

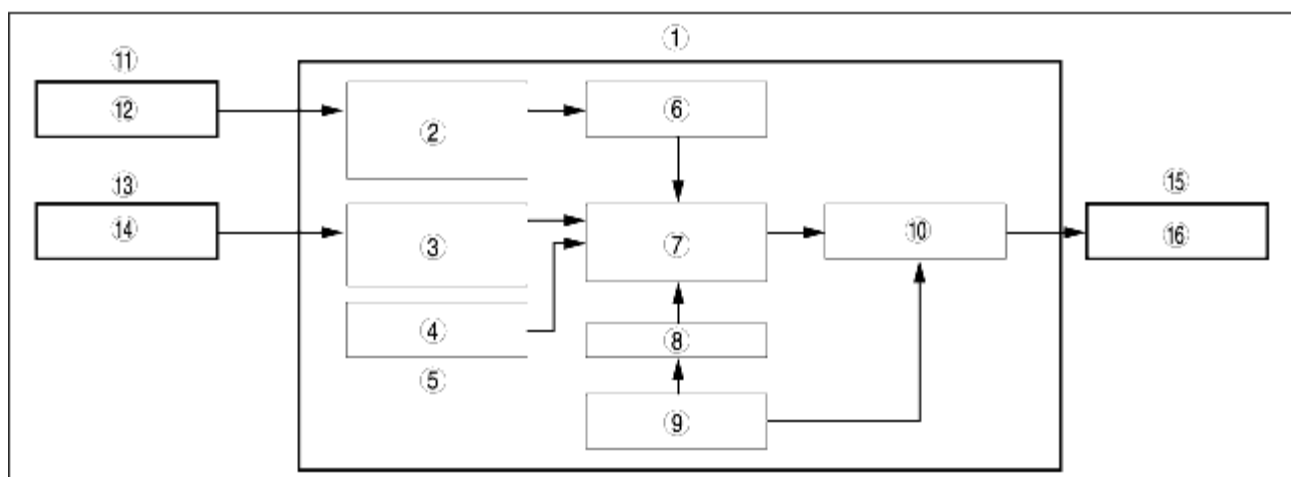
NAVIGATION FUNCTION

B3E092066000T06

Outline

- A vehicle's position is measured by a hybrid method of autonomous navigation (using yaw-rate signals from the gyro sensor and vehicle speed signals from the DSC HU/CM or ABS HU/CM) and GPS navigation (using signals from GPS satellites). Accurate detection of the vehicle's position is possible based on the adoption of a map-matching function which specifies the vehicle's position as compared with the map data read from the DVD-ROM and the vehicle's position measured from autonomous navigation and GPS navigation.
- Guidance to destination is provided via display of the recommended route on the map screen, as well as voice messaging guidance at intersections and points of divergence.
- Based on inputted signals and information on the DVD-ROM, the following features are available:
 - Destination can be selected based on address, intersection, POI (Point of Interest), history, memory or map.
 - Route information is available in map and guide mode.
 - Voice guidance and menus are available in six languages.
 - A map screen that displays maps in twelve steps with scales from 100 m to 500 km.
 - A map screen that displays routes according to Shortest Route and Avoid Motorway functions.
 - A detour function which provides three routes to select from based on streets selected to avoid, up to five via points and calculation of set detour distance.
 - A wide variety of preferential settings are available.

Block Diagram



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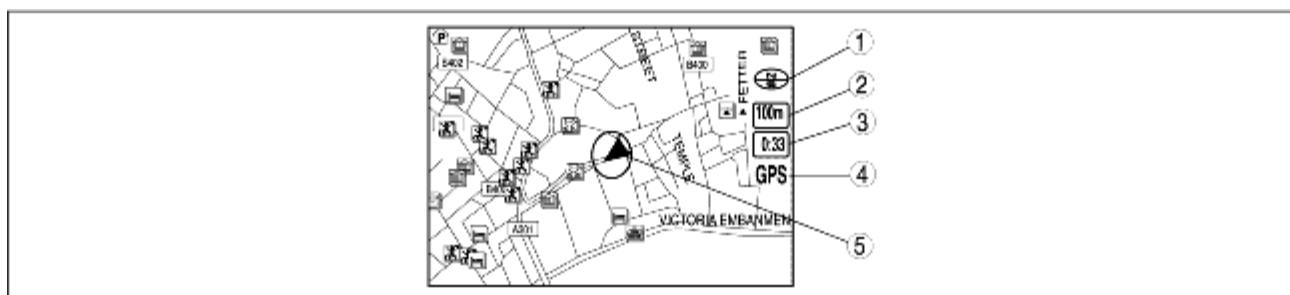
1	Car-navigation unit
2	Detection of current measured position
3	Detection of vehicle travel distance
4	Yaw-rate signal
5	Gyro sensor
6	Correction by GPS
7	Detection of vehicle's position

8	Map data
9	DVD-ROM
10	Map matching
11	GPS antenna
12	Signal from satellite
13	DSC HU/CM or ABS HU/CM
14	Vehicle speed signal
15	LCD unit
16	Display

Map Screen Selection

Current position map

- The location of the vehicle and surrounding area are shown.
- By pressing the [POS] button, the display switches to guide mode. (Only while in route guidance.)



BH-E09.20T117

1	Map orientation
2	Map scale
3	Clock
4	GPS reception indicator (illuminates when receiving signals from 3 or more satellites.)
5	Vehicle position

Scroll map mode

- The scroll map is displayed when operating the joystick on the current position map.
- This map can be scrolled with the crosshair cursor.
- By moving the crosshair cursor to a road and pressing the [ENTER] button, the road name is displayed on the screen.

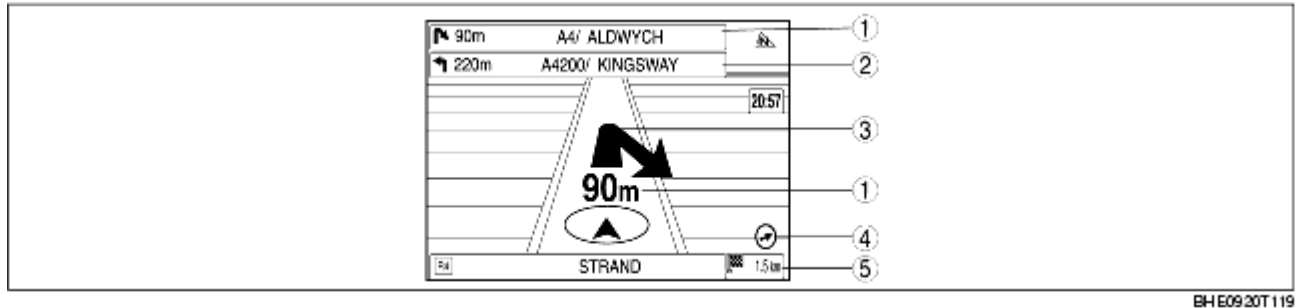


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1 Crosshair cursor

Guide mode

- Displays an enlarged view of the road using an arrow to indicate destination, and also displays route and destination guidance information. (While in route guidance.)
- By pressing the [POS] button, the display switches to the current position map.

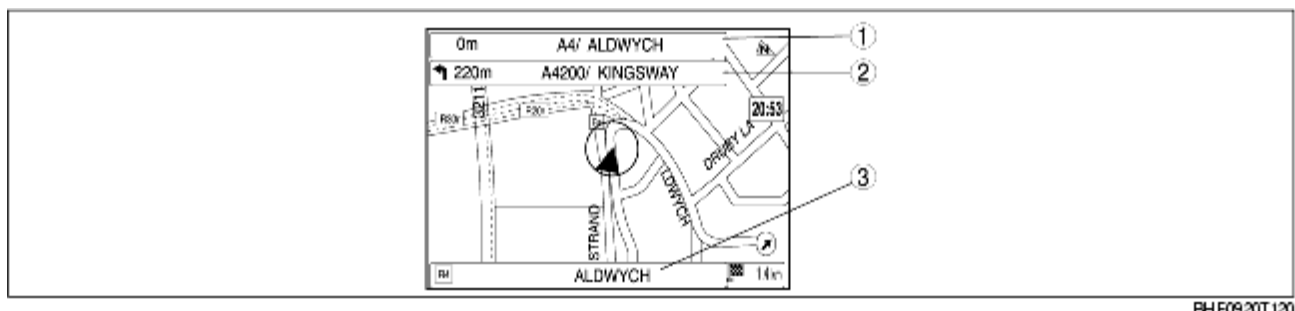


BH E09.20T 119

1	Distance to the next turn
2	Distance to the turn after the next turn
3	Arrow guidance for the next turn
4	Destination direction
5	Destination distance

Intersection zoom map

- An enlarged map is displayed when approaching a roundabout or intersection. (While in route guidance.) Activated by selecting Zoom (On) in setup mode.



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1	Distance to the next turn
2	Distance to the after the next turn
3	Current road name

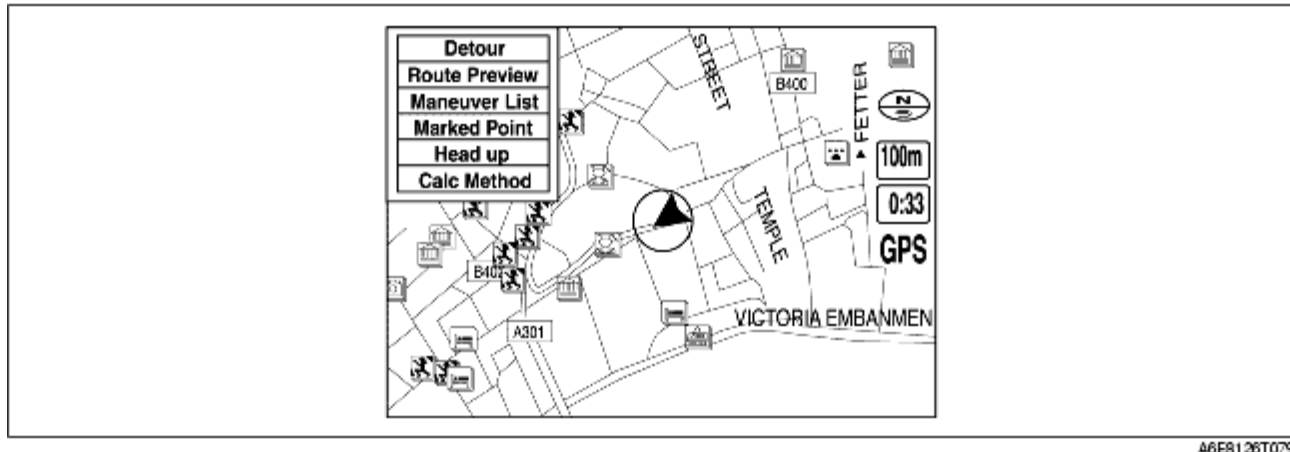
Pop Up Menu

- Pop up menu appears when pressing the [ENTER] button.

- The following items are displayed on the pop up menu. The actual displayed items vary according to the selected map, guidance, and other factors.

Note

- Pop up menu is not available on intersection zoom maps.
- Pop up menu cannot be displayed when the intersection zoom map is displayed.



No.	Contents	Description
1	Detour	Displays route change options. (See Detour function.)
2	Route Preview	Displays complete route preview.
3	Maneuver List	Displays a route list.
4	Marked Point	Registers a point indicated by the crosshair cursor.
5	North up/Head up	Selects either north up or head up map display direction.
6	Stop Calc	Cancels route search.
7	Reroute	Searches for another route to return to the original route when the vehicle has moved away from it. (Appears only when the auto reroute function is inactivated. See Setup Function.)
8	Calc Method	Changes route search settings. (See Whole route search function.)
9	Volume	Adjusts volume of voice guidance.
10	Guidance Off	Selects/cancels voice guidance.
11	Destination	Registers a point indicated by the crosshair cursor as a destination.
12	Nearest POI	Searches for POI's close to current location of the vehicle.

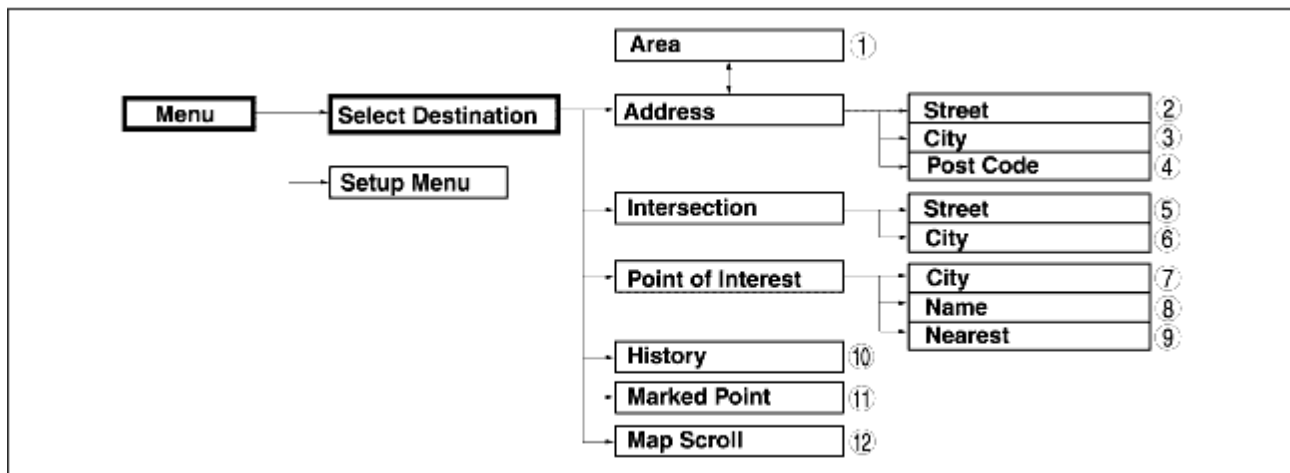
Destination Setting Function

Outline

- The following instructions explain how destinations can be chosen and set.

Note

- A destination can be set to where the crosshair cursor indicates by selecting the Destination option of the scroll map mode pop-menu.



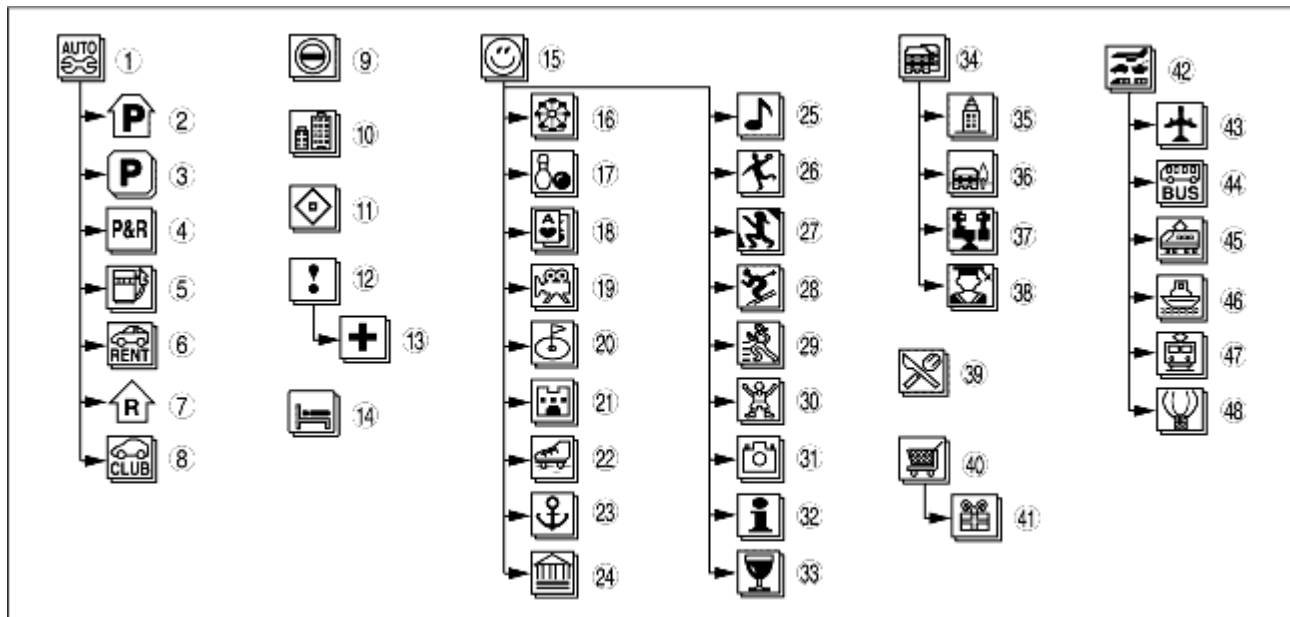
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No.	Contents
1	Changes area set from the previous destination.
2	Sets destination by selecting city name*, inputting street name and selecting house number.
3	Sets destination by inputting city name*, inputting street name and selecting house number.
4	Sets destination by inputting postal code and street name, and selecting house number.
5	Sets intersection as destination by inputting main street name → cross street names.
6	Sets intersection as destination by inputting city name → main street name → cross street names.
7	Sets destination by selecting POI category, inputting city name and selecting POI.
8	Sets destination by selecting POI category, inputting target name and selecting POI.
9	Sets destination from a list of 20 POI destinations closest to the current position (within a radius of 50 km) by inputting POI category and selecting POI.
10	Sets destination from a list of recent destinations. Up to 50 points including the latest starting point are in the system memory.
11	Sets destination from a list of points stored by the user. Up to 100 points can be stored in the memory.
12	Sets destination by moving the crosshair cursor to the destination when in scroll map mode.

* : Memory stores up to 10 cities visited recently, and city names can be selected.

POI categories

• When setting POI destination, the following categories can be selected. Data for categories according to the selected country will be displayed.



B3E09.20T106

1	Auto services
2	Parking garage
3	Open parking area
4	Park & Ride
5	Petrol station
6	Rent a car facility
7	Rest area
8	Motoring organization office
9	Border crossing
10	Business facility
11	City center
12	Emergency
13	Hospital/Polyclinic
14	Hotel or motel
15	Leisure/Recreation
16	Amusement park
17	Bowling center
18	Casino
19	Cinema
20	Golf course
21	Historical monument
22	Ice skating rink
23	Marina
24	Museum
25	Night life
26	Recreation facility
27	Theater
28	Ski resort

29	Sports activity
30	Sports center
31	Tourist attraction
32	Tourist office
33	Winery
34	Public facility
35	City hall
36	Community center
37	Exhibition or conference center
38	University or college
39	Restaurant
40	Shopping
41	Shopping center
42	Transportation
43	Airport
44	Bus station
45	Commuter rail station
46	Ferry terminal
47	Rail way station
48	Public sport airport

Route Search Function

Whole route search function

- After setting a destination, the following route search methods can be used:

No.	Items	Route search method
1	Shortest route setting	• Selects a route according to the shortest distance.
2	Avoid motorway setting	• Selects a route that reduces use of motorways.

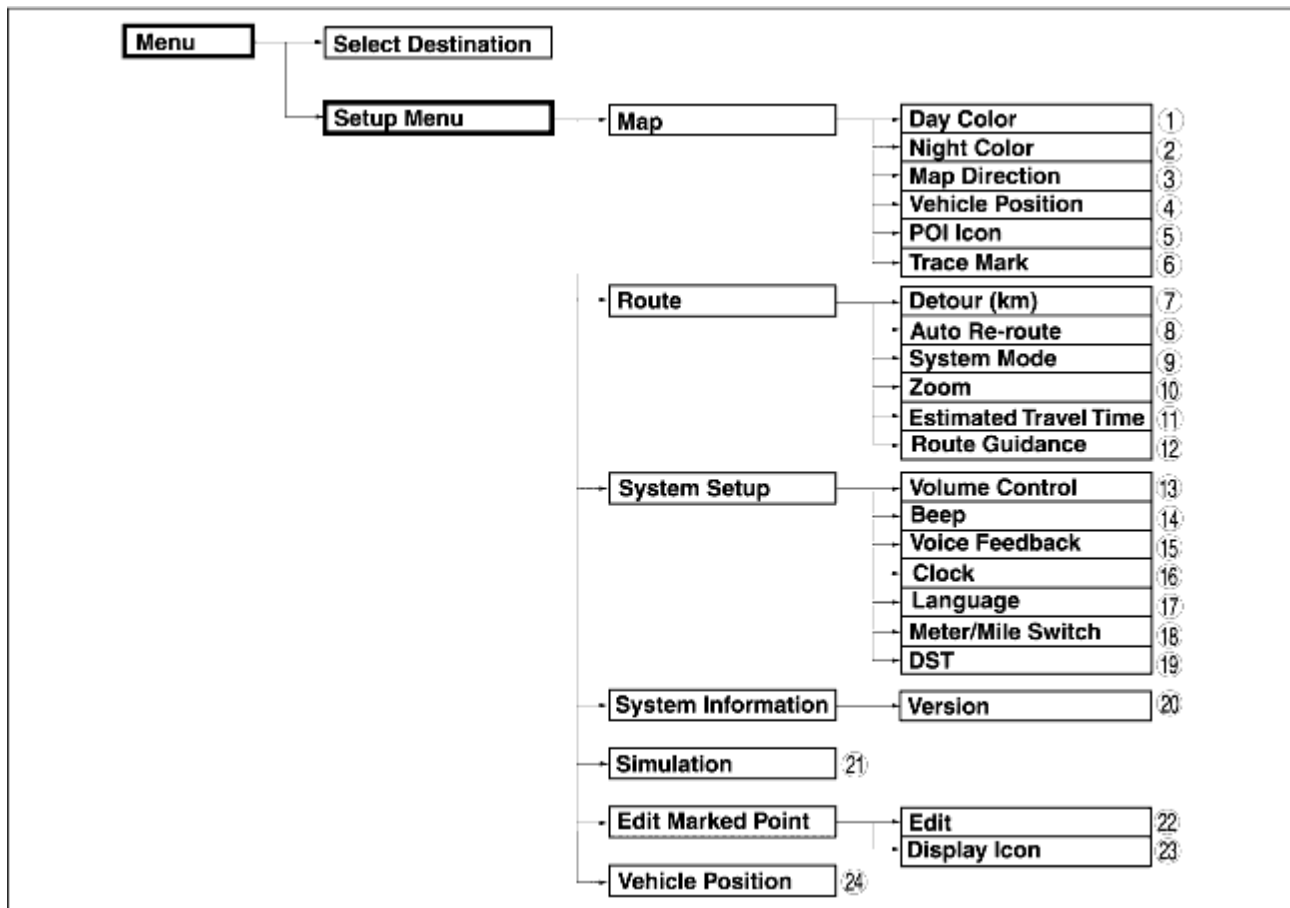
Detour function

- The following settings are available when using the detour function:

No.	Items	Contents
1	Alt route setting	• Searches for a maximum of three routes.
2	Detour distance (xx km) setting	• Calculates a detour for the current route based on inputted (xx km) detour distance. • Detour distance (xx km) is designated in setup (route).
3	Avoid streets setting	• Calculates a detour for the current route to avoid user selected streets.
4	Via point setting	• Selects via points. • Up to five points can be set.

Setup Function

- Map, route and system settings can be changed using this function. Also, system information and route simulation can be displayed.



A6E8126T070

No.	Contents	Selected items	Default
1	Sets map screen color (daytime).	Green, Beige, Black	Beige
2	Sets map screen color (nighttime).	Green, Beige, Black	Beige
3	Sets map direction.	North up, Head up	North up
4	Sets display of the vehicle position indicator on the map screen.	Center: The current vehicle position indicator is displayed in the center of the screen. Off Ctr: The current vehicle position indicator is displayed at the bottom of the screen.	Center
5	Selects/cancels display of the POI icons on the map screen.	On (Icons displayed), Off (Icons not displayed)	On
6	Selects/cancels display of the traced route mark on the map screen.	On (Mark displayed), Off (Mark not displayed)	Off
7	Sets the detour distance for the detour xx km function. If mile are selected in the meter/mile setting, then the distance will be in miles.	1, 2, 5, 10, 20	5
8	Selects/cancels automatic activation of auto re-route function.	On (Automatically activated), Off (Not automatically activated)	On
9	Selects map mode/guide map mode after start-up and route calculation. Guide map mode is displayed only while vehicle is on set route.	Map (Map screen), Guide (Guide mode)	Map
10	Selects/cancels automatic display of intersection zoom map.	On (Automatically displayed), Off (Not automatically displayed)	On

11	Selects/cancels voice guidance announcement of estimated travel time.	On (Makes announcement), Off (No announcement)	On
12	Selects/cancels route guidance. The route will not be deleted if route guidance is disabled.	On (Route guidance enabled), Off (Route guidance disabled)	On
13	Adjusts volume for voice guidance.	0, 1, 2, 3, 4,	2
14	Selects/cancels beeping sound when pressing buttons.	On (Emits beep), Off (No beep)	On
15	Selects/cancels voice guidance.	On (Voice guidance enabled), Off (Voice guidance disabled)	On
16	Selects/cancels display of the clock.	On (Displayed), Off (Not displayed)	Off
17	Sets language used.	GB (English), FRE (French), GER (German), ITA (Italian), SPA (Spanish), DUT (Dutch)	GB
18	Sets unit of measurement used.	Metric (Meters), Imperial (Miles)	Metric
19	Selects/cancels daylight saving time mode.	On (enabled), Off (Disabled)	On
20	Displays map disc and software version/information.	-	-
21	Performs a simulation of a route, after Route setup, from starting point to destination.	-	-
22	Displays detailed information about a marked point from the stored list. The icon and name can be changed, or the marked point can be deleted.	-	-
23	Selects/cancels display of icons on the map.	On (Icons displayed), Off (Icons not displayed)	On
24	Adjusts position and direction of the vehicle on the map display.	-	-

Guidance Function

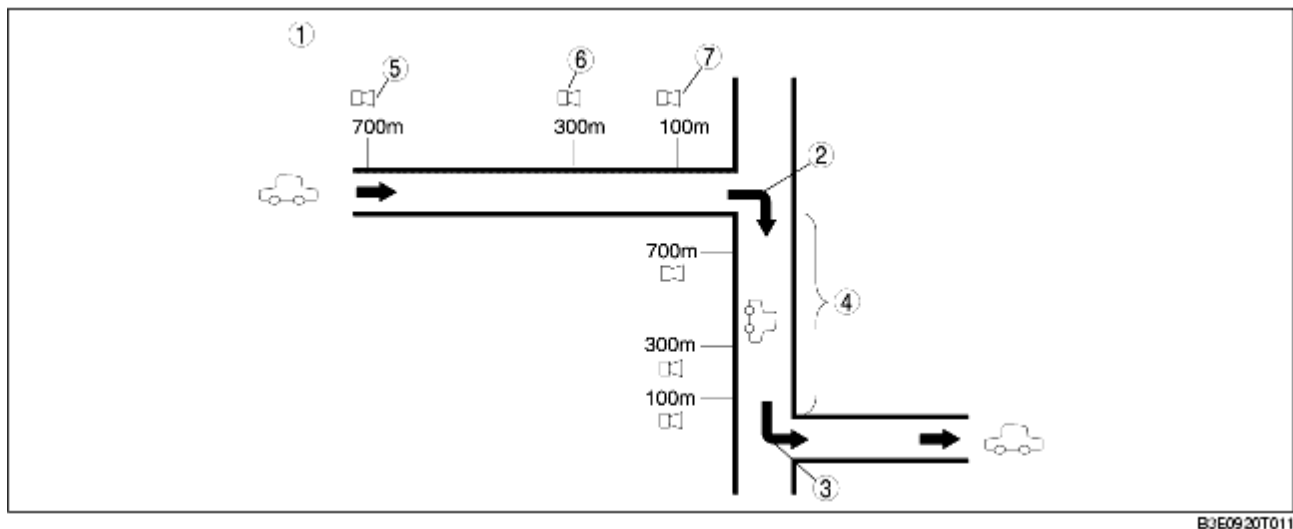
- When using route guidance, the map displays and the system voice announces upcoming intersections, highway entrances/ exits, destination information, and passing via points.

- The types of voice guidance are as follows:

- Normal intersection guidance
- Roundabout guidance
- Highway entrance guidance
- Destination guidance
- Via point guidance.
- Highway exit guidance

Simple junction guidance

- The following voice guidance is provided:

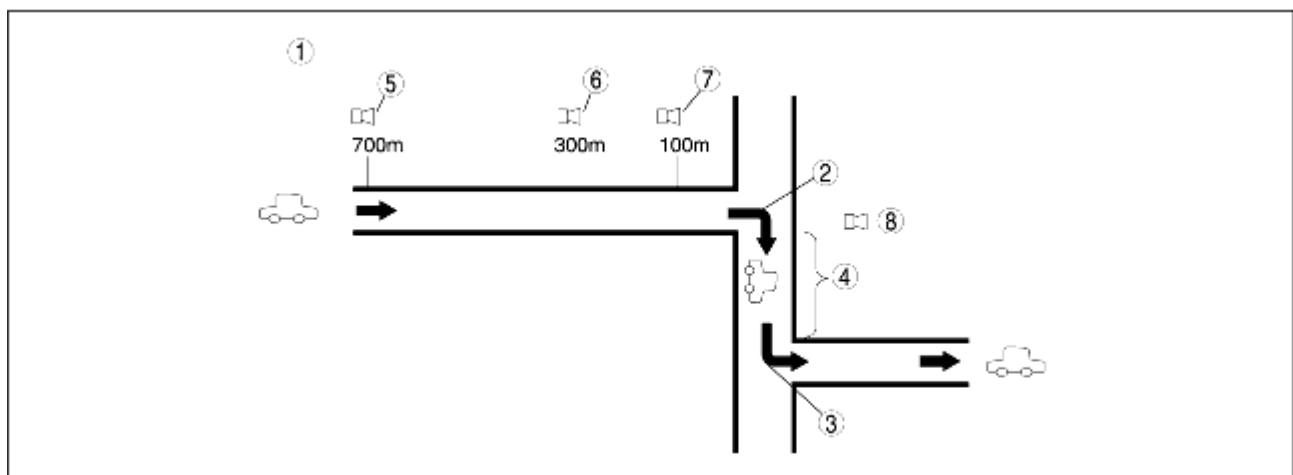


B3E09.20T011

1	Right turn guidance example
2	Right turn point
3	Next turn point
4	X m (X>750 m)
5	In 700 m right turn
6	In 300 m right turn
7	Right turn ahead

Continuous junction guidance

- A continuous junction condition occurs when the distance from the first to the second turn point is more than 150 m and less than or equal to 750 m .
- After passing the first turn point, the next voice guidance is provided.



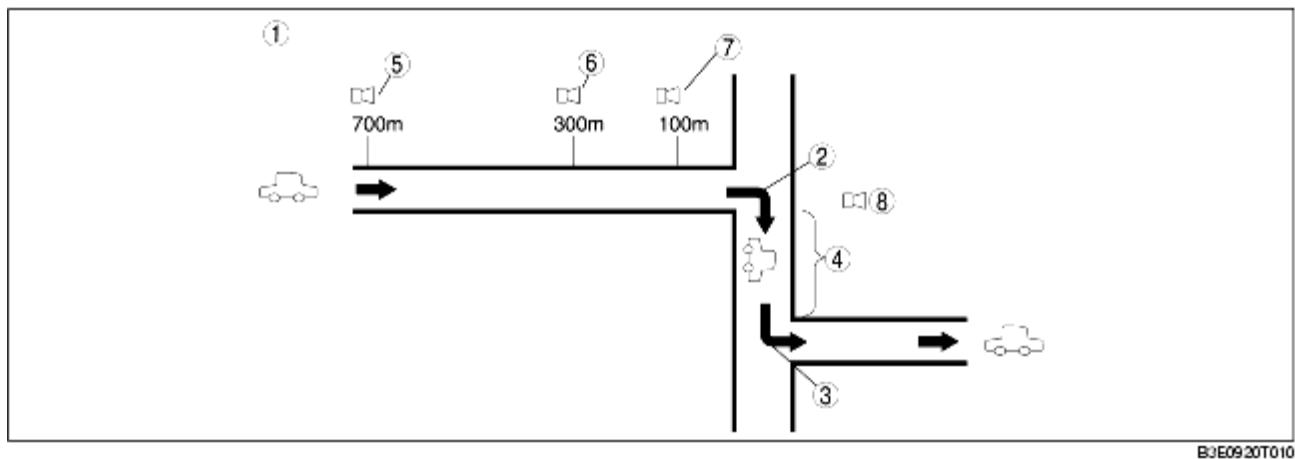
B3E09.20T012

1	Right turn followed by left turn guidance example
2	Right turn point
3	Left turn point

4	X m ($150\text{ m} < X \leq 750\text{ m}$)
5	In 700 meters right turn
6	In 300 meters right turn
7	Right turn ahead
8	In X meters, left turn

Multiple junction guidance

- A multiple junction condition occurs when the distance from the first to the second turn point is less than or equal to 150 m.
- When the last guidance for the first turn point is announced, guidance for the second turn point is also provided.

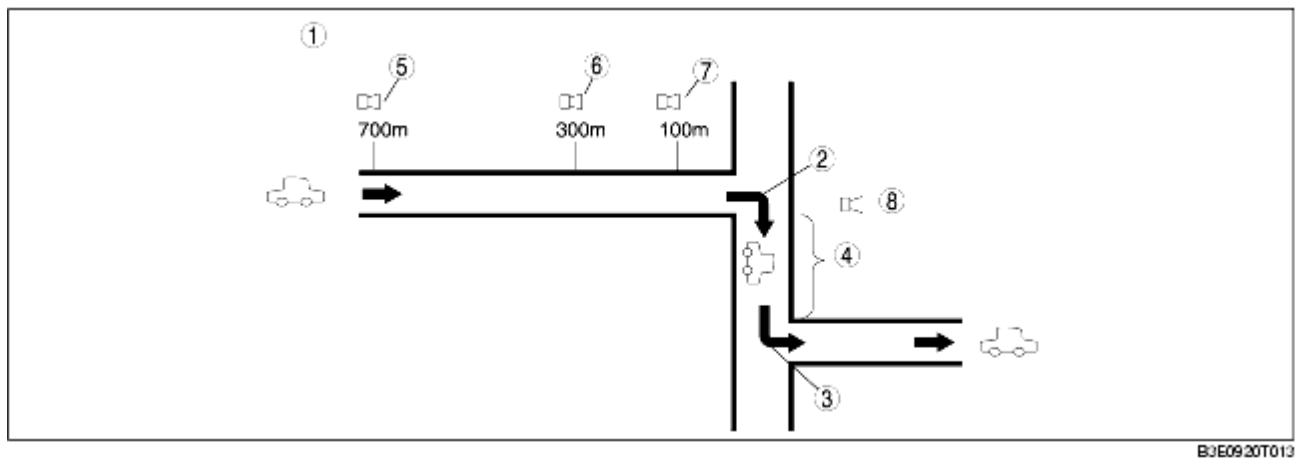


B3E09.20T010

1	Right turn followed by left turn guidance example
2	Right turn point
3	Left turn point
4	X m ($X \leq 150\text{ m}$)
5	In 700 m right turn
6	In 300 m right turn
7	Right turn ahead, then left turn
8	Left turn ahead

Simple highway junction guidance

- The following guidance is provided:

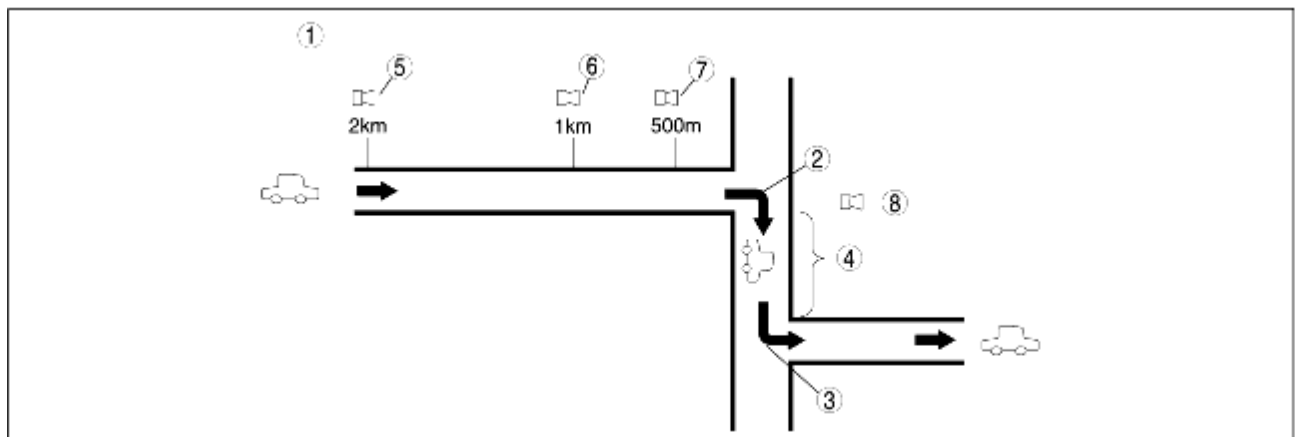


B3E09.20T013

1	Right turn guidance example
2	Right turn point
3	Next turn point
4	X m ($X > 750$ m)
5	In 2 km right turn to exit motorway
6	In 1 km right turn to exit motorway
7	Right turn ahead to exit motorway

Continuous highway junction guidance

- A continuous highway junction condition occurs when the distance from the first to the second turn point is more than 500 m and less than or equal to 750 m.
- After passing the first turn point, the next voice guidance is provided.



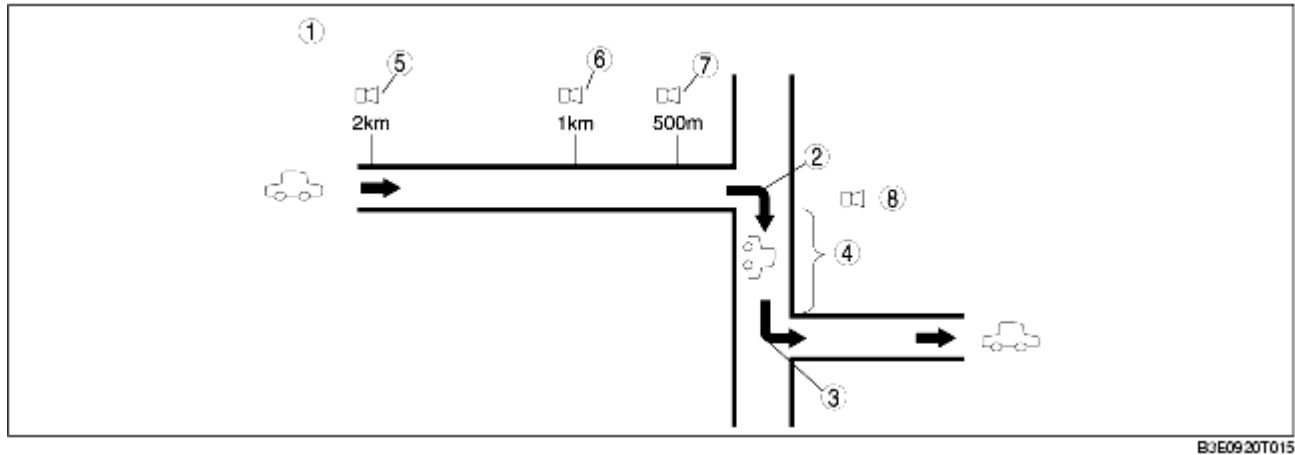
B3E09.20T014

1	Right turn followed by left turn guidance example
2	Right turn point
3	Left turn point
4	X m ($500 \text{ m} < X \leq 750 \text{ m}$)
5	In 2 km right turn to exit motorway
6	In 1 km right turn to exit motorway

7	Right turn ahead to exit motorway
8	In X meters keep left

Multiple highway junction guidance

- A multiple highway junction condition occurs when the distance from the first to the second turn point is less than or equal to 500 m.
- When the last guidance for the first turn point is announced, guidance for the second turn point is also provided.

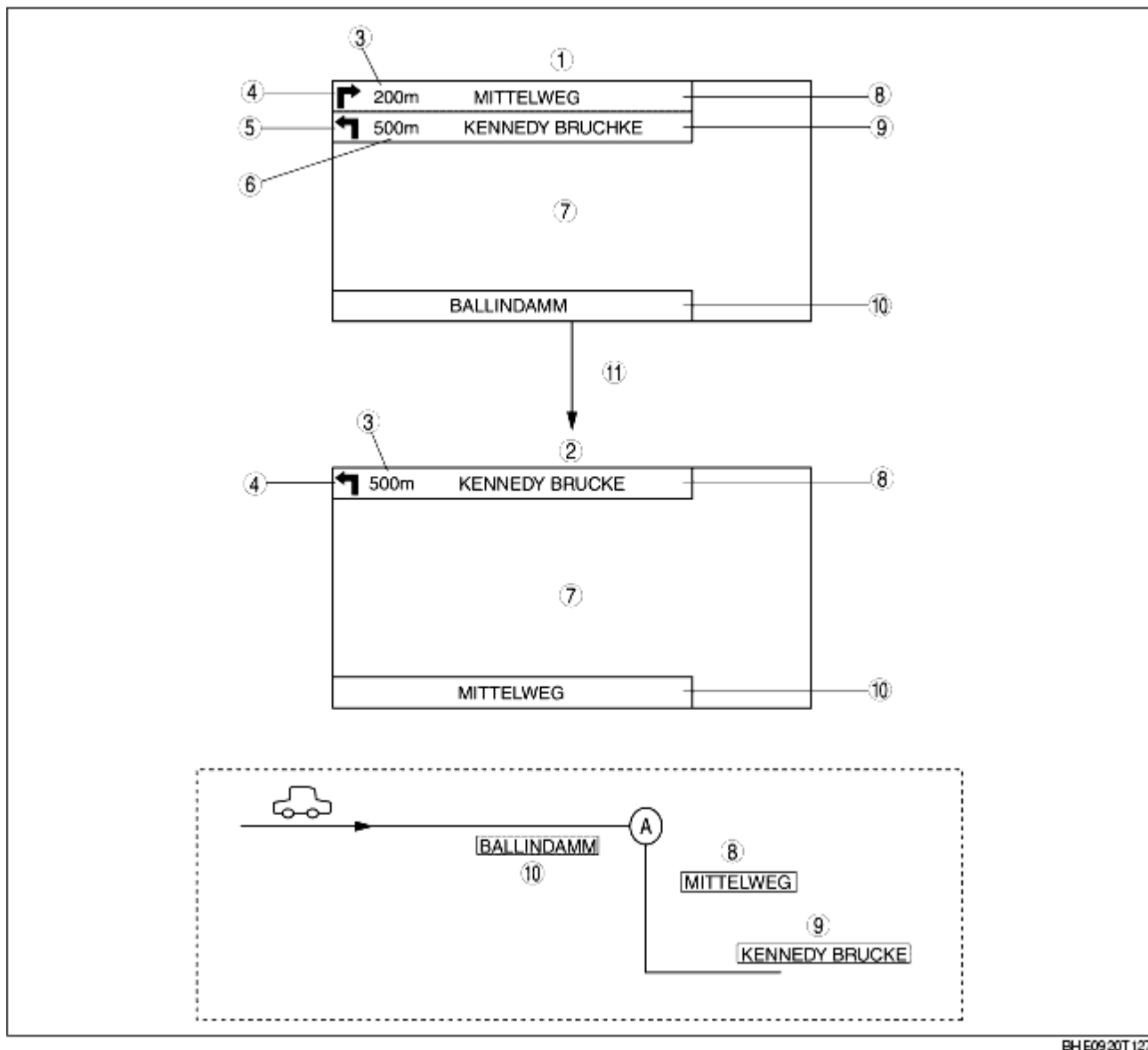


B3E09.20T015

1	Right turn followed by left turn guidance example
2	Right turn point
3	Left turn point
4	X m ($X \leq 500$ m)
5	In 2 km right turn to exit motorway
6	In 1 km right turn to exit motorway
7	Right turn ahead to exit motorway then keep left
8	Keep left ahead

Intersection Distance Display

- When approaching the next guidance point, the distance to that point is counted down.
- In case of a continuous or multiple junction, guidance point bars for the next two turns will be displayed.
- In case of a continuous or multiple junction, after the first turn point is passed the following occurs:
 1. Next turn guidance point bar → Current road
 2. Turn after next turn guidance point bar → Next turn guidance point bar



BHE09.20T127

1	Continuous, multiple junction
2	Simple junction
3	Distance to the next turn
4	Shape of the next turn
5	Shape of the turn after the next turn
6	Distance to the turn after the next turn
7	Current map screen
8	Name of the next road
9	Name of the road after the next road
10	Name of the current road
11	Vehicle arriving at point A

Operation While Driving Display Function

Screen activation

- The following operation while driving warning screen appears when the unit determines from the signal of the DSC HU/CM or ABS HU/CM that the vehicle is moving.



A6ES126T076

Activation condition

- When driving and the following screens are displayed, operating the following buttons will activate the warning screen.

No.	Items		Screen contents/Cursor position	Indicated buttons
1	Menu screen		Menu screen, destination setting screen, set up screen	[Joystick], [ENTER], [ZOOM], [MENU]
2	Current position map screen, scroll map screen	No pop-up	-	[Joystick], [MENU]
		Pop-up	Detour, Destination, Nearest POI Route Preview, Maneuver List, Marked Point, Head up/North up, Calc Method, Reroute, Volume, Guidance Off	[ENTER], [MENU] [MENU]
3	Guide mode map screen	No pop-up	-	[MENU]
		Pop-up	Detour Route Preview, Maneuver List, Marked Point, Calc Method, Reroute, Volume, Guidance Off	[ENTER], [MENU] [MENU]
4	Intersection zoom map		-	[MENU]