

## **DESCRIPTION AND OPERATION > INFORMATION AND ENTERTAINMENT SYSTEM - SYSTEM OPERATION AND COMPONENT DESCRIPTION > USB AUDIO MODE**

When a portable media device, such as an iPod® with its available cable or portable mass storage such as a USB thumb drive, is connected to the vehicle audio system through the USB ports, audio from the device can be played through the vehicle speakers. Functions such as volume, seek, fast forward, pause, etc. can be controlled through the vehicle's audio controls.

When playing media files stored on a mass storage device such as a flash drive, the SYNC® system only plays files that do not have DRM protection.

In addition to audio information (track length, track number, etc.), metadata (information such as artist, album title, song title, and genre) may also be sent to the APIM from a device connected to the USB port. The APIM uses the metadata to create indexes that can be used to sort for particular music based on the customer's preferences. Not all USB devices can send metadata to the APIM. When a new media device is connected to the SYNC® system, the APIM automatically indexes the information. This may take several minutes depending on the amount of data on the device, and is considered normal operation. When a device that was previously connected to the SYNC® system is reconnected, the APIM updates the index rather than creating a new one. This reduces the time needed to index the device.

The USB port can be used to upload vehicle Application upgrades to the APIM from a mass storage device such as a flash drive.

## **DESCRIPTION AND OPERATION > INFORMATION AND ENTERTAINMENT SYSTEM - SYSTEM OPERATION AND COMPONENT DESCRIPTION > VOICE RECOGNITION**

Voice recognition allows certain phone and audio system functions to be controlled with voice commands to reduce or eliminate the need to interact with the centerstack infotainment display and/or device while driving.

When the voice steering wheel switch is pressed, an audible prompt originating from the APIM is heard from the speakers. Based on the customer's setting, audible prompts will either be a voice or a simple tone. When interaction mode is set to standard, detailed voice guidance is provided. When interaction mode is set to advanced, most prompts are tones only, and minimal voice guidance is provided. The microphone receives the voice commands and sends them to the APIM. Refer to the Owner's Literature for more information on voice recognition.

## **DESCRIPTION AND OPERATION > INFORMATION AND ENTERTAINMENT SYSTEM - SYSTEM OPERATION AND COMPONENT DESCRIPTION > COMPONENT DESCRIPTION**

### **ACM**

The ACM can be operated with the ignition in RUN, ACC, or OFF.

The ACM receives radio waves containing audio from the antenna coaxial cable(s) and converts them

into fluctuating AC voltage. The ACM receives stereo and mono audio signals from the APIM in the form of fluctuating AC voltage. The ACM processes all inputs, and depending on the input received, sends stereo or mono analog audio signals to the speakers as fluctuating AC voltage.

The ACM receives radio waves containing satellite radio (if equipped) data through the antenna coaxial cable. The data is sent to be displayed on the centerstack infotainment display.

The ACM requires PMI when it is replaced.

## **Antenna**

The AM/ FM radio uses the fixed-mast fender-mounted AM/ FM antenna to receive analog radio waves. The radio waves are sent through the AM/ FM antenna coaxial cable to the ACM, where they are amplified.

If equipped, the satellite radio uses the roof-mounted satellite radio antenna to receive signals containing digital audio and data. These signals are sent through the satellite radio antenna coaxial cable to the satellite radio receiver built into the ACM.

## **APIM**

The APIM can be operated with the ignition in RUN, ACC, or OFF.

The APIM receives stereo and mono inputs. Stereo inputs include audio from the USB port, audio input jack, and connected Bluetooth media device. Mono inputs include audio from the outside device during a phone call and inputs from the SYNC ® microphone.

The APIM sends stereo and mono audio signals to the ACM as fluctuating AC voltage. Stereo outputs include audio from the USB port, audio input jack, and connected Bluetooth media device. Mono outputs include audio from the TTS feature, incoming call ringtone, ringback tone, outside device during a phone call, voice or tone prompts initiated from the steering wheel switches and infotainment centerstack, route guidance voice or tone prompts, and SYNC ® system instructions.

The TTS setting allows the customer to hear incoming caller information and incoming text messages through the audio system speakers so it does not have to be read from the centerstack infotainment display and/or device while driving.

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

The CIP interfaces with all of the customer inputs to the APIM. It contains an analog-to-digital-to-analog converter, as well as the Bluetooth chipset. Any Application upgrades that are available to the customer are loaded directly to the CIP through the USB port.

The VIP provides an interface between the CIP and the vehicle inputs. Its main functions are controlling the APIM power management and translating inbound and outbound CAN signals.

The APIM requires programming when it is replaced.

## **Audio Input Jack**

The audio input jack can be used to play audio files from an audio device connected through the 1/8-inch (3.5 mm) audio jack.

Audio signals are sent from the audio input jack to the APIM.

There are no power or ground circuits to the audio input jack.

## **FCDIM**

The FCDIM can be operated with the ignition in RUN, ACC, or OFF.

The FCDIM displays infotainment data received from various modules over the CAN. If the FCDIM loses the signal from any of these modules, only those specific displays will be inoperative. For more information, Refer to: Information and Entertainment System - System Operation and Component Description . See Module Network Input Messages - FCDIM.

The FCDIM requires PMI when it is replaced.

## **FCIM**

The FCIM audio functions can be operated with the ignition in RUN, ACC, or OFF.

The FCIM audio system buttons provide one of the methods with which the customer interacts with the infotainment system.

The FCIM is separate from the ACM.

The FCIM requires PMI when it is replaced.

## **GPSM**

The GPS antenna integral to the GPSM is used to acquire the compass heading. The compass heading is sent over the CAN to be displayed on the centerstack infotainment display.

The GPSM provides vehicle location information for identifying the vehicle location in the event of a collision.

The GPSM requires PMI when it is replaced.

## **KICKER® Subwoofer Amplifier - If Equipped**

The subwoofer amplifier can be operated with the ignition in RUN, ACC, or OFF.

The subwoofer speaker and subwoofer enclosure are serviced as an assembly. The subwoofer amplifier is serviced separately.

The ACM outputs voltage through the enable circuit to enable the subwoofer amplifier. The ACM also uses this circuit to detect an amplifier overload condition. In the event of an amplifier overload, the subwoofer amplifier modifies the voltage signal from the ACM to increase the voltage on the enable circuit to a higher level than provided by the ACM. This higher voltage level causes the ACM to momentarily reduce the audio levels on the audio output channels to the subwoofer amplifier to prevent clipping and subwoofer speaker damage.

The subwoofer amplifier receives audio signals from the ACM in the form of fluctuating AC voltage. The subwoofer amplifier processes and amplifies these inputs and sends analog audio signals to the subwoofer speaker as fluctuating AC voltage.

## **Noise Suppression Equipment**

The radio frequency suppression equipment reduces interference transmitted through the speakers by the engine, ignition, and electrical systems. When installing any new radio suppression equipment components, make sure that a good contact is made at all connections.

## **Steering Wheel Switches**