



## AAA CENTER FOR DRIVING SAFETY & TECHNOLOGY



### 2017 NISSAN ARMADA SV



Standard and Optional Features in the 2017 Nissan Armada

○ Optional

● Standard

	SV	SL	Platinum
Android Auto			
Apple CarPlay			
Mobile App Support			
Text Messaging			
Navigation	●	●	●
Touch Screen	●	●	●
Gesture Control			
Heads-Up Display			
Voice Commands	●	●	●
Console Control			

### STRENGTHS

- The multifunction dial can be used to quickly navigate through audio and phone touch-screen menus.

### INFOTAINMENT SYSTEM\* DEMAND RATING

Very High Demand



The 2017 Nissan Armada SV NissanConnect® infotainment system imposed a very high demand on drivers in the on-road study. While the phone and audio entertainment facets of the system placed moderate demand on drivers, the cumbersome navigation system was so difficult to use that it negatively impacted the overall performance of the Armada. Drivers were unable to quickly search through the complex navigation menu on the center stack or use the system-specific voice commands to set destinations while remaining focused on the road.

### ABOUT THE STUDY

Researchers evaluated 30 new 2017 vehicles' infotainment systems\* to measure overall demand\*\* placed on a driver when using voice command, touch screen and other interactive technologies to make a call, send a text message, tune the radio or program navigation, all while driving down the road.

### WEAKNESSES

- Searching for navigation destinations is a lengthy process that produces very high levels of demand whether using the center stack or voice commands.
- Calling contacts using voice commands took 27 seconds♦ on average, possibly due to the system forcing drivers to correct mistakes or start over.
- Small audio buttons are spread out across the wide center stack, requiring additional visual demand to activate and pulling attention from the roadway.

\* Infotainment System: Vehicle system that combines entertainment and information content

\*\*Overall demand measured: visual (eyes-off road), cognitive (mental), and time-on-task

♦ Compared to a recommended maximum of 24 seconds

## VEHICLE OVERVIEW: CONTROLS AND DISPLAYS



VOICE COMMANDS



STEERING WHEEL COMMANDS



INSTRUMENT CLUSTER



CENTER STACK

# INFOTAINMENT SYSTEM

The NissanConnect® In-Vehicle Infotainment System offers the following features:

## CALLING AND DIALING



The Nissan Armada's phone system offers access to phone calling using the center stack and voice command system when a phone is paired via Bluetooth. The system conveniently guides the user through the phone pairing process on the touch screen. Once paired, drivers can place calls to contacts and dial phone numbers using the center stack or voice command system. However, the center stack limits access to only a quick dial list of 10 favorite contacts while the vehicle is in motion.

Overall, drivers experienced moderate demand when placing calls using the center stack and voice commands. Drivers took only 13 seconds♦ on average to place calls using the center stack, though with high cognitive (mental) and visual (eyes-off-road) demand. As the touch screen may be out of reach for some drivers, the responsive rotary wheel can be used to navigate through the shallow menu structure efficiently. Unavailable options are grayed out to reduce clutter on the screen and skipped over to reduce the number of steps required to place a call. The phone button on the steering wheel is the only phone menu access point – there is no phone button on or next to the touch screen, which may confuse novice users of the system.

Upon activation, the voice system reads out all of the command options and provides visual prompts on the touch screen. Moreover, drivers in our study took 27 seconds♦ on average to place a call using the voice system, possibly due to the poor accuracy of the system that forces users to correct mistakes or start over.

## AUDIO ENTERTAINMENT



The audio entertainment system includes: AM, FM, and XM radio; CD player and USB port; Bluetooth; and auxiliary audio. Unlike other tested systems, the Armada's system requires drivers to complete an additional pairing process in order to access the phone's audio entertainment. When no phone is paired, drivers can select an audio source using the steering wheel or center stack physical buttons and touch screen.

Drivers were able to use the center stack touch screen or the rotary wheel and physical buttons underneath the touch screen to quickly select audio, resulting in overall moderate demand.

## TURN-BY-TURN NAVIGATION



The Armada comes equipped with the Nissan Hard Drive Navigation System®. Using turn-by-turn navigation, drivers can set destinations to addresses and nearby points of interest using the center stack and voice command system. In-motion restrictions prevent drivers from setting addresses using the center stack controls and from accessing long lists displayed on the touch screen, whether manually, by steering wheel control, or by voice.

Overall, setting destinations using the Armada's navigation system resulted in very high demand. Results indicate using the center stack to search for and set destinations required very high levels of visual demand for long periods of time, likely due to the confusing and complex menu. Multiple navigation-related physical buttons offer similar functions, while the touch screen is cluttered, and buttons are not clearly labeled. Researchers^ commended the lockout function that prevents users from scrolling through long lists within categories while the vehicle is in motion. However, destinations are sorted into sometimes rarely-used categories, such as bowling.

♦ Compared to a recommended maximum of 24 seconds

^ Researchers with expertise about how humans interact with technology evaluated the usability of the infotainment system in stationary vehicles.

Using the voice command system for destination entry was ineffective and created very high demand. Drivers were subjected to very high levels of mental demand for an average of 52 seconds<sup>♦</sup> and were unable to keep their attention focused on the forward roadway. Only some available commands are displayed on the touch screen, and those displayed are not sufficient for accessing the full functionality of the navigation system. Verbal instructions guide users through the first half of the multistep process but fail to inform users of key commands that allow drivers to search for a wide range of destinations. Furthermore, users will not necessarily know the correct categories to search under, potentially leading to errors and frustration.

## VEHICLE CONTROLS AND DISPLAYS

### VOICE COMMANDS



The Armada includes a voice system that allows drivers to access calling and dialing, audio entertainment and turn-by-turn navigation via voice commands. The voice system is activated using the voice recognition button on the steering wheel and plays back a female voice. Options presented on the touch screen can be manually selected without canceling out of the voice interaction.

### INSTRUMENT CLUSTER



The Armada's instrument cluster behind the steering wheel features a small central black-and-white LCD display with familiar gauges on either side. Content can be accessed using steering wheel buttons as well as three buttons located above the cluster display.

### STEERING WHEEL CONTROLS



The steering wheel contains nine buttons and two switches that provide access to the cluster display, audio entertainment, cruise control, the phone menu and the voice recognition system.

### CENTER STACK



The center stack features an 8-inch full-color LCD touch screen, a multifunction rotary wheel, and buttons on the steering wheel. Eleven buttons directly below the touch screen provide access to navigation and vehicle settings. An additional 13 buttons and two dials spread out across the lower half of the center stack control audio functions. Phone functions are available on the touch screen once the phone menu has been loaded using the designated steering wheel button.

Climate control can be accessed using 11 buttons and two dials below the audio entertainment buttons.

## VEHICLE SALES SUMMARY

The 2017 Nissan Armada is the United States' sixth best-selling vehicle in the large-SUV segment and 185th best-selling vehicle overall, with 14,035 vehicles sold during 2016<sup>1</sup>.

<sup>♦</sup> Compared to a recommended maximum of 24 seconds

<sup>1</sup> Source: Automotive News at [autonews.com](http://autonews.com); Wall Street Journal at [wsj.com](http://wsj.com) – data updated to 2/25/2017.