the BCM.

SYNC Inputs

- USB - media players or flash drives
- Bluetooth - phones or media players
- Display unit and FCIM inputs or panel switches
- Steering wheel switches
- Voice microphone input
- GPS data
- Satellite SDL wired input from the ACM

SYNC Outputs

- Display unit (touchscreen (FDIM) or non-touchscreen (FCDIM)) CAN messages
- HVAC commands (touchscreen-equipped only) CAN messages
- Hard wired stereo and monaural outputs to the ACM
    - Stereo (2 channel) audio
    - Monaural voice command responses, including navigation guidance (if equipped)
    - Monaural phone call audio and phone ringtone
- Commands to a USB or Bluetooth device
    - Outgoing call commands
    - TTS information for a phone
    - USB device file selection for playback

Remote SYNC Controls

The SYNC steering wheel switches contain a series of resistors. Each steering wheel audio function switch has a specific resistance value. The SCCM and switch assembly are connected in a voltage divider circuit. The voltage drop over an internal SCCM resistor is changed by the different audio switch function resistances. The SCCM monitors the resultant voltage drop across its internal resistor to determine which steering wheel switch is pressed.

The SCCM transmits the steering wheel switch inputs over the CAN to the APIM, to control SYNC functions.

Bluetooth Mode

The APIM supports multiple Bluetooth profiles, allowing the SYNC system to interact with both Bluetooth-enabled phones and Bluetooth-enabled media devices.

USB Mode

The APIM receives serial data input from connected USB devices. The USB cables to the APIM are shielded to prevent interference from electromagnetic sources. The APIM provides 5 volt power for USB single ports.

Voice Commands

When the steering wheel voice button is pressed, the SCCM sends a message to the APIM over the CAN indicating the request to initiate voice commands.

When voice commands are spoken, the monitored sounds are converted into analog signals by the microphone and sent to the APIM. The APIM software interprets them and outputs a command.

Compass

The GPS antenna (integrated with the satellite radio antenna) is used to acquire the compass heading.

The compass data is sent through the GPS cable to the APIM. The APIM uses this data, in addition to wheel speed and wheel rotation direction messages from the ABS module, to calculate and provide accurate vehicle tracking. The APIM processes the data and transmits it to the display unit through the LVDS cable. In the event the GPS fix or signal is temporarily lost, the APIM continues to use the vehicle tracking CAN messages from the ABS module to maintain compass accuracy.

Navigation (if equipped)

The APIM receives GPS data from the satellite and GPS antenna via the coaxial cable. The GPS data is used for the compass, vehicle location (in the event of airbag deployment) and navigation guidance. The APIM uses the GPS data along with ABS module wheel speed and rotation direction to provide accurate navigation tracking. In situations where the GPS signal is temporarily lost, the APIM continues to use the ABS module and vehicle acceleration data to continue vehicle tracking.

The navigation map data is stored in the APIM. The APIM processes the data and transmits it to the display unit through the LVDS cable.

SIRIUS™ Travel Link™

The SIRIUS™ Travel Link™ is a subscription-based service available on vehicles equipped with navigation. The satellite radio antenna receives digital signals containing Travel Link™ data. These signals are routed to the satellite radio receiver (integral to the ACM) from a splitter that is part of the GPS antenna coaxial cable. The satellite receiver decrypts the data and the ACM sends it through wired circuits to the APIM.

Certain date-dependent features (such as sports schedules and scores, movie times, or the 5-day weather forecast) require the use of GPS data for accuracy. The APIM processes the data from the ACM and sends it to the display unit. The time intervals for each Travel Link category to update the data vary, depending on the category.

SYNC Connect (if equipped)

The SYNC Connect system uses the TCU to communicate via the cellular network with a device running the SYNC Connect application. The TCU communicates with other vehicle modules over the CAN to obtain information or to carry out application commands, depending on the request.

The primary means of communication between the TCU and the cellular network uses a cellular antenna located between the rear bumper and body. A separate coaxial cable connects the cellular portion of the antenna to the TCU. The secondary means of communication between the TCU and the cellular network is the TCU antenna. The TCU antenna connects to the TCU via a coaxial cable.

SYNC Connect data is transmitted via the cellular network to a server or customer device with the SYNC Connect application installed. The data received via the cellular network from the device application is processed by the TCU, which can make vehicle system commands via the CAN.

Vehicle Wi-Fi Hotspot (if equipped)

The TCU provides the vehicle Wi-Fi access point.

The TCU communicates to the cellular network by two means. The primary connection is through the cable to the cellular antenna incorporated into the GPS/Satellite antenna. The secondary means is through the cable to the TCU antenna.

Component Description

Audio Unit Antenna - Coupe

The coupe audio unit antenna is integrated into the rear window. It receives AM/ FM radio waves and sends them through a coaxial cable to the audio unit antenna amplifier.

Audio Unit Antenna Amplifier - Coupe

The coupe audio unit antenna amplifier amplifies AM/ FM radio signals from the rear glass antenna to improve reception. The amplified signal is sent through the AM/ FM antenna coaxial cable to the ACM. The ACM provides 12 volt power for the amplifier.

Audio Unit Antenna and Amplifier- Convertible

The convertible audio unit mast antenna with integrated amplifier is mounted to the right quarter panel. It receives AM/ FM radio waves, amplifies the signal, and sends it through the AM/ FM antenna coaxial cable to the ACM. The ACM provides 12 volt power for the amplifier.

FM2 Diversity Antenna

The FM2 diversity antenna is located between the left quarter panel and the rear bumper cover. It receives FM radio waves. It utilizes an antenna amplifier to compensate for FM signal strength loss as the radio waves are transmitted from the antenna to the ACM.

If the ACM is equipped with DAB capability, the FM2 diversity antenna also contains a DAB antenna.

FM2 Diversity Antenna Amplifier

The FM2 diversity antenna amplifier amplifies FM radio signals to improve reception. The amplified signal is sent through a coaxial cable to the ACM.

GPS/Satellite Radio Antenna

The satellite radio antenna receives GPS and satellite radio signals. The signals are sent through the coaxial cable and splitter (part of the coaxial cable assembly). The splitter is used only on vehicles with GPS/satellite antennas, to separate and distribute the signal to the APIM (GPS data) and the ACM (satellite radio data).

TCU Antenna

The TCU antenna is used to boost reception for incoming and outgoing cellular network data. It is a compact, cellular phone type, planar inverted-F antenna.

Cellular Antennas

Two cellular antennas are used. The LH and RH antennas are positioned between the respective quarter panel and the rear bumper cover. They receive the radio waves containing cellular data. The signals are sent through the cellular antenna coaxial cables to a splitter (or combiner) and then to the TCU.

Voice Microphone

The voice microphone is connected to the APIM.

ANC Microphones

The ANC microphones are connected to the DACMC, integrated into the ACM.

Steering Wheel Switches

The audio/SYNC system steering wheel switches contain a series of resistors. Each steering wheel audio function switch has a specific resistance value. The SCCM and switch assembly are connected in a voltage divider circuit.

Media Hub

The media hub contains a single, illuminated USB port and connects by a cable to a second, remote USB port. The media hub is powered by 12 volts from the APIM and has an internal power supply which provides 5 volts for the media hub port and the remote USB port.

Each port has two circuit connections for the 5 volt power, and two more circuits for digital serial data. Data from each USB port is switched in the media hub and sent to the APIM through a single USB cable.

LVDS Cable

The four-circuit, shielded LVDS cable uses two circuits to provide power and ground from the APIM to the display unit. Two more shielded circuits transmit display data between the APIM and the displays.

Display Unit

The APIM and the display unit exchange information via the LVDS cable. The APIM can communicate bezel test requests, display switch status, and display Diagnostic Trouble Codes (DTCs) over the CAN. The APIM provides the display with power and ground through the LVDS cable. The display does not communicate over the CAN.

FCIM

The control or switch functions of the FCIM are primarily climate control related.

The FCIM requires PMI when it is replaced.

ACM

The ACM, commonly known as the radio, is a separate module containing an AM/ FM tuner, satellite receiver (if equipped), CD player (if equipped), input interface (for example, SYNC inputs), and an audio amplifier.

If equipped with ANC, the ACM contains the DACMC. The DACMC performs noise canceling to reduce cabin noise.

The ACM and if equipped, the DACMC, both require separate PMI procedures when the ACM is replaced.

DSP

The DSP is a power amplifier for the vehicle speakers. The audio input signal comes from the ACM via 4 twisted-pair circuits . It may drive all speakers on a vehicle or share the speaker output with the ACM.

The DSP requires PMI when it is replaced.

TCU

The TCU is a radio transceiver which connects the vehicle to a cellular network. It is connected to the CAN for exchanging data and commands with other modules. It contains a non-serviceable SIM card. The TCU is assigned to the VIN of the vehicle and will not work in another vehicle.

The TCU requires PMI when it is replaced.

APIM

The APIM consists of two internal modules: the CIP and the VIP. The modules are not replaceable individually, but can be programmed independently.

The CIP connects to user devices via Bluetooth, USB, or Wi-Fi.

The VIP provides vehicle information for the CIP and other SYNC Apps or functions. In addition, the VIP queries the modules on the network for Diagnostic Trouble Codes (DTCs) when a vehicle health report is requested.

APIM Programming

The APIM requires PMI when it is replaced.

The APIM CIP or VIP software can be updated. When directed by Ford service, the VIP programming is done via the CAN using a diagnostic scan tool.

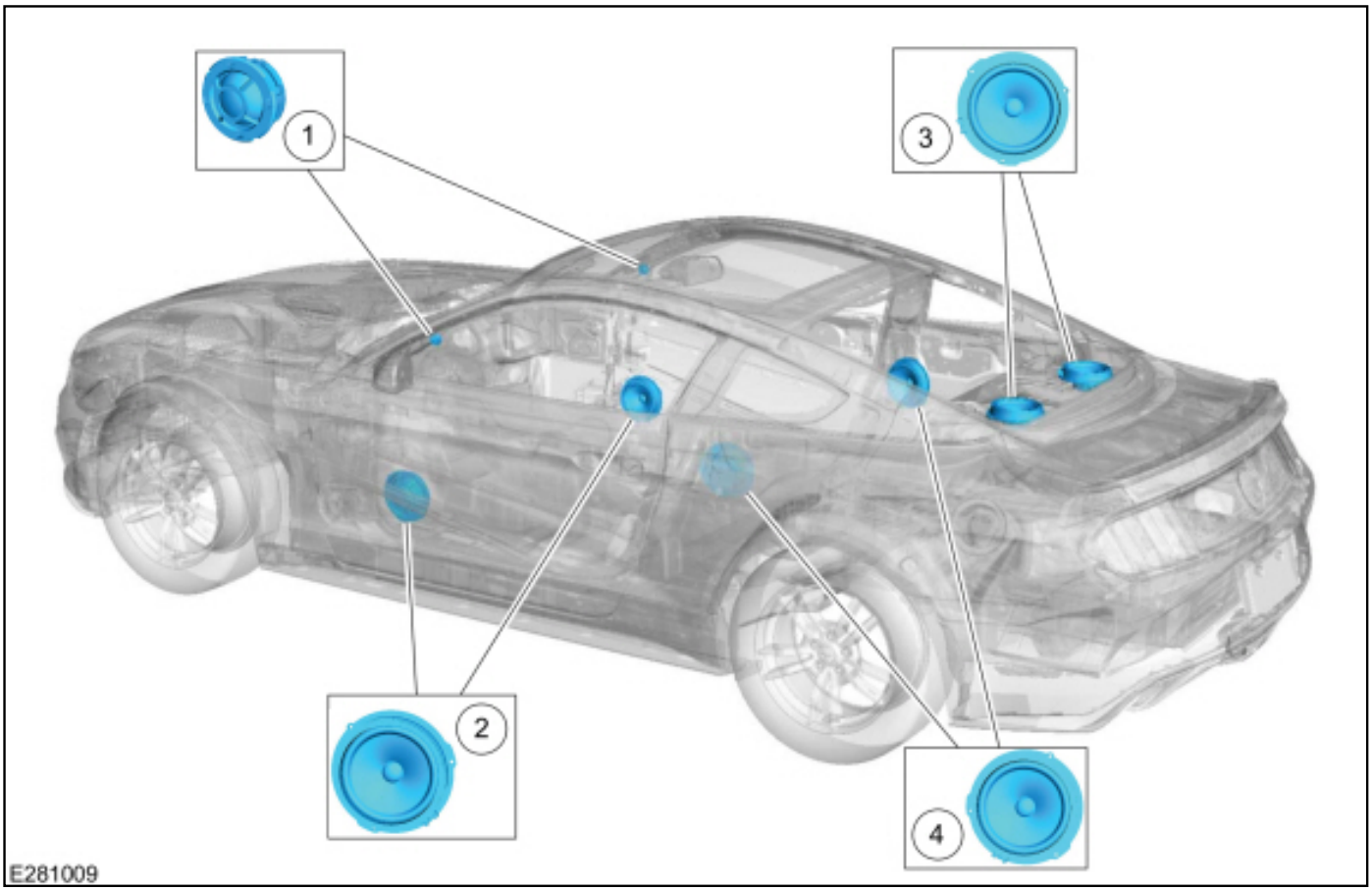
The CIP programming may be done using the diagnostic scan tool or Wi-Fi.

Information and Entertainment System - Component Location

NOTE: *The available speaker configurations are shown first. The remaining hidden audio/SYNC system components and various cable routings follow the speaker configurations.*

NOTE: *Some vehicles may not be equipped with all the optional components shown.*

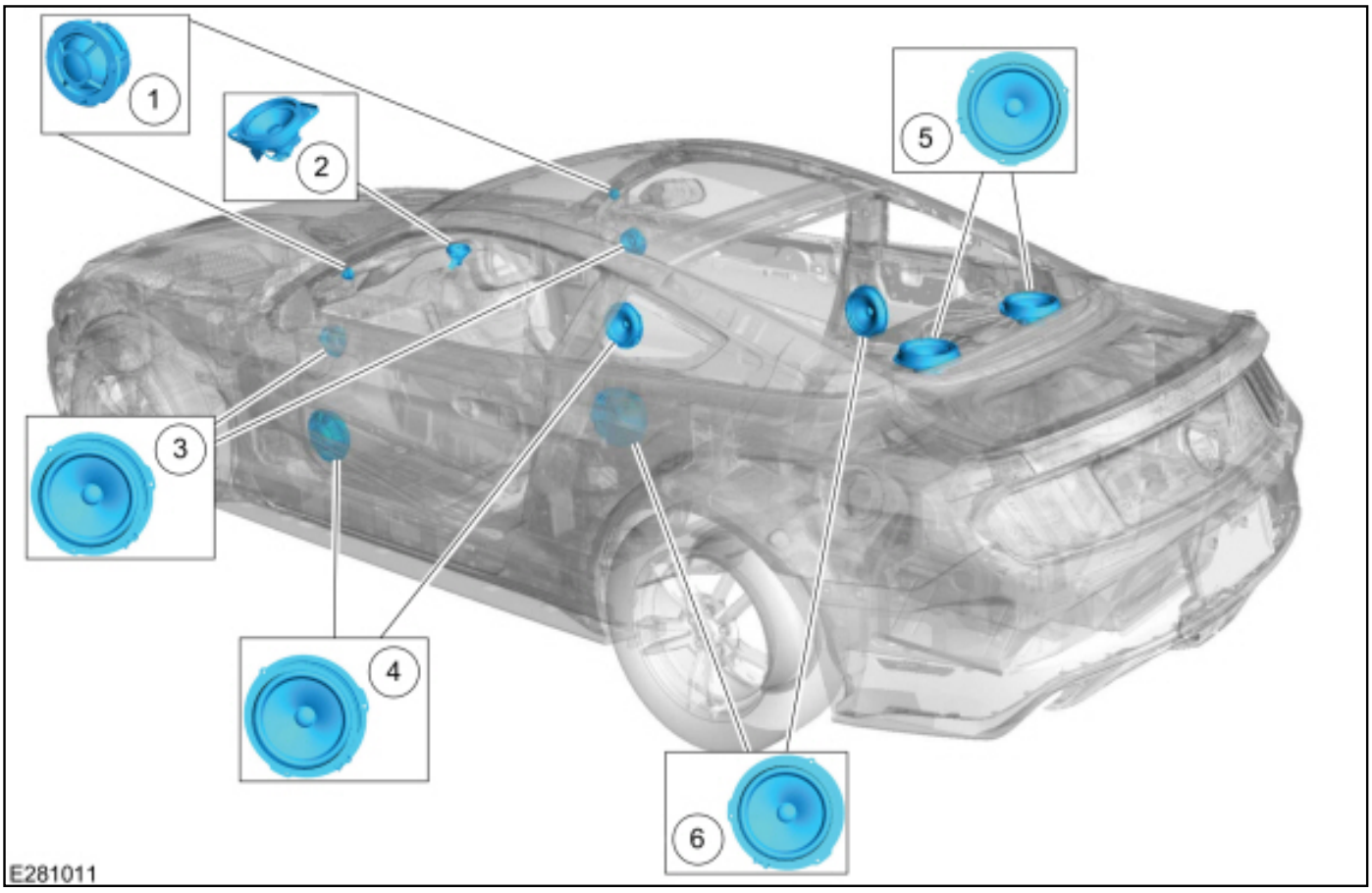
6 Speaker System



Item	Description
1	A-pillar tweeter speakers
2	Front door woofer speakers
3	Rear speakers (coupe)

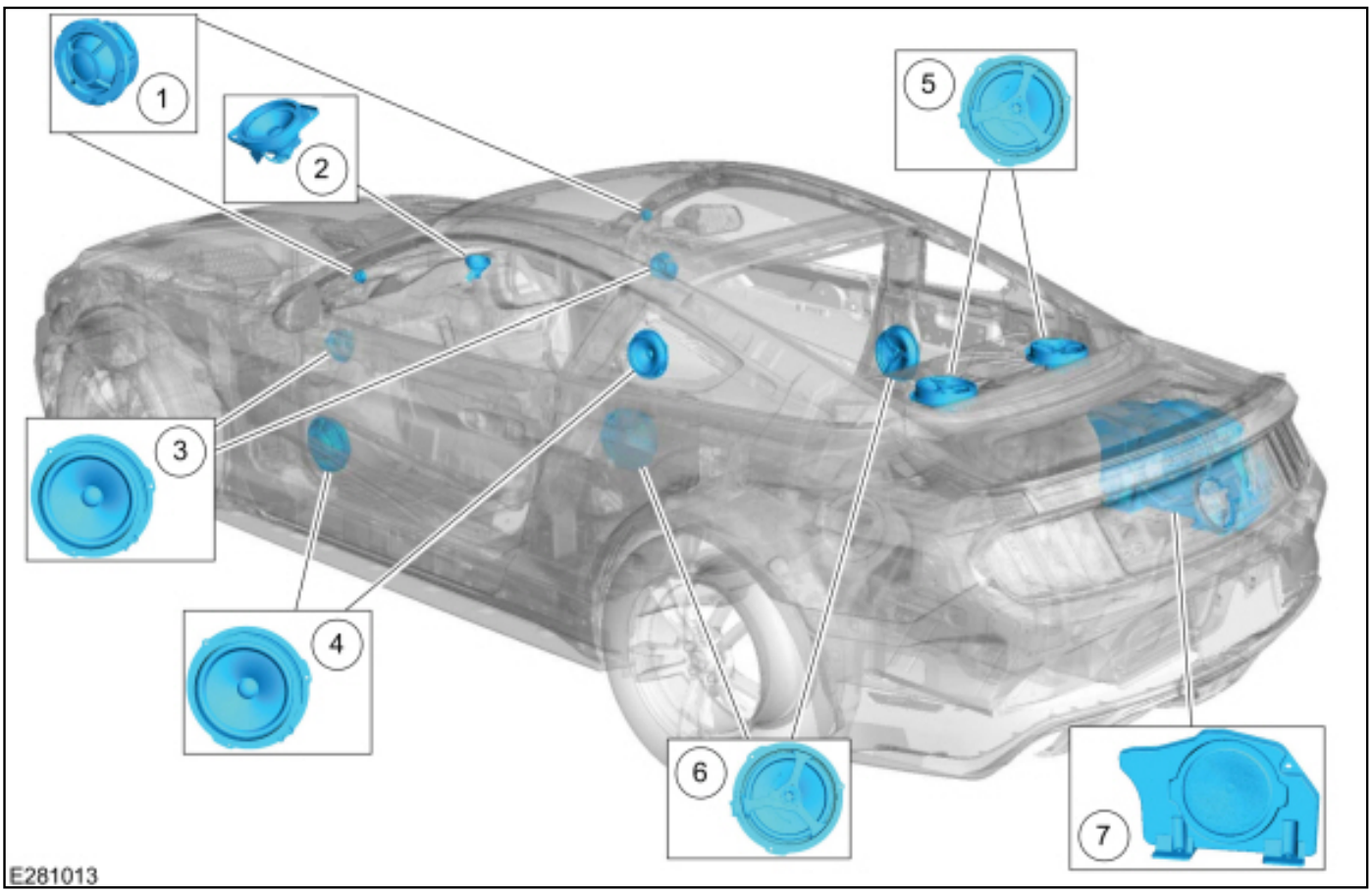
4	Rear speakers (convertible)

9 Speaker System



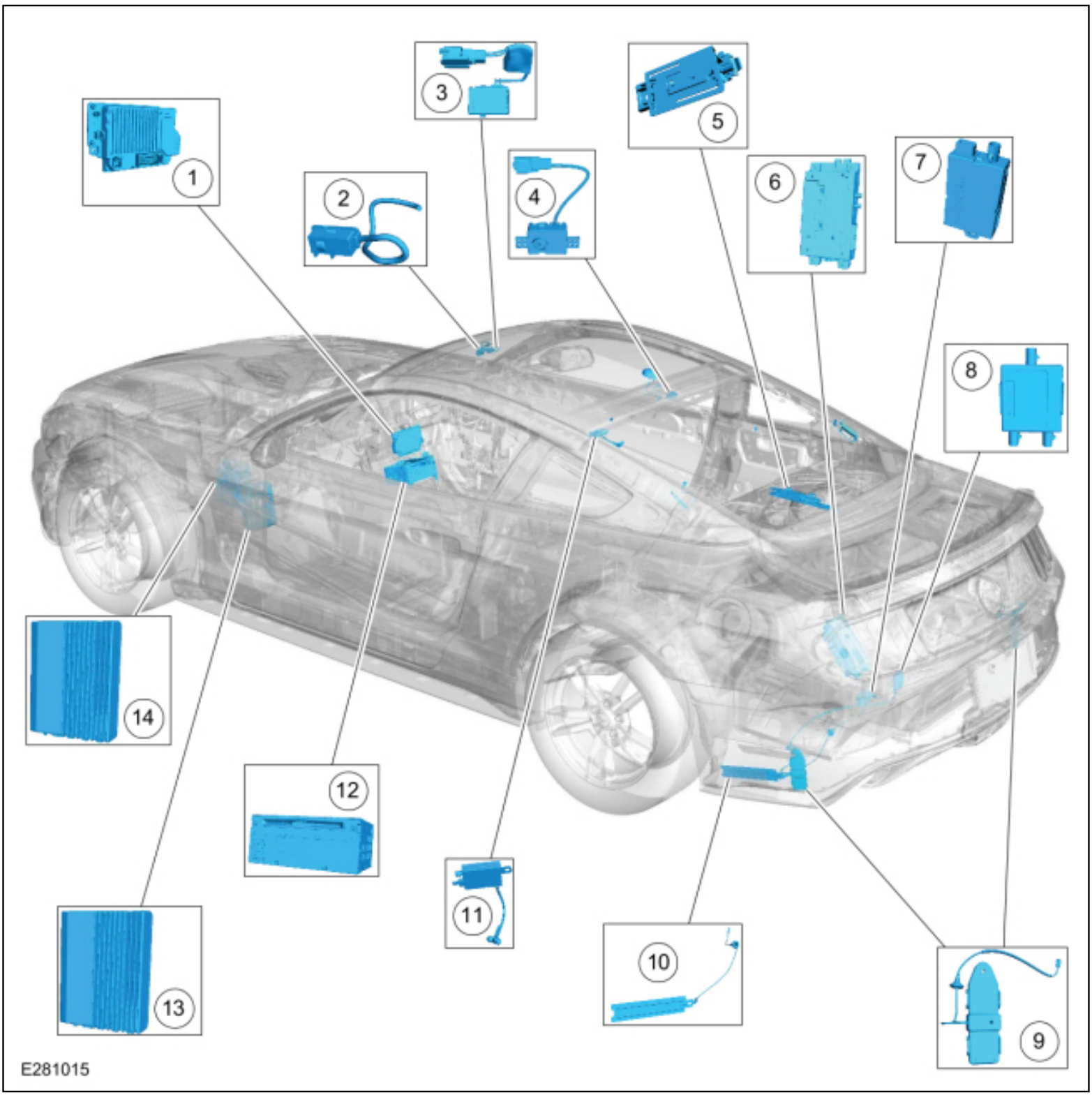
Item	Description
1	A-pillar tweeter speakers
2	Instrument panel center speaker
3	Front door midrange speakers
4	Front door woofer speakers
5	Rear speakers (coupe)
6	Rear speakers (convertible)

12 Speaker System



Item	Description
1	A-pillar tweeter speakers
2	Instrument panel center speaker
3	Front door midrange speakers
4	Front door woofer speakers
5	Rear coaxial speakers (coupe) (counted as 2 speakers each)
6	Rear coaxial speakers (convertible) (counted as 2 speakers each)
7	Subwoofer speaker

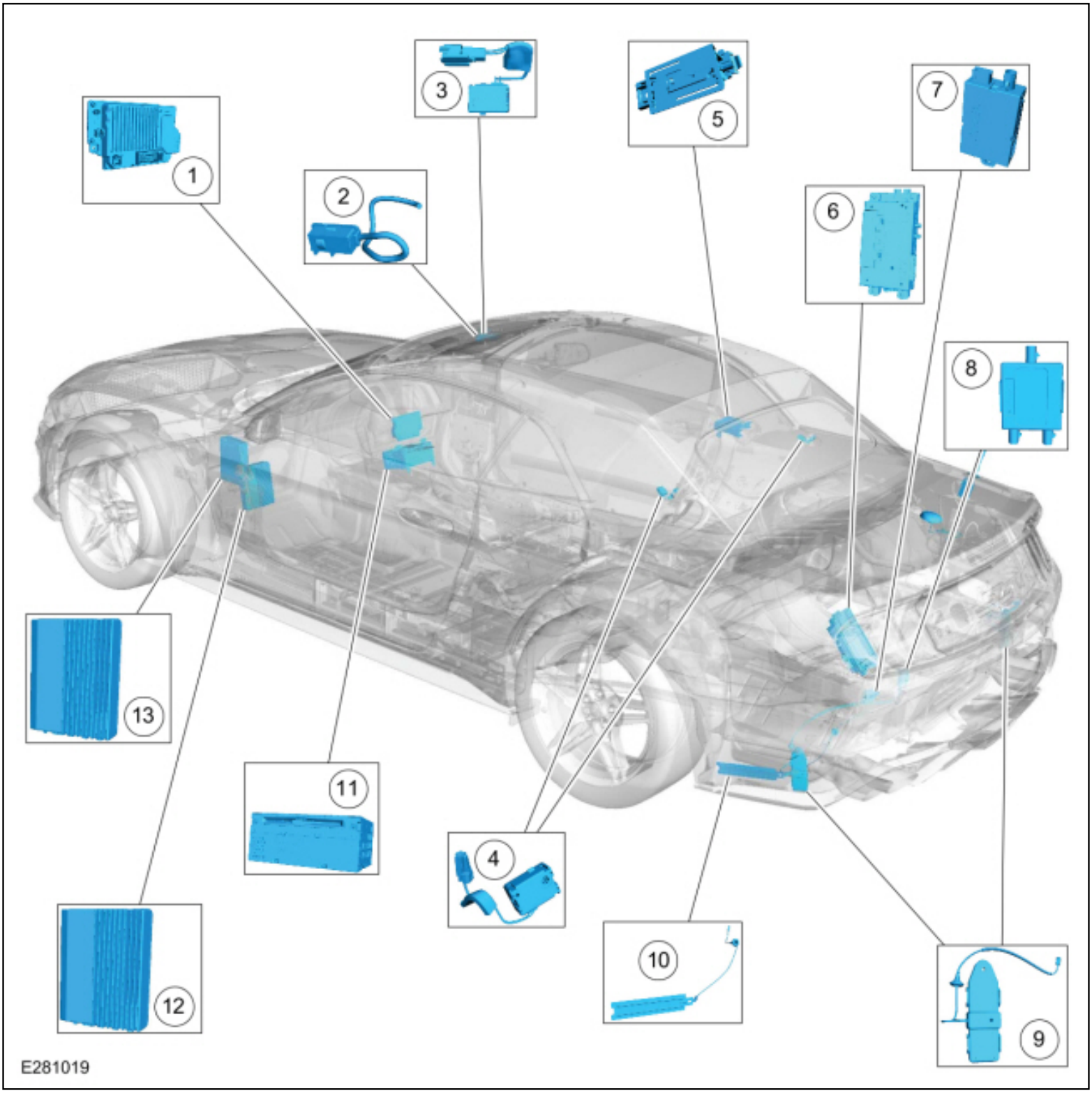
Audio/SYNC System Main Components - Coupe

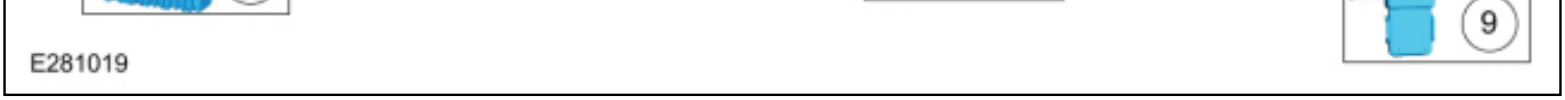


Item	Description
1	APIM
2	Voice microphone
3	Front ANC microphone
4	Rear ANC microphone
5	TCU antenna
6	TCU
7	FM2 diversity antenna amplifier (if equipped)

8	Cellular antenna cable splitter
9	Cellular antennas
10	FM2 diversity antenna
11	AM/ FM1 antenna amplifier
12	ACM
13	DSP (RH drive vehicles)
14	DSP (LH drive vehicles)

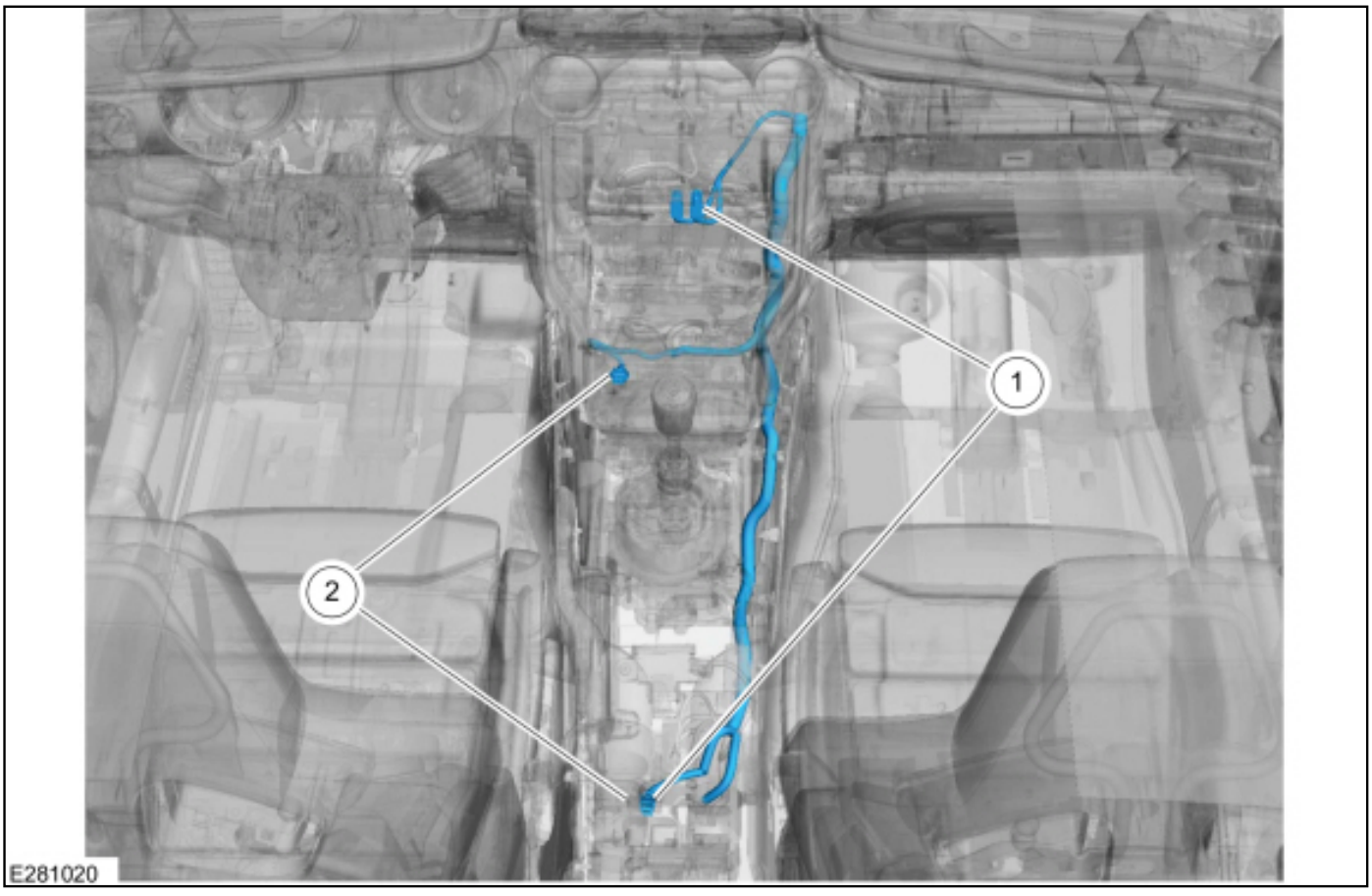
Audio/SYNC System Main Components - Convertible





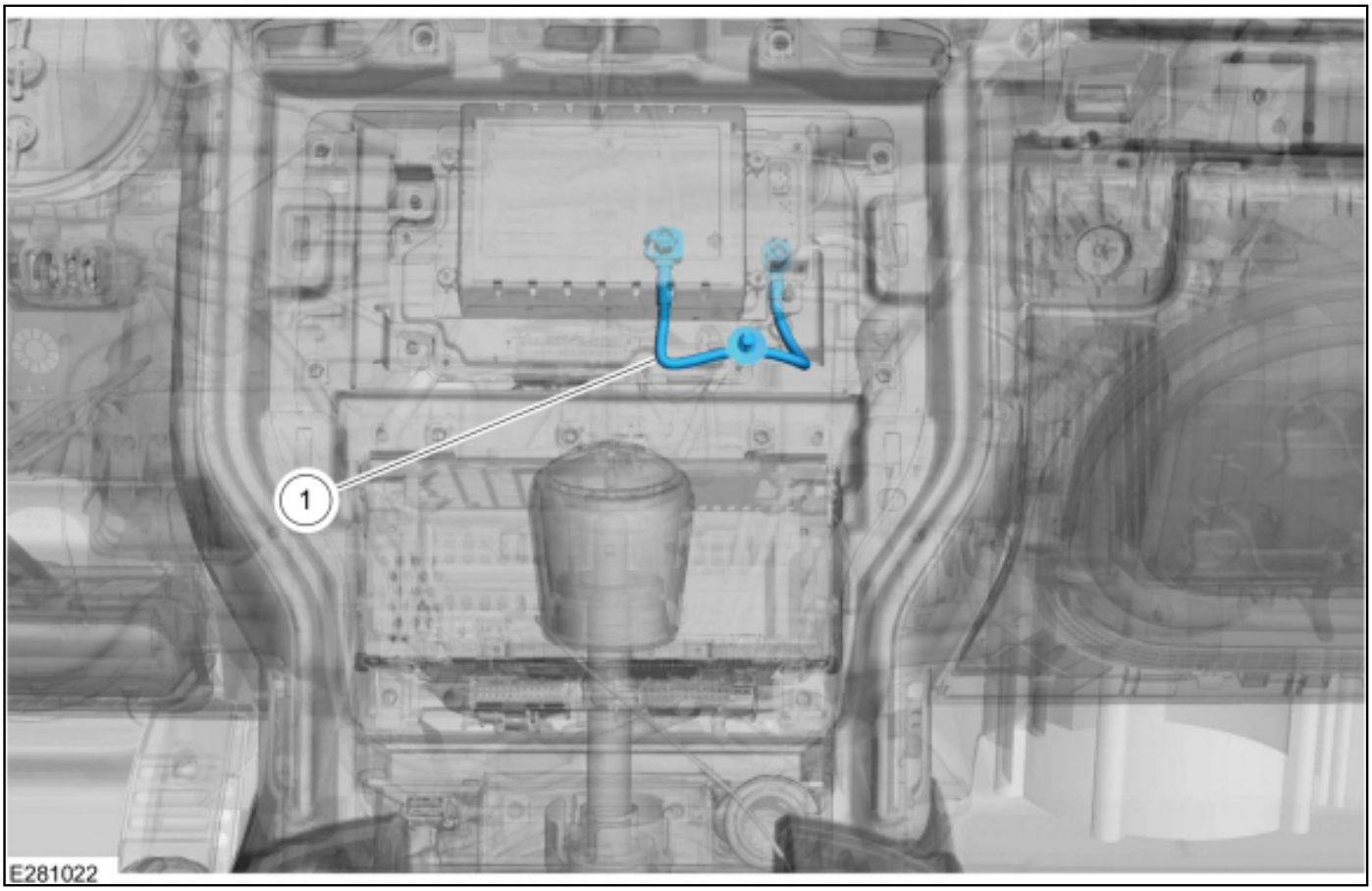
Item	Description
1	APIM
2	Voice microphone
3	Front ANC microphone
4	Rear ANC microphones
5	TCU antenna
6	TCU
7	FM2 diversity antenna amplifier (if equipped)
8	Cellular antenna cable splitter
9	Cellular antennas
10	FM2 diversity antenna
11	ACM
12	DSP (RH drive vehicles)
13	DSP (LH drive vehicles)

USB Cable Routing



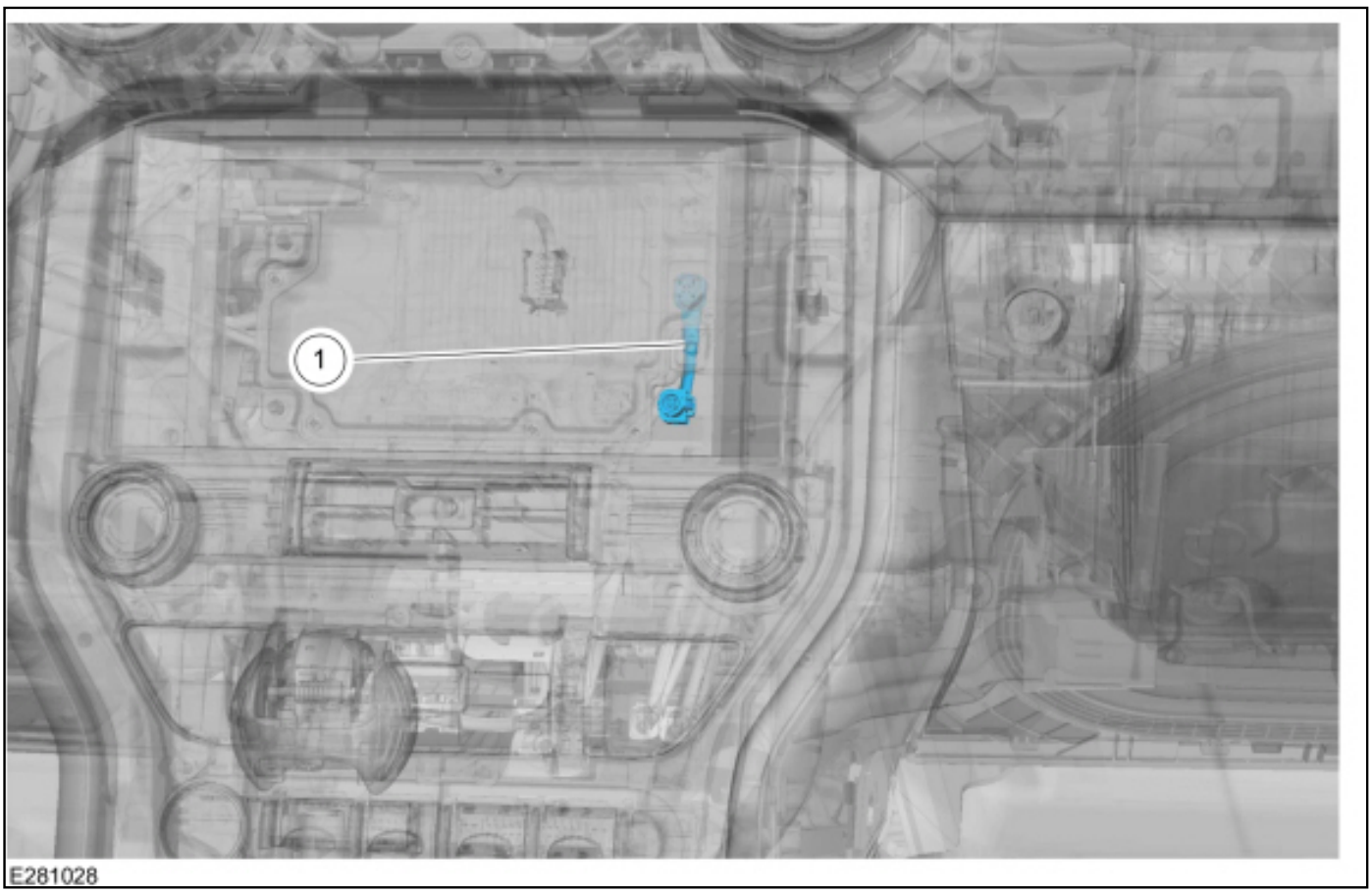
Item	Description
1	Front USB cable
2	Rear USB cable

Non-Touchscreen LVDS Cable Routing



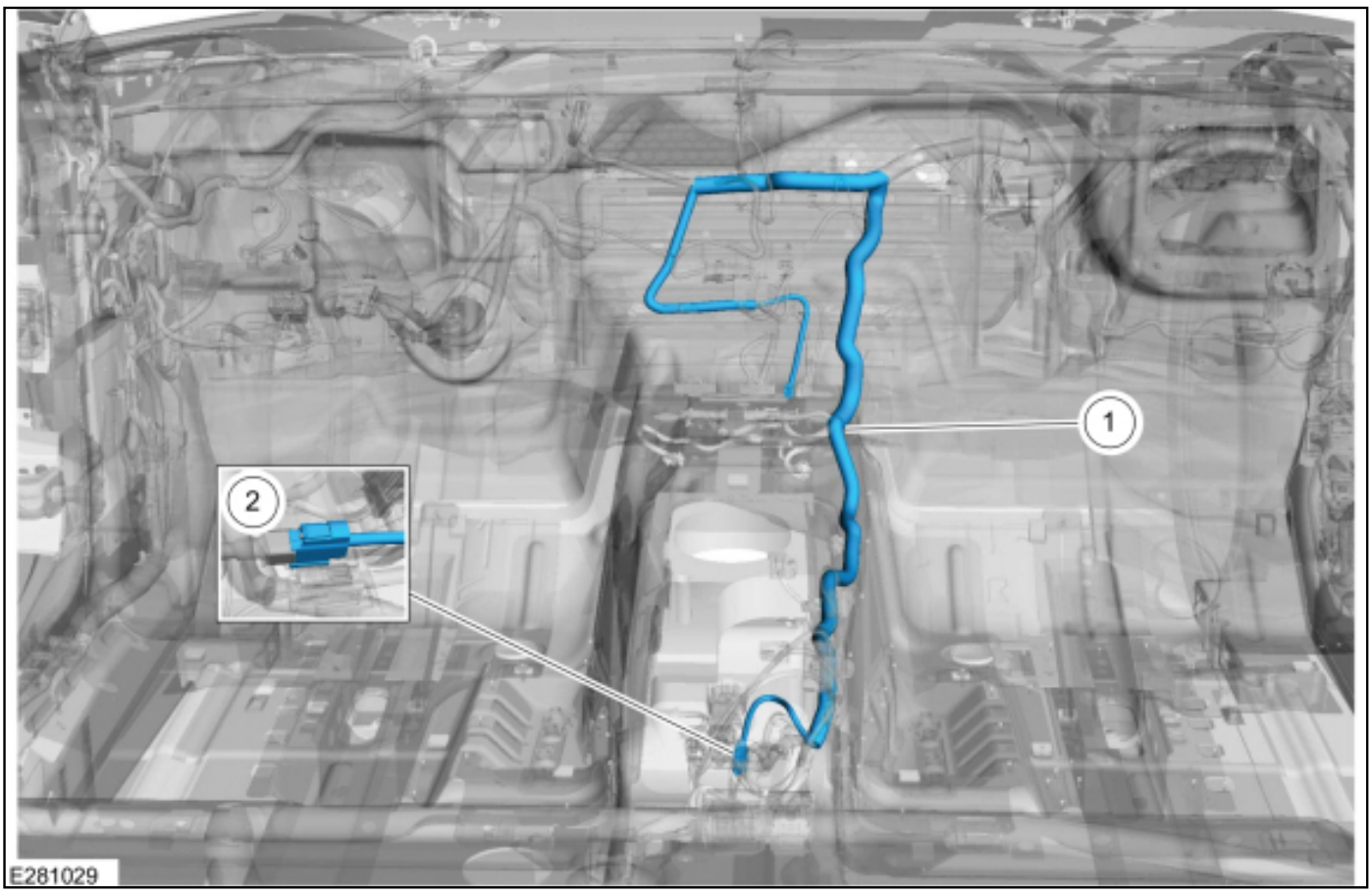
Item	Description
1	LVDS cable

Touchscreen LVDS Cable Routing



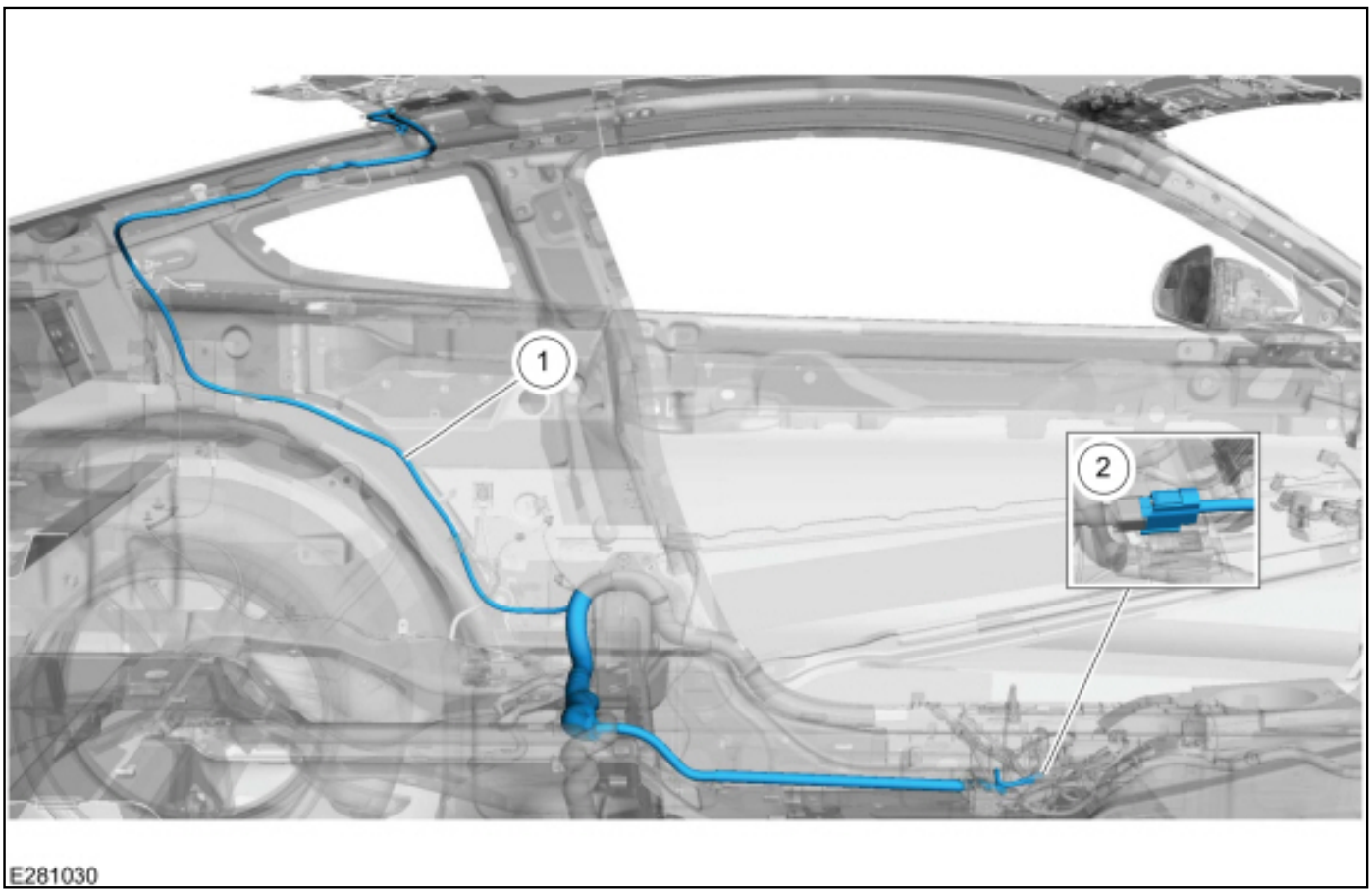
Item	Description
1	LVDS cable

Front Audio Unit (AM/ FM1) Antenna Cable Routing



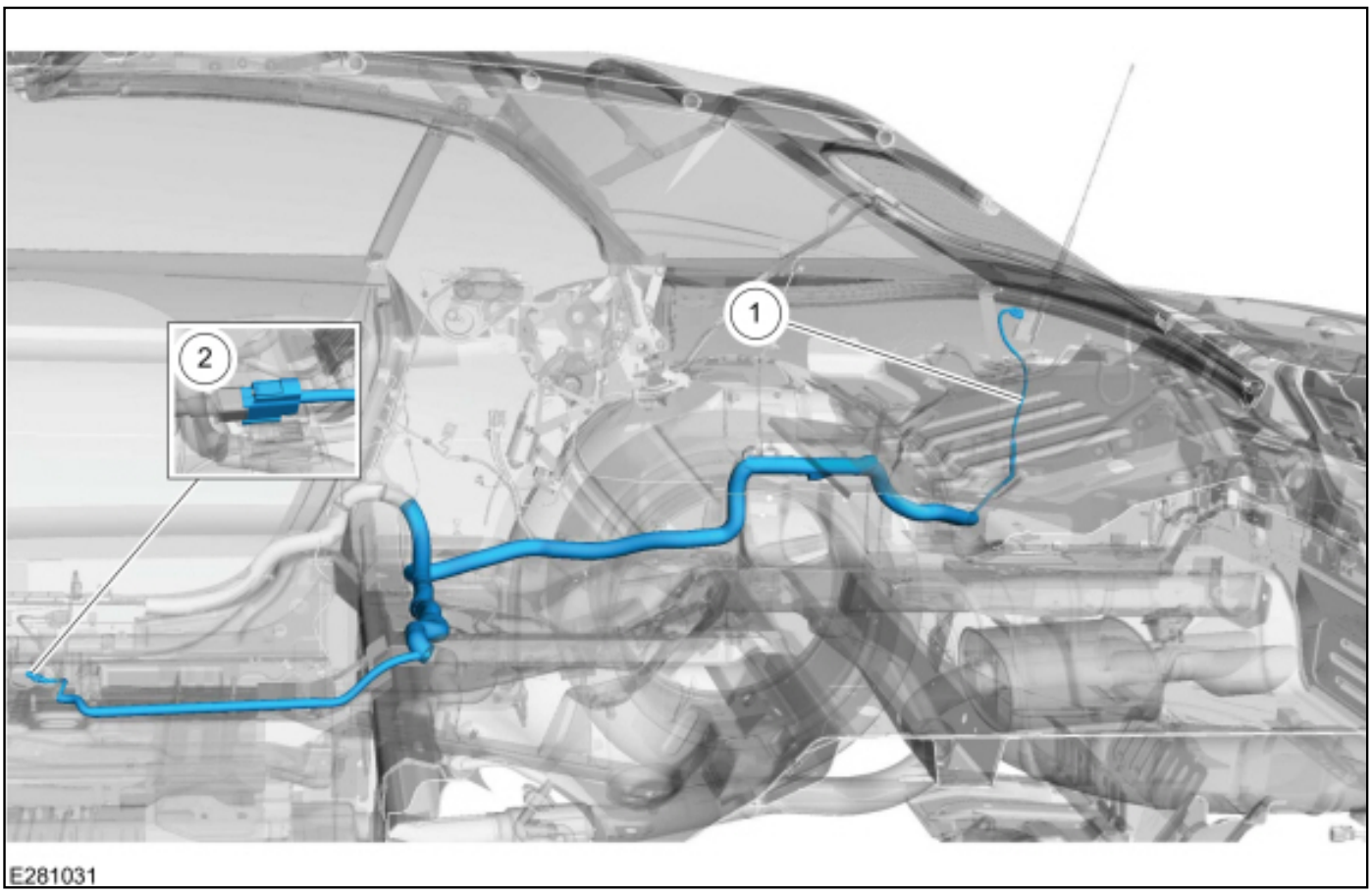
Item	Description
1	Front audio unit antenna cable
2	Audio unit antenna cable in-line connection (located under the floor console)

Rear Audio Unit (AM/ FM1) Antenna Cable Routing (Coupe)



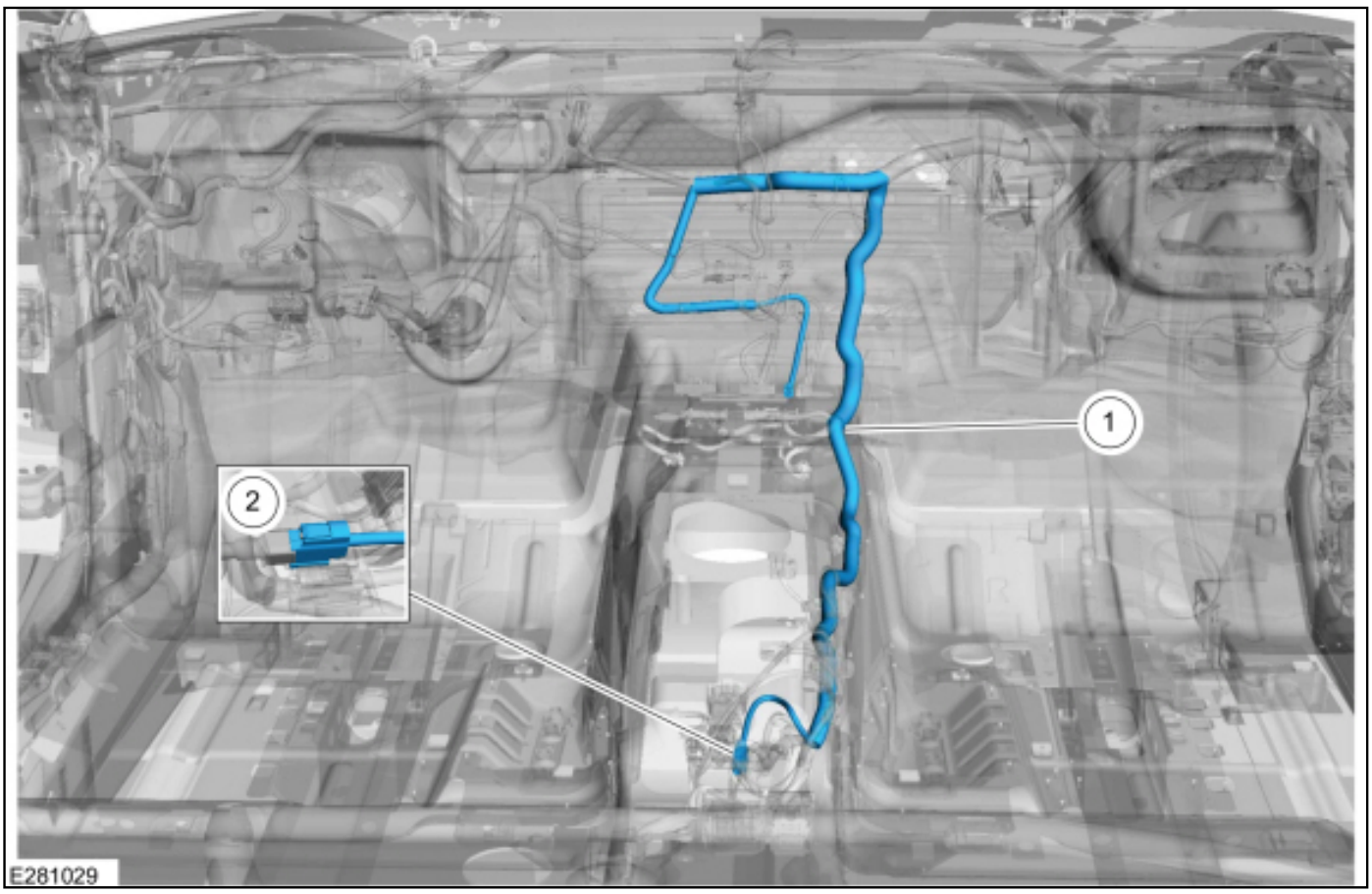
Item	Description
1	Rear audio unit antenna cable
2	Audio unit antenna cable in-line connection (located under the floor console)

Rear Audio Unit (AM/ FM1) Antenna Cable Routing (Convertible)



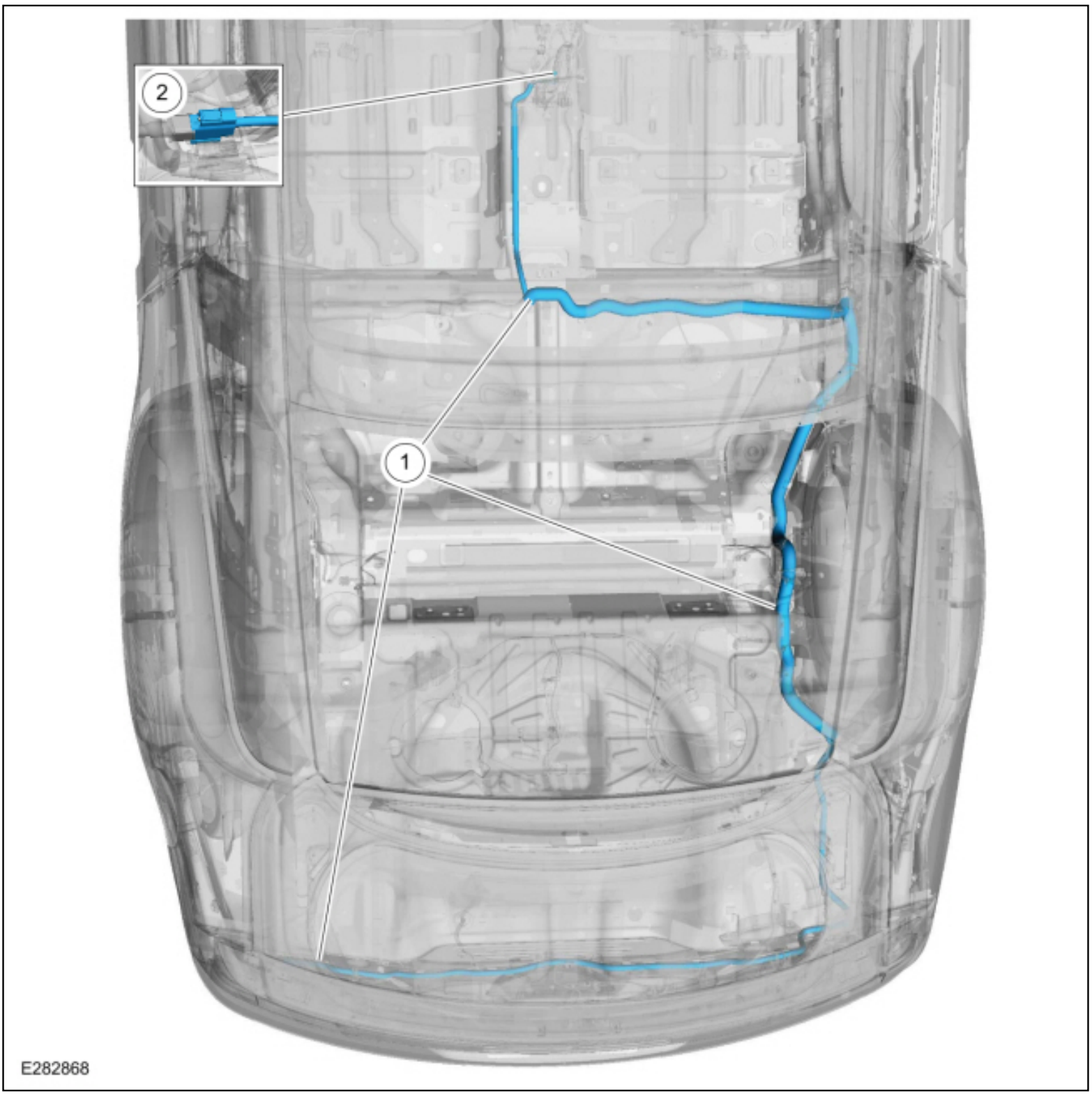
Item	Description
1	Rear audio unit antenna cable
2	Audio unit antenna cable in-line connection (located under the floor console)

Front FM2 Diversity Antenna Cable Routing



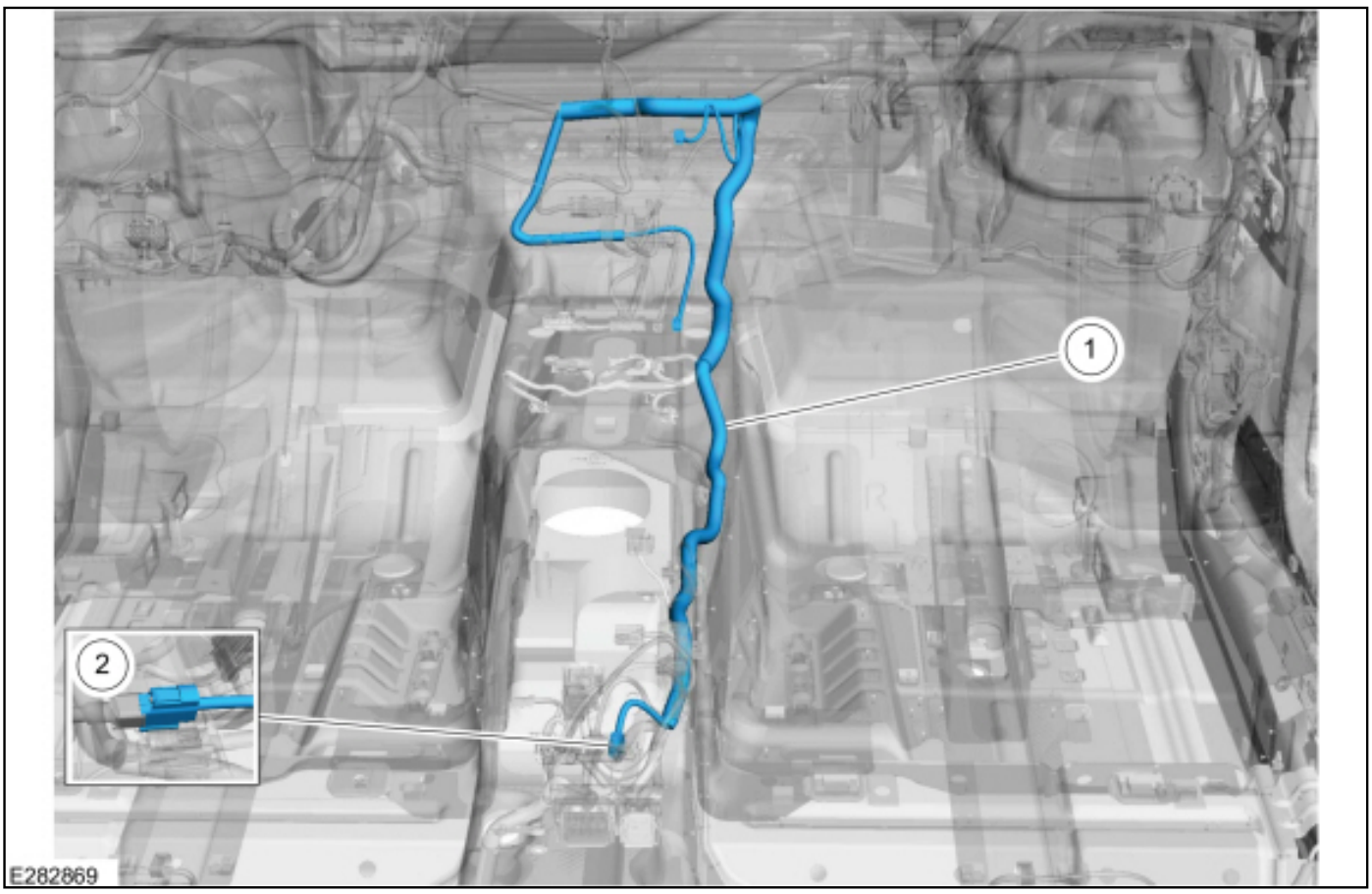
Item	Description
1	Front FM2 diversity antenna cable
2	FM2 diversity antenna cable in-line connection (located under the floor console)

Rear FM2 Diversity Antenna Cable Routing



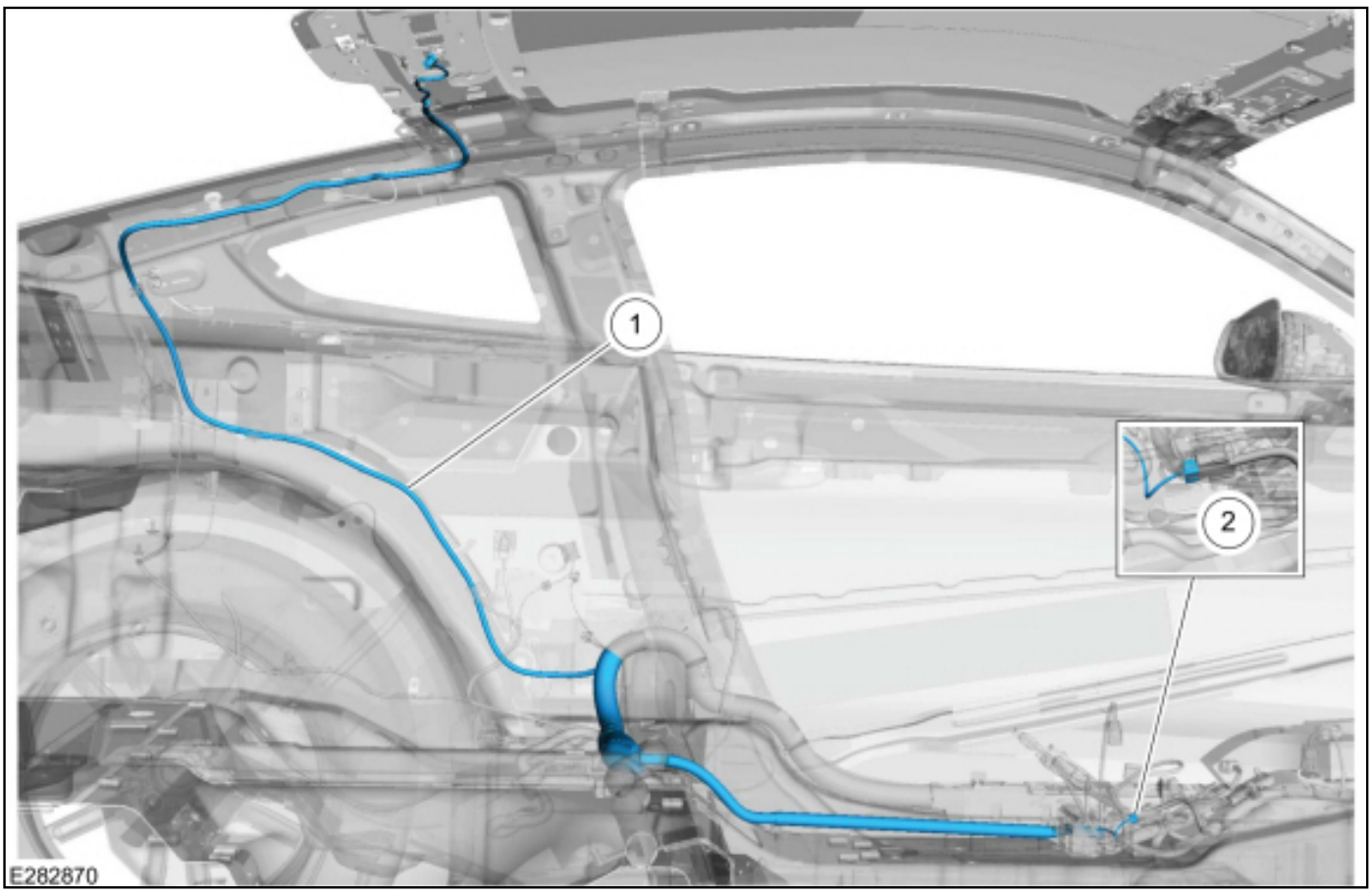
Item	Description
1	Rear FM2 diversity antenna cable
2	FM2 diversity antenna cable in-line connection (located under the floor console)

Front GPS/Satellite Antenna Cable Routing



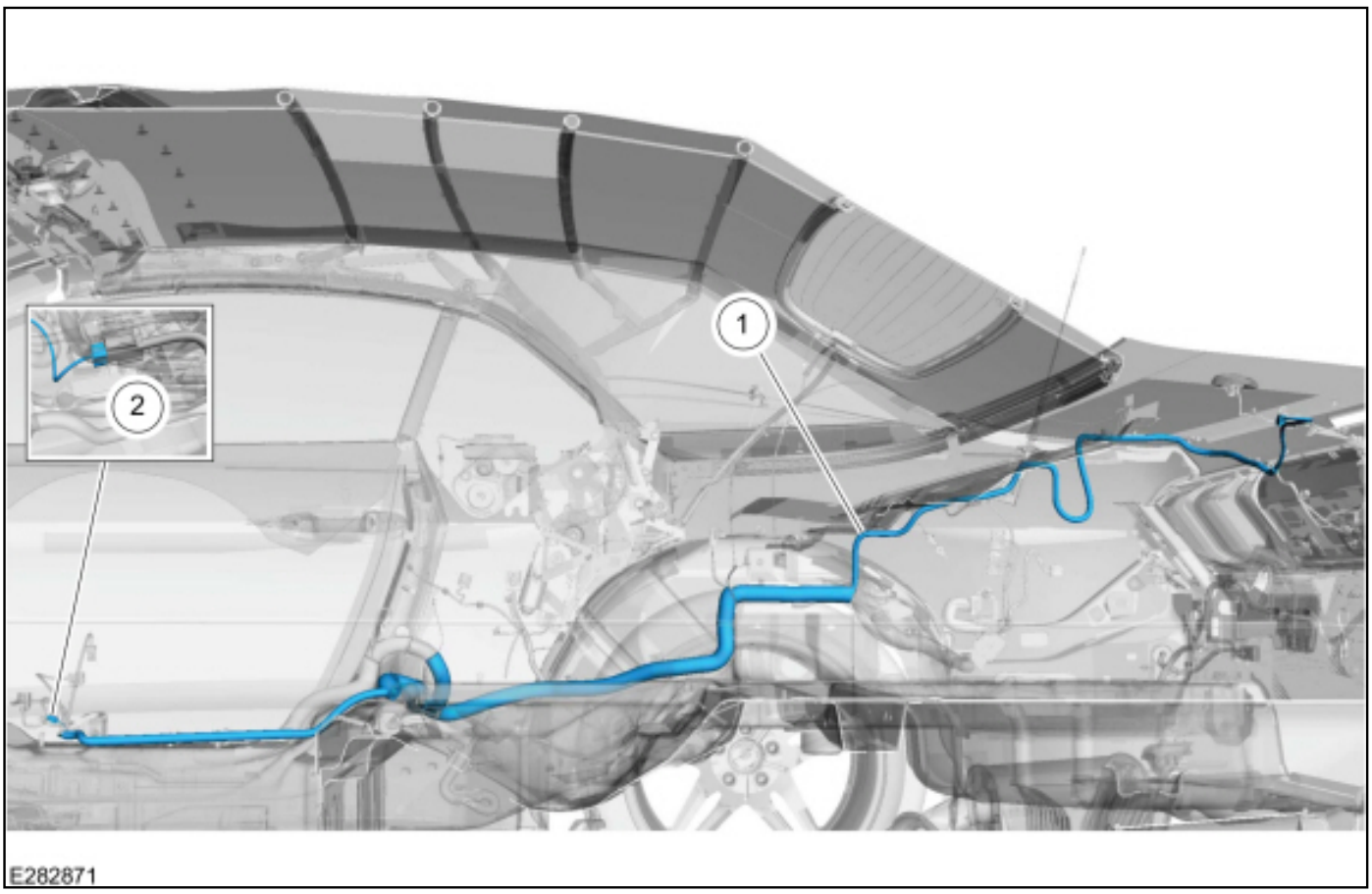
Item	Description
1	Front GPS/satellite antenna cable
2	GPS/satellite antenna cable in-line connection (located under the floor console)

Rear GPS/Satellite Antenna Cable Routing - Coupe



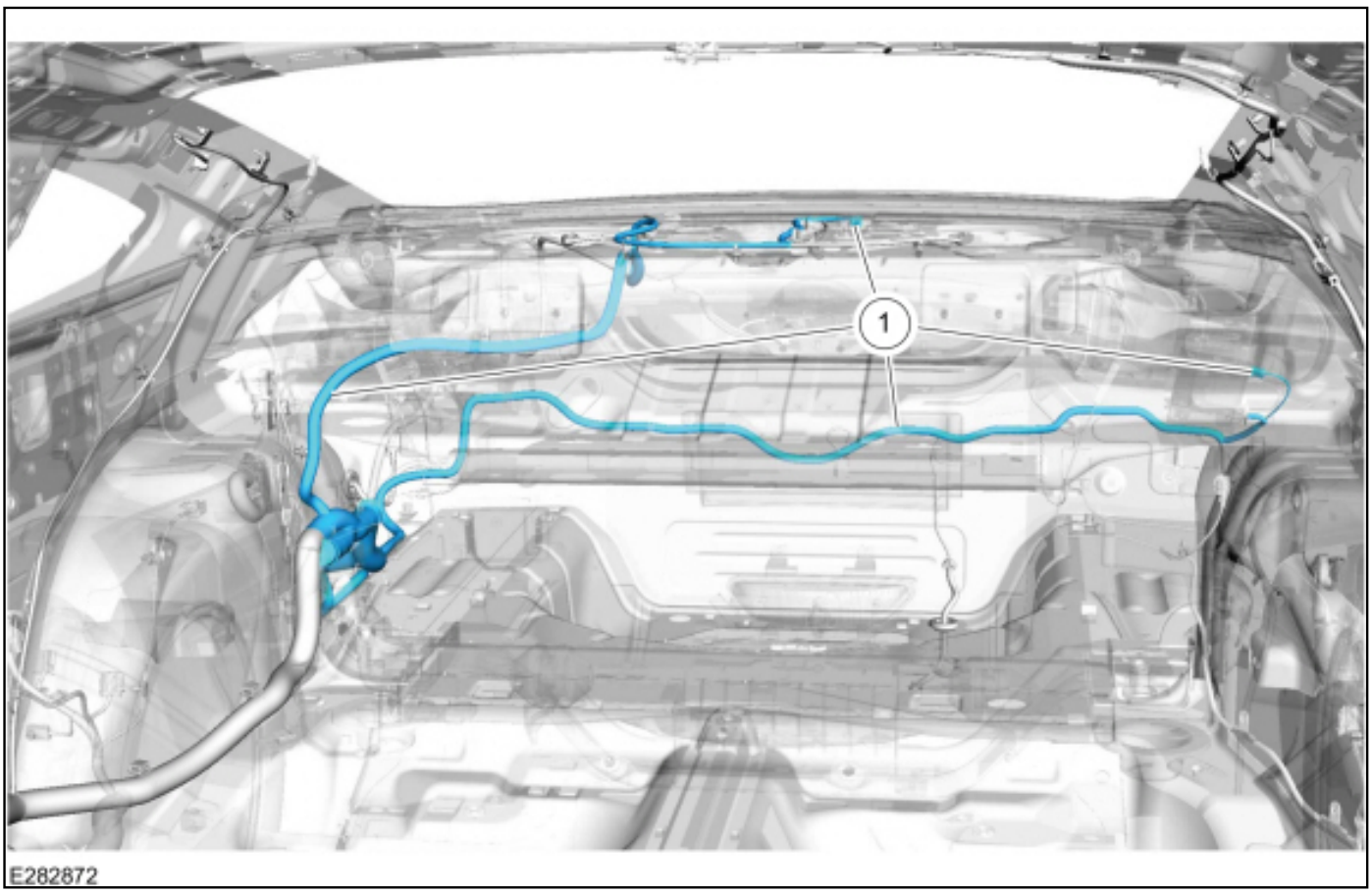
Item	Description
1	Upper GPS/satellite antenna cable
2	GPS/satellite antenna cable in-line connection (located under the floor console)

Rear GPS/Satellite Antenna Cable Routing - Convertible



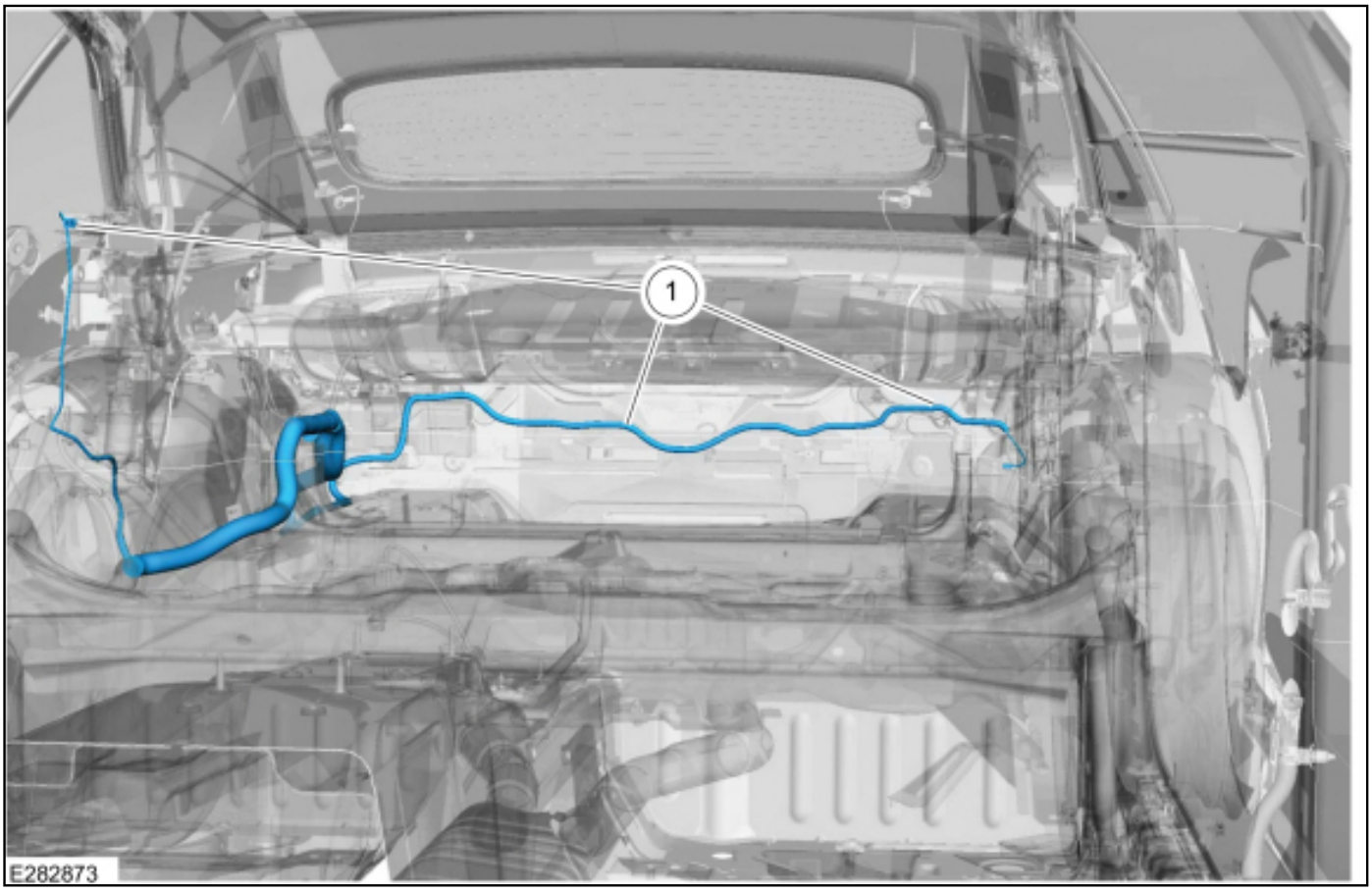
Item	Description
1	Rear GPS/satellite antenna cable
2	GPS/satellite antenna cable in-line connection (located under the floor console)

TCU Antenna Cable Routing - Coupe



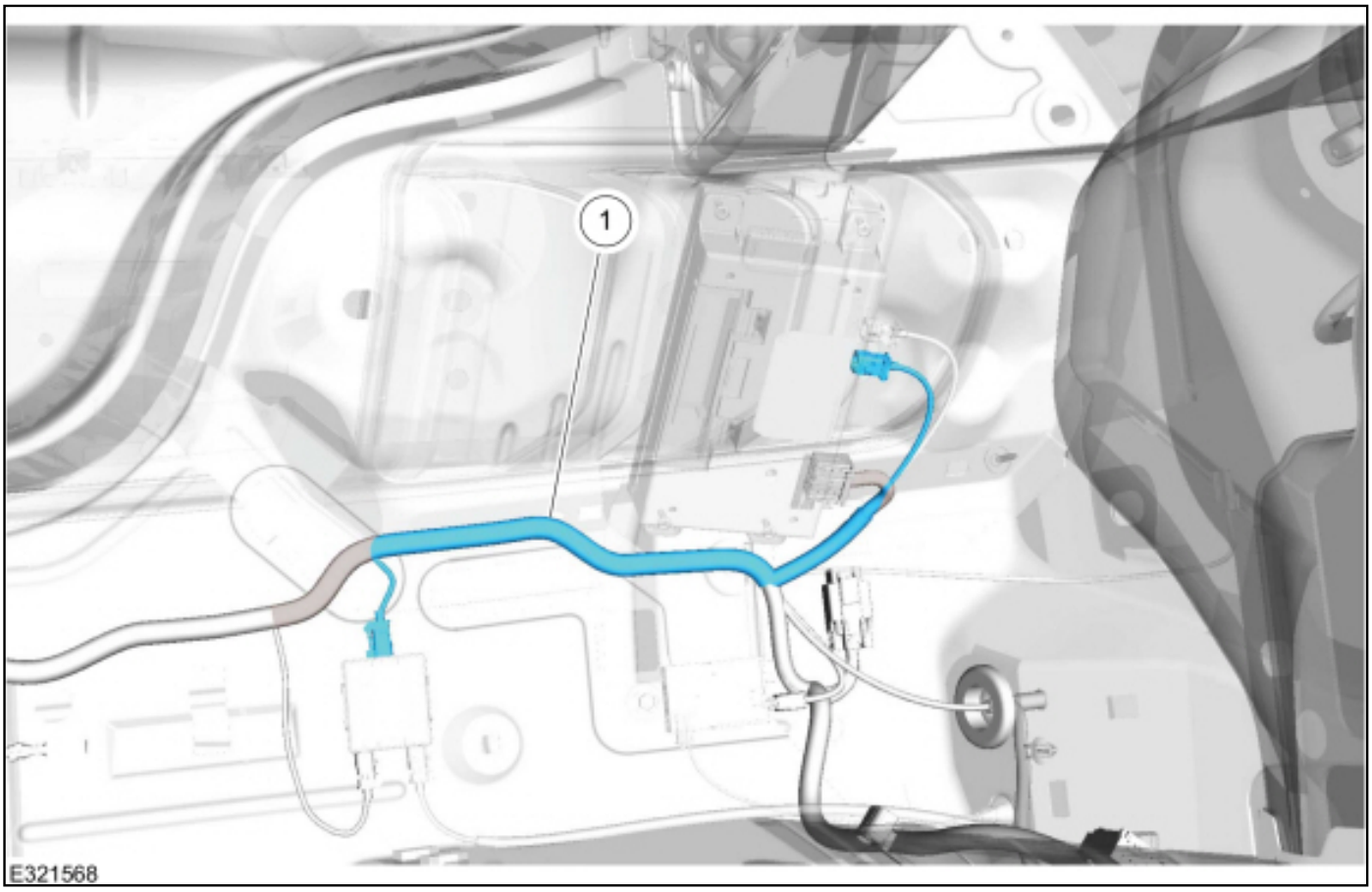
Item	Description
1	TCU antenna cable

TCU Antenna Cable Routing - Convertible



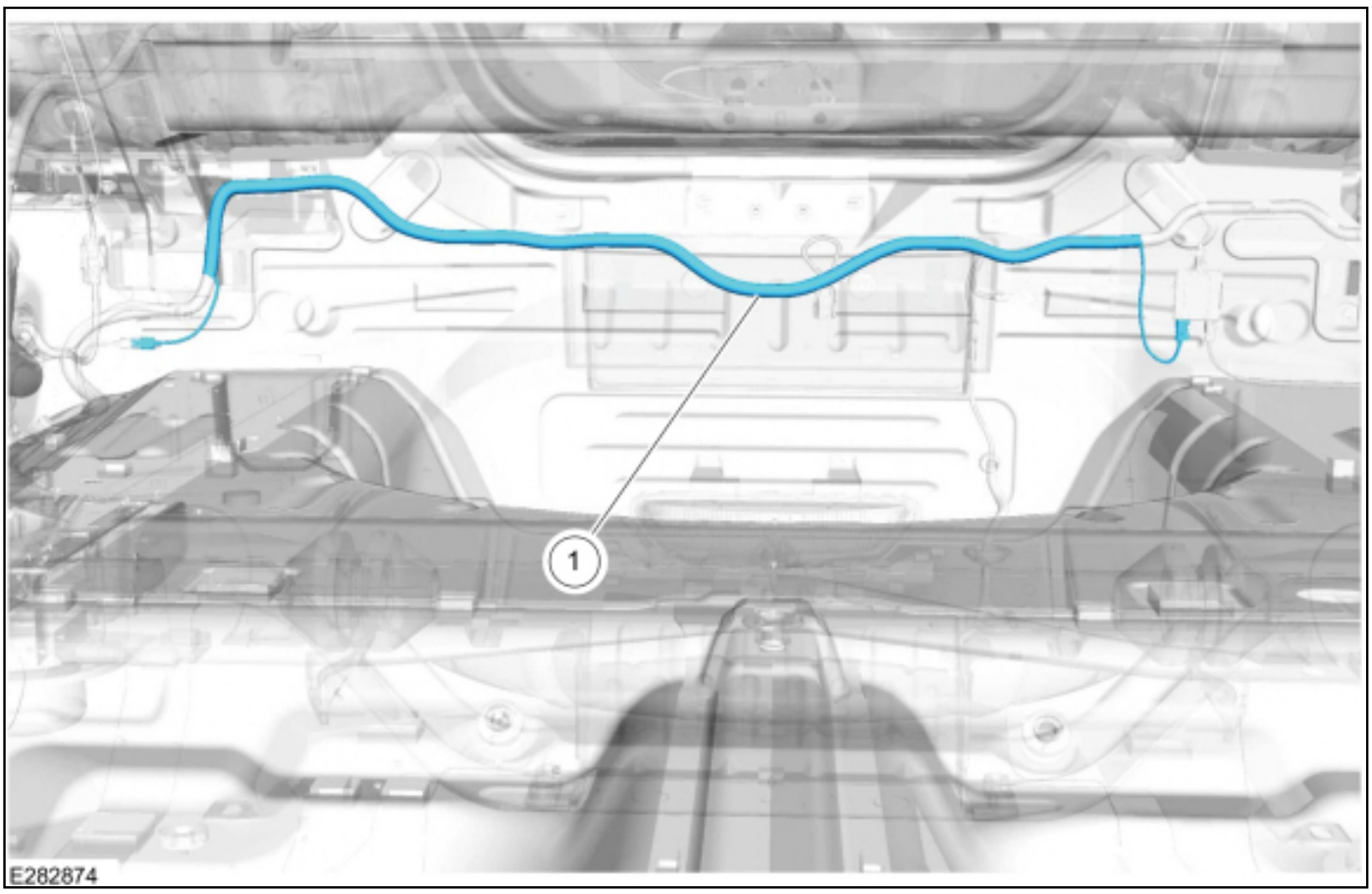
Item	Description
1	TCU antenna cable

Cellular Antenna Cable Routing



Item	Description
1	Cellular antenna cable

Cellular Antenna Extension Cable Routing



Item	Description
1	Cellular antenna extension cable