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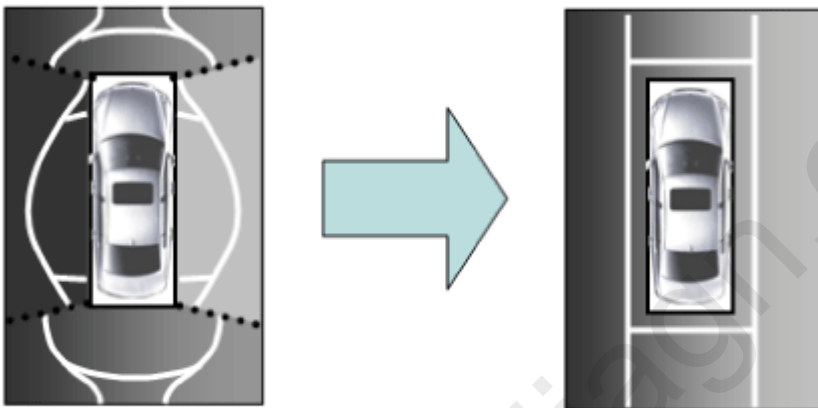
DESCRIPTION

Surround View Monitor (AVM) allows video monitoring of 360 degrees around the vehicle. The system consists of 4 ultra optical cameras mounted around the vehicle (front, both sides and rear).

The video images from these cameras are applied with distortion compensation, time point conversion, and video merging technologies to provide sky-view image of the vehicle's surrounding area, as well as various other view modes.

The AVM System provides video feed of the vehicle's surrounding area while parking or during low speed driving to the driver to enhance safety and driver's convenience.

Also, it features steering wheel synchronized guide line indication, front and rear object warning, and A/S (including In-Line) tolerance compensation.



This system displays the video images from ultra optical cameras mounted on 4 sides of the vehicle, on the Head Unit Screen. It shows 360 degrees sky-view image of the vehicle's surrounding area, as well as various other view modes.

MAJOR FEATURES

1. Display Surrounding Area of Vehicle in Video

The surrounding area video display function displays 360 degrees video image captured from four cameras on the Head Unit Screen while the vehicle is moving at low speed or reversing. The AVM System displays total 8 video modes for displaying surrounding video based on the vehicle driving state and the driver's selection.

2. Guide Line Indication & Steering Wheel Synchronized Feature

The Guide Line Indication & Steering Wheel Synchronized Feature is the function that assists the driver in parking by synchronizing the steering wheel with the rear view video display marked with a guide line to help anticipate the direction of the reversing vehicle.

3. Front/Rear Object Warning (Obstacle Detection Feature)

The system receives obstacle warning signal from the PDW or PA sensors mounted on the front/rear of the vehicle and displays the obstacle location on the AVN Head Unit Screen.

4. Tolerance Compensation (including A/S)

Manual Tolerance Compensation Software is embedded in the AVM ECM to compensate the AVM deviation that may occur due to assembly line installation tolerance. You must first setup proper work environment in order to perform correct tolerance compensation.

Main Features

English

No.	Main Features	Detailed Description	Notes
1	8 Display View Modes	<ul style="list-style-type: none">• 4 Front & 4 Rear Display View Modes	Merged Video Display of 8 Modes
2	Front Assist Mode Selection Feature	<ul style="list-style-type: none">• Display only the Front Mode by using the Front Mode Selection Switch	Same as the PDW AVM Switch
3	Rear Steering Synchronized Parking Guide Line Display	<ul style="list-style-type: none">• Displays Parking Guide Line by synchronizing with the steering wheel when going reverse.	Display over the Rear Video
4	PDW Obstacle Indication	<ul style="list-style-type: none">• Display obstacle warning from rear and front PDW	Display both on the Cluster and the Head Unit
5	User Setting Option	<ul style="list-style-type: none">• Select Steering Wheel Synchronized Guide Line Indication• Select Front/Rear Obstacle Indication• Select Initial Front/Rear View Screen	Provides additional screen settings
6	Assembly Line & A/S Tolerance Compensation Feature	<ul style="list-style-type: none">• Compensation - Tolerance Compensation for camera installation deviation and assembly line tolerance is required	Compensation function recognition logic applied

AVM Mode Entry Conditions

The vehicle information is accessed regularly, even after entering AVM mode. When the conditions are met, conversion from front mode to rear mode is available, and vice versa.

When the mode is converted, the view displayed on the screen can be the initial view or the previous view depending on the conditions. If the mode for conversion is the initial entry, the default view is selected based on the front or rear. If a continuous front-rear conversion mode occurs as forward and backward movement are repeated for parking, the previous view is recalled and displayed.

- Initial Entry : When the rear and front view modes in AVM mode are displayed on the screen for the first time.
- Re-entry: When switching from AVM mode to another mode, without turning off AVM, and returning to the previous mode
(e.g. Rear → Front → Rear: Re-enter rear mode / Front → Rear → Front: Re-enter front mode)

Switch mode	Vehicle speed	Gear	AVM Switch	Display view
Rear → Front	Below 20 km/h	R Range or P Range excluded	ON	Initial Entry: Front view set in the initial view mode option
				Re-entry: The last view mode displayed in the previous front mode
Front → Rear	Irrelevant	Reverse Gear	Irrelevant	Initial Entry: Rear view set in the initial view mode option
				Re-entry: The last view mode displayed in the previous rear mode

AVM Mode Disengagement

If the conditions below are satisfied while in AVM mode, the AVM is turned OFF and no video is displayed.

OFF Mode	Vehicle speed	Gear	AVM Switch	Notes
Front mode	Over 20 km/h	R Range or P Range	OFF	If any of the three conditions is satisfied
Rear mode	Irrelevant	Except R gear	Irrelevant	If any of the two conditions is satisfied

AVM Options

Considering the user's convenience, the AVM provides three options for the user to select from.

The window for changing options (parking guide settings) is displayed on the AVN. Only the changed options are forwarded to the AVM unit through M_CAN.

These three options are applied as soon as they are selected by the user. Based on the conditions, the initial views displayed are as follows.





Option	Function	Default setting
Guideline steering interlocking	Interlocks with steering to display the driving direction of the vehicle during parking.	Classification code
Close range warning indicator	Indicates front and rear obstacle detection	Classification code
Initial view mode setting	Default view displayed when entering AVM mode	Front + Around view
		Rear + Around view

Operations for Guideline Steering Interlocking Indications

The guideline for steering interlocking trace is indicated by using the value of steering wheel angle periodically received by AVM unit via C-CAN.

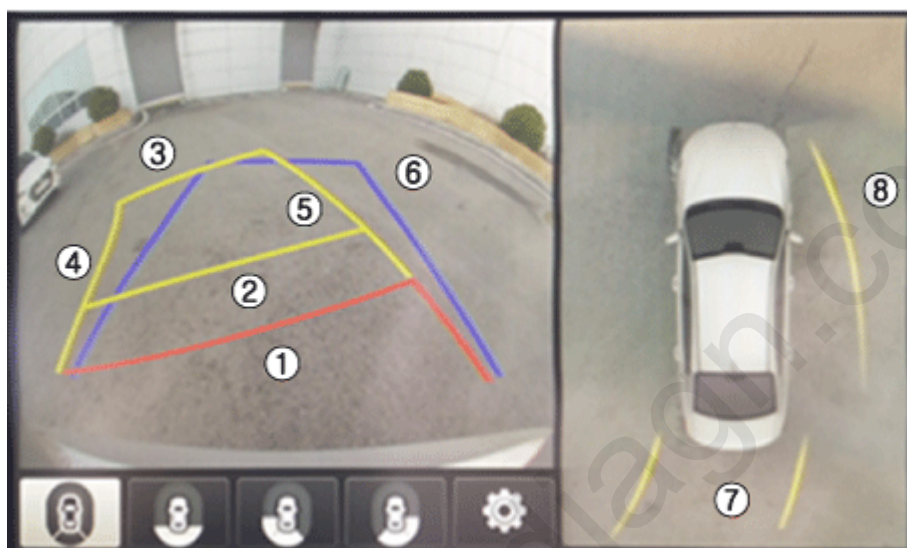
A combination of the rear area that displays 130 degree image of the rear mode (two-split mode) and the expected car movement trace displayed on the wide view is displayed.

1. View modes for guideline steering interlocking indications

Mode	View	Applied area	Notes
Rear	Around view + rear	Rear image (two-split mode)	
	Left rear + rear	Rear image (two-split mode)	
	Right rear + rear	Rear image (two-split mode)	
	Rear wide view	Wide view image	

2. Specifications for guideline steering interlocking trace lines

Description	Number	Distance	Color
Steering wheel interlocking trace lines	①	0.5 m	Red
	②	1.0 m	Yellow
	③	3.0 m	Yellow
	④	Vehicle left side end + 0.3 m	Red + Yellow
	⑤	Vehicle right side end + 0.3 m	Red + Yellow
Neutral trace line	⑥	3.0 m	Blue
Around views mode trace lines	⑦	Around View + 0.3 m	Yellow
	⑧		Yellow



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