

3. Construction

General

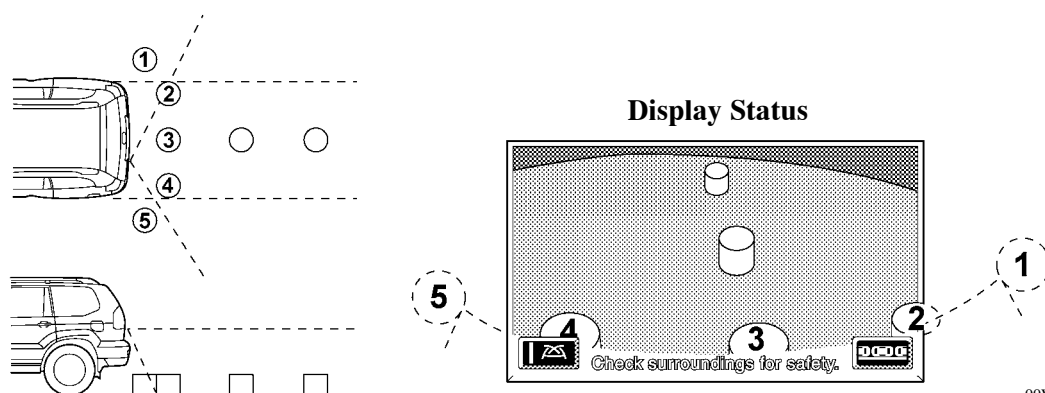
The television camera ECU controls the system by using information from the each components. The functions of components are as follows:

► Functions of Components ◀

Item	Function
Television Camera	<ul style="list-style-type: none"> Mounted on the back door to transmit the rearview of the vehicle to the television camera ECU. A color video camera that uses a CCD (Charge Coupled Device) and a wide-angle lens.
Television Camera ECU	<ul style="list-style-type: none"> Transmits video signals, which are composed of rear view of the vehicle taken with the television camera and parking assist guide lines, to the multi display. Furthermore, it effects overall control of the system based on signals received from the sensors and the navigation ECU. The television camera ECU sets a warning message or guide message of the parking assist monitor using the same language selected for the multi display.
Multi Display	Receives digital RGB signals composed of rear view of the vehicle with parking assist guide lines transmitted from the television camera ECU, and displays them on the display panel.
Navigation ECU	<ul style="list-style-type: none"> Transmits the movement of the vehicle to the television camera ECU. Transmits the current language settings to the television camera ECU. These settings were selected using the language select function of the multi display.
Steering Angle Sensor	Detects the angle of the steering wheel and sends the resulting signals to the television camera ECU.
Combination Meter	Transmits the vehicle speed signal to the television camera ECU.
Shift Position Sensor or Back-up Light Switch	Transmits the “R” position signal to the television camera ECU.
Back Door Courtesy Switch	Transmits a back door open signal to the television camera ECU.

Area Displayed on Display Panel

- On the multi display, objects on the right of the vehicle appear on the right side of the display panel, and objects on the left of the vehicle appear on the left side of the display panel.
- The television camera uses a wide-angle lens. The perceived distance from images that appear on the display panel differs from the actual distance.



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NOTE:

Area displayed on display panel may vary according to vehicle status or road conditions.

The area covered by the television camera is limited. The television camera does not show objects close to either corner of the bumper or under bumper.

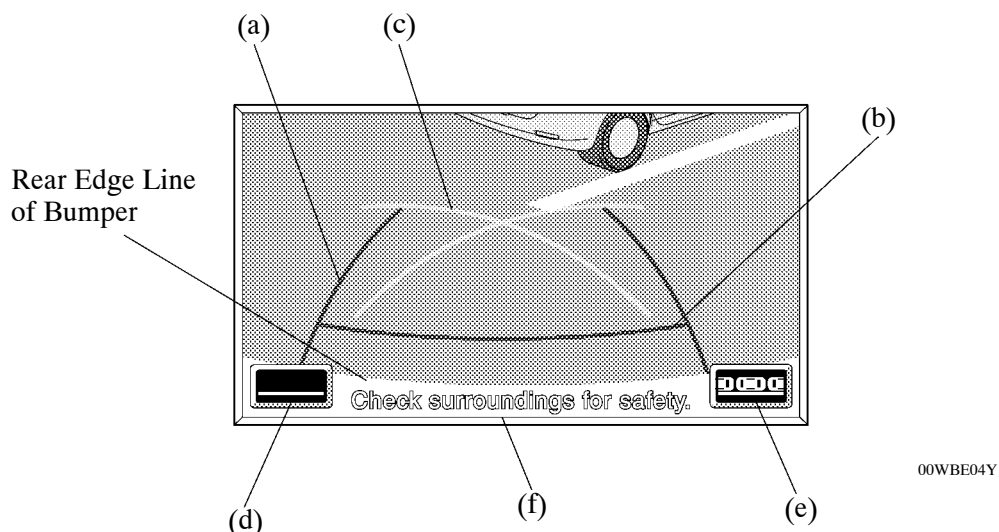
Description of Display

1) General

- This system displays the following two modes: the manual assist mode used for parking the vehicle in a garage or parking area, and the parallel parking assist mode, which assists the driver by providing the appropriate steering angle and timing during serial parking.
- The driver can switch the system modes by pressing the touch switch, although the display is initially set to the parallel parking assist mode at the factory. The television camera ECU stores the mode at the time the ignition switch is turned OFF in its memory. Therefore, the mode that is stored in the television camera ECU appears when the ignition switch is subsequently turned ON.

2) Manual Assist Mode

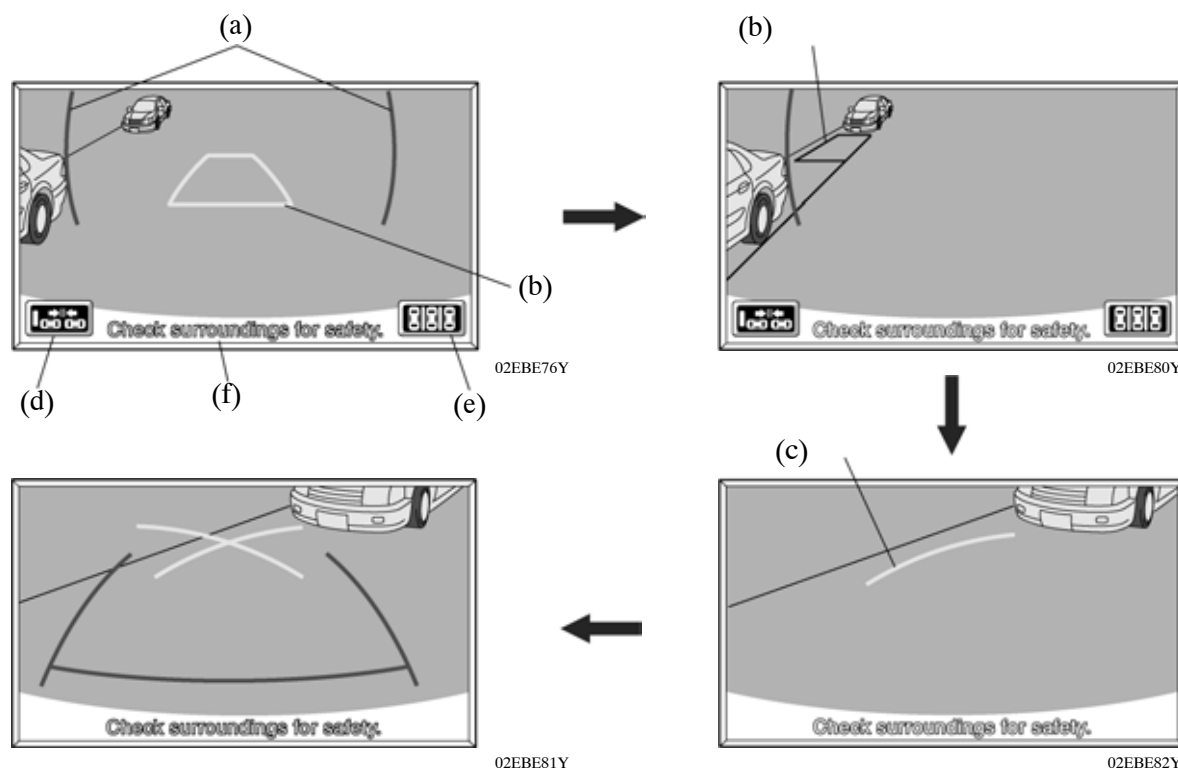
- When the system operates in the manual assist mode, fixed guide lines appear with the rearview of the vehicle as illustrated below. These guide lines can be used to assist the driver while the vehicle is moving backward.
- In this mode, the driver can press the changeover switch on the display to change the guide line pattern.



Item			Description of Display
(a)	Vehicle Width Extension Line		A guide line for assisting the driver's assessment of the width of the vehicle.
(b)	Distance Guide Line (Red)		A guide line that serves as a reference for the driver to assess the distance from the rear of the vehicle. {Approximately 50 cm (1.6 ft.) from rear end of bumper}
(c)	Parking Guide Line		A guide line indicating the prospective outer path of the vehicle when the steering is turned fully to the right or left end.
(d)	Changeover Switch		Three guide line patterns are available, and can be switched by pressing this switch.
(e)	Touch Switch	Manual Assist Mode	The system switches from the manual assist mode to the parallel parking assist mode by pressing this switch.
		Parallel Parking Assist Mode	
(f)	Warning Message Display Area		Displays a warning message.

3) Parallel Parking Assist Mode

In this mode used for parallel parking, the television camera ECU switches the display of the guide lines in accordance with the parking maneuvers of the vehicle. This provides the driver with an appropriate steering angle and timing during parallel parking.



(The same guide lines are shown as in the manual assist mode.)

Item			Description of Display
(a)	Green Vertical Line		A guide line that serves as a reference position for starting parallel parking.
(b)	Green Outline		A guide line that serves as a reference position for completing the intended parking. This guide line disappears once the vehicle starts moving backward.
(c)	Parking Guide Line		A guide line indicating part of the prospective outer path of the vehicle when the steering is turned fully to the right or left end. This guide line appears only after the guide lines (a) and (b) disappear.
(d)	Mode Select Switch		Switches between standard and narrow modes.
(e)	Touch Switch	Manual Assist Mode	The system switches from the parallel parking assist mode to the manual assist mode when this switch is pressed.
		Parallel Parking Assist Mode	
(f)	Warning Message Display Area		Displays a warning message.

4) Warning Message

A warning message appears at the bottom or the center of the screen under the conditions listed below, regardless of whether the system is in the manual or parallel parking assist mode.

► Messages appearing at the bottom of the screen ◀

Warning Message	Outline
Check Surroundings for Safety	This message always appears during system operation.
System Initializing	This message appears when the system is restarted if the television camera ECU detects that a battery terminal has been disconnected and subsequently reconnected.
Guidance Unavailable	This message is displayed when the vehicle is moved backward further, even though a message, “Steering wheel turned too far, please return”, is displayed in the center of the display and also the system judges it is impossible to perform the assist operation.

► Messages appearing at the center of the screen ◀

Warning Message	Outline
System not Ready	This message appears if the system is started without initializing after a part is replaced.
Steering Wheel Turned too Far, Please Return	<p>This message is displayed when the system cannot perform the assist operation under the following situations:</p> <ul style="list-style-type: none"> ● When the vehicle starts in the parallel parking assist mode, a side-to-side clearance between your vehicle and the other parked vehicles is not approximately 1 m (3.3 ft.) (too far or too close). ● The steering wheel is turned too far.