



# AAA CENTER FOR DRIVING SAFETY & TECHNOLOGY



## 2017 LAND ROVER RANGE ROVER SPORT HSE



### INFOTAINMENT SYSTEM\* DEMAND RATING

Very High Demand



The 2017 Land Rover Range Rover Sport HSE InControl® infotainment system\* placed very high overall demand on drivers in the study. Voice commands for audio entertainment and phone calling were kept short although at the cost of higher cognitive (mental) demand. Of note, using the touch screen to access the navigation system and audio entertainment imposed very high overall demand.

### Standard and Optional Features in the 2017 Land Rover Range Rover Sport

- Optional
- Standard

	SE	HSE	HSE Dynamic	Autobiography	SVR
Android Auto					
Apple CarPlay					
Mobile App Support	●	●	●	●	●
Text Messaging					
Navigation	●	●	●	●	●
Touch Screen	●	●	●	●	●
Gesture Control					
Heads-Up Display	○	○	○	○	○
Voice Commands	●	●	●	●	●
Console Control					

Additional trim levels available.

### ABOUT THE STUDY

Researchers evaluated 40 new 2017/2018 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, program audio entertainment or program navigation, all while driving down the road.

### WEAKNESSES

- No navigation functions are locked out while the vehicle is in motion, and interactions took nearly one minute<sup>‡</sup> on average.
- Search functions and QWERTY keyboards are accessible while the vehicle is in motion, contributing to the very high overall demand of the center stack.
- The touch screen imposed very high overall demand on drivers, who took an average of 27 seconds<sup>‡</sup> to complete audio entertainment tasks.
- No phone functions are locked out while the vehicle is in motion (after pairing a phone).

### STRENGTHS

- The menu structure is color coded to quickly notify the user which functions are active.
- Large buttons make touch-screen selections easy for users.

\* 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 Range Rover Sport's InControl® In-Vehicle Infotainment System\* offers the following features:

## CALLING AND DIALING



The Range Rover Sport's InControl® infotainment system\* provides full calling and dialing functions via voice commands and the touch screen after pairing a phone. Limited functionality is available using steering wheel buttons. Drivers can pair a phone over Bluetooth via the touch screen while the vehicle is in park, but not while the car is in motion. No phone functions are locked out while the vehicle is in motion.

Using the voice command system and the touch screen to make a phone call required high demand overall. Center stack interaction lengths were, on average, 21 seconds<sup>‡</sup>. An excess amount of visual information loaded on the screen, full access to a dial pad and a predictive QWERTY search function in the phone book imposed very high visual (eyes-off-road) and cognitive (mental) demand on drivers.

Voice command interactions averaged around 24 seconds<sup>‡</sup> each and evoked high cognitive demand. Researchers<sup>‡</sup> noted that the system excels at accurately interpreting users' voice commands and has a quick processing time. Certain functions, however, such as a driver correcting a misinterpreted phone number, required having to start the task from the beginning, lengthening the total task time when using voice commands to place a call.

Researchers<sup>‡</sup> remarked that the Range Rover's calling and dialing strengths include a touch-screen menu structure with large, easy-to-interpret buttons, and a fixed, color-coded sidebar menu located on the driver's (left) side of the screen. This allows drivers to quickly determine which menu is currently active and which ones are available (e.g., the blue tint represents phone functions). Although these contributions improved the overall user experience with the system, they did not reduce overall demand.

## AUDIO ENTERTAINMENT



The Range Rover's audio entertainment system provides full access to: AM, FM and XM radio; devices connected via Bluetooth, USB and HDMI; and SD cards. Drivers can access all sources using the touch screen and voice command system with some limited functions accessible via buttons on the steering wheel.

Overall, the system placed high demand on drivers when completing audio entertainment tasks. Voice command and center stack interactions varied widely in their demand. Voice commands to change the radio and select music generated moderate overall demand, with an average engagement time of 19 seconds<sup>‡</sup>. Researchers<sup>‡</sup> noted that the system's inconsistent interpretation of a driver's vocal audio entertainment commands may have contributed to very high cognitive demand levels. The absence of a tone or beep (indicating the system was processing commands) may have imposed more visual demand on the driver, forcing them to look at the touch screen for the color change in the voice command icon.

The touch screen imposed very high overall demand on drivers, who took an average of 27 seconds<sup>‡</sup> to complete an audio entertainment task. The audio entertainment system is easily accessible from the home screen and provides standard labels for most functions. However, nonintuitive functions located throughout the interface and the overwhelming number of pathways to complete the same task may have driven cognitive demand up and prevented drivers from keeping their visual attention on the road.

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

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

<sup>‡</sup> Researchers with expertise about how humans interact with technology evaluated the usability of the infotainment system in stationary vehicles.

## TURN-BY-TURN NAVIGATION SYSTEM



The Range Rover Sport HSE includes the InControl® Touch Pro turn-by-turn navigation system (Version 20.14-1165), accessible via the touch screen. No functions are locked out while the vehicle is in motion, giving the user full access to the category directory and a QWERTY keyboard to search for points of interest and addresses. Drivers can view guidance on the touch screen and instrument cluster display.

Completing navigation tasks placed very high demand on drivers, pulling visual and cognitive attention away from the roadway for excessive lengths of time (58 seconds<sup>9</sup> on average). The manufacturer's efforts to reduce visual demand, such as contrasting important information with less relevant information using brightness and color, and easing cognitive demand by providing comprehensive and intuitive categories, did not negate the demands of the interface. Allowing drivers access to a keyboard to type in a search term while driving also draws visual attention away from the driving task.

## VEHICLE CONTROLS AND DISPLAYS

### VOICE COMMANDS



The 2017 Land Rover Range Rover Sport HSE comes equipped with a voice command system that allows drivers to access audio entertainment and phone functions. Pressing the designated voice command button on the steering wheel activates the system and plays back a natural, male voice with which drivers can interact. While the voice system is active, users can make selections by either using voice commands or selecting options directly on the touch screen. Upon activation, no command prompts are listed on the center stack touch screen; however, if a valid command is not given by the user, the system will provide prompts on-screen.

### INSTRUMENT CLUSTER



The instrument cluster located behind the steering wheel features a standard analog speedometer and tachometer surrounding a full-color display. Vehicle status information, display settings and driver assistance status menus can be accessed on the display using five buttons on the steering wheel whose functions are menu-dependent. Small text overlays detailed graphics, which increases visual clutter and may occlude or distract from driving-relevant information.

### STEERING WHEEL CONTROLS



The steering wheel contains 12 buttons, three of which have context-dependent functionality, creating a potentially confusing user experience. Eight buttons on the left side of the steering wheel give access to content on the cluster display, audio entertainment, phone call pickup and hang-up, and the voice command system activation. Five buttons on the right side are dedicated to cruise control.

<sup>9</sup>Compared to a recommended maximum of 24 seconds.

## CENTER STACK



The center stack is equipped with a small dial to control volume and a 10.2-inch full color touch screen that, by default, gives access to four main infotainment functions: audio entertainment, phone calling, navigation and climate. Each submenu is presented as a color-coded tile on the home screen. The home screen can be customized to display up to four pages of different widgets. The ever-present menu ribbon, located along the bottom of the screen, gives access to the four main menus as well as tiles to navigate to the home screen, previous screen, settings menu, seat HVAC, backup camera, parking assist and 4x4 information. Once within a menu, the screen splits into the main menu on the left with a side menu for quick shortcuts to the other three available main menu tiles.

Images on the main menu tiles are highly detailed photographs that do not distinctly reference the function they represent. Icons within the menu ribbon do not match the icons used to represent the main menu tiles, nor do they intuitively indicate the function of said menu. The excess number of graphics does not noticeably affect loading time, although excessive animations lead to lengthy transitions between menus.

Climate control can be accessed using either the touch-screen climate menu or via the three dials and eight buttons located below the touch screen.

## VEHICLE SALES SUMMARY

The 2017 Land Rover Range Rover Sport is the 157th bestselling vehicle in the United States, with 19,153 sold during 2017.<sup>s</sup>

<sup>s</sup>Source: *GoodCarBadCar* at [goodcarbadcar.net](http://goodcarbadcar.net) — data updated to Dec. 31, 2017.