



AAA CENTER FOR DRIVING SAFETY & TECHNOLOGY



2017 JEEP GRAND CHEROKEE LIMITED

INFOTAINMENT SYSTEM* DEMAND RATING

High Demand



The Jeep Grand Cherokee Limited's Uconnect® infotainment system received an overall high demand rating. Using either voice commands or the touch screen, calling and dialing tasks are quick and generate an overall moderate demand on drivers. However, many texting tasks place high overall demand on drivers, and using navigation requires even higher demand.

Standard and Optional Features in the 2017 Jeep Grand Cherokee

	Laredo	Laredo E	Altitude	Limited	Trailhawk®	Summit	Overland	SRT®
○ Optional								
● Standard								
Android Auto								
Apple CarPlay								
Mobile App Support		○	●	●	●	●	●	●
Text Messaging	●	●	●	●	●	●	●	●
Navigation				○	○	●	●	●
Touch Screen	●	●	●	●	●	●	●	●
Gesture Control								
Heads-Up Display								
Voice Commands	●	●	●	●	●	●	●	●
Console Control								

Additional trim level available.

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.

STRENGTHS

- The voice command system accepts a wide range of intuitive commands.
- Calling and dialing is quick and easy using either voice commands or the touch screen.
- The touch screen's phone menu offers an optional 'Do Not Disturb' function that automatically blocks all incoming calls and text messages while driving.

WEAKNESSES

- When sending a text message using voice commands, the system plays a wordy introduction and long list of predefined responses.
- Searching for a point of interest for navigation purposes is time-consuming. On average, it took drivers 58 seconds* to search for a point of interest using voice commands.

* 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 according to the federal government

VEHICLE OVERVIEW: CONTROLS AND DISPLAYS



VOICE COMMANDS



STEERING WHEEL COMMANDS



INSTRUMENT CLUSTER



CENTER STACK

INFOTAINMENT SYSTEM

The Uconnect® Infotainment System offers the following features:

CALLING AND DIALING



The Uconnect® infotainment system in this Jeep Grand Cherokee allows drivers to call contacts and dial phone numbers using voice commands or the center stack. Steering wheel buttons provide quick access to answering and ending calls. If no phone is paired and the driver attempts to access a phone function via voice or touch screen, the system will redirect the user to the phone settings menu on the touch screen to complete the pairing process while the vehicle is stopped or traveling under 5 mph. As an added safety feature, the touch screen's phone menu offers an optional 'Do Not Disturb' function that automatically blocks all incoming calls and text messages.

Placing phone calls using the infotainment system exhibited moderate demand overall, regardless of whether drivers used the touch screen or voice command system.

On-road results suggest the simple design of the touch screen menu helped drivers quickly place calls, albeit with high cognitive (mental) and visual (eyes-off-road) demand. Researchers[^] found the calling and dialing functions easy to access on the touch screen due to its standard phonebook and dial pad setup. The touch screen provides several methods to speed up the calling process, such as the favorite contacts bar along the top and the ability to quickly jump through the contacts list. However, researchers[^] suggest that the dial pad be locked out when the vehicle is in motion as an added safety feature.

In the on-road study, the voice command system led to short task completion times coupled with high cognitive (mental) and moderate visual (eyes-off-road) demand. The voice command system offers an efficient, one-step method to call contacts and dial phone numbers using flexible commands. Though the system does not ask the user to confirm the interpreted command before placing the call, the high accuracy of the system leads to few system errors. Additionally, available commands and examples are displayed on the touch screen for added visual support.

TEXT MESSAGING



With a phone paired, the Grand Cherokee's Uconnect® infotainment system lets drivers send and receive text messages in the phone menu via the touch screen or voice commands. Due to motion restrictions, however, drivers cannot view or send messages via the touch screen while traveling over 5 mph. Instead they can be read aloud by the synthetic system voice. Drivers are still able to send messages using one of 18 predefined phrases via the voice command system.

Accessing text messaging via either the touch screen or voice command system placed an overall high demand on drivers in the on-road study. Drivers were able to use the center stack to quickly navigate to the text messaging inbox and have messages read aloud, but at the cost of high cognitive (mental) and visual (eyes-off-road) demand. The organized text messaging menu structure with clear and standard labeling of buttons contributes to the intuitive process of selecting messages to be read aloud. However, the cramped layout of the menu, which is dense with information, can make it difficult to find the desired selection.

Using the voice command system resulted in high visual (eyes-off-road) demand in the on-road study. The verbose introduction combined with the listing of predefined messages resulted in drivers taking an average of 36 seconds[♦] to complete a task with very high cognitive demand. To send a new text message, users are first presented with the dilemma of choosing which voice command button on the steering wheel to press. One is labeled with the standard voice command

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

[♦]Compared to a recommended maximum of 24 seconds

icon while the other is labeled with the phone pickup icon. After the driver selects the correct button – the phone pickup button – and gives the appropriate command, the system subjects the user to a 30-second message explaining the restrictions for drivers who are not subscribed to Uconnect®. The driver can either listen to the full message or interrupt the system before continuing the process to send a text message. Moreover, all 18 predefined messages are then read aloud one at a time until the user hears the desired one and is then required to interrupt the system to choose it.

AUDIO ENTERTAINMENT



The Grand Cherokee's audio entertainment system provides access to: AM, FM and XM radio; Bluetooth; USB; SD card; and auxiliary audio via touch screen, voice command, and steering wheel buttons.

The audio entertainment system demonstrated an overall moderate demand in the on-road study, and drivers were able to quickly make audio selections using either the touch screen or voice command system.

On-road data suggested changing audio using the touch screen imposed high levels of cognitive demand and very high levels of visual demand. The structure of two different menus through which audio selections are accessible is visually consistent with the rest of the system, making it easier for drivers to switch between functions. The buttons are small and clustered close together within the large touch screen, leaving a sizeable area of empty, but valuable, screen space. This may make it difficult for users to select the desired button easily, especially since, as researchers commented, the touch screen may be out of comfortable reach for the average driver.

Drivers were able to select a new audio source with voice commands while keeping their eyes on the road. Researchers noted the voice system processes a wide range of audio-related commands with high accuracy. However, the high levels of cognitive demand recorded were likely due in part to the slightly more complex commands needed to select music from a USB source.

NAVIGATION SYSTEM



The Grand Cherokee's infotainment system includes a turn-by-turn navigation system that drivers can access via the touch screen or voice commands. When the vehicle is in motion, the system restricts drivers from entering an address via the touch screen but does allow the user to select a point of interest. Additionally, drivers can view guidance on the instrument cluster.

The Jeep Grand Cherokee's navigation system performed better than the majority of other vehicles tested, yet still revealed an overall very high demand.

Searching for points of interest using the touch screen was very highly time-consuming, 34 seconds* on average, and produced high levels of cognitive and visual demand. Setting navigation guidance using the touch screen was difficult and confusing, due in part to the complex and extensive menu structure laden with overly specific categories.

Searching for a point of interest via voice commands led to a moderate level of visual (eyes-off-road) demand with high levels of cognitive (mental) demand. Moreover, it took drivers in the on-road study 58 seconds on average, far surpassing the acceptable 24-second standard. Researchers attributed the longer interaction times to the limited search functionality of the system: It cannot search for destinations by name but must search for them within a broader category without any prompt about which categories are available.

*Compared to a recommended maximum of 24 seconds

VEHICLE CONTROLS AND DISPLAYS

VOICE COMMANDS



Depending on the desired function, drivers can press one of two voice activation buttons on the steering wheel. In a highly unusual design choice, one activation button is used exclusively for phone functions, while the other can be used for certain phone functions in addition to all audio entertainment and navigation functions. Once activated, the voice system plays back a synthetic female voice and offers available relevant commands on the touch screen in small text.

INSTRUMENT CLUSTER



The Jeep Grand Cherokee's instrument cluster, located behind the steering wheel, features a 7-inch digital display housing the digital speedometer and is surrounded by analog gauges on either side. It offers a range of menus detailing system status and infotainment components. Users can customize the menus to optimize their experience.

STEERING WHEEL CONTROLS



The steering wheel has 19 buttons, with 13 on the front and six on the back. Buttons on the left side give access to the center stack screen, voice commands and phone functions, while those on the right side offer access to cruise control. The buttons on the back side of the steering wheel are used for audio entertainment selection and volume control.

CENTER STACK



The center stack features an 8.4-inch touch screen with a customizable, static menu ribbon across the bottom, giving access to audio entertainment, navigation, phone integration, vehicle settings and climate control. Four buttons and dials below the touch screen provide additional menu navigation options, while an additional 11 buttons and dials give access to climate control.

VEHICLE SALES SUMMARY

The Jeep Grand Cherokee is the 19th best-selling vehicle in the United States, with 212,273 vehicles sold in 2016¹.

¹Source: Automotive News at autonews.com; Wall Street Journal at wsj.com – data updated to 2/25/2017.