SECTION SN
SONAR SYSTEM

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PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:0000000013611614

Risk of injury

There is a risk of injury caused by parts becoming projectiles if uncontrolled deployment of air bag or seat belt pre-tensioner occurs, or by storing air bag with the deployment side facing downwards. When scrapping air bag or seat belt pre-tensioner by means of controlled deployment, there is also a danger present if a sufficiently safe distance is not maintained, or if opening using cutting torches or other cutting tools, or due to smelting or if parts that are not yet triggered are exposed to a blaze or a smoldering fire at landfills.

Safety instructions/precautions

- Removed air bag must always be stored with deployment side facing up.
- Acquisition, transportation, storage, testing and assembly work should only be performed or supervised by properly trained personnel.
- Install air bag or seat belt pre-tensioner immediately following retrieval from storage.
- Air bag and seat belt pre-tensioner must be protected from flying sparks, open fires and temperature exceeding 100°C (212°F).
- Never transport air bag and seat belt pre-tensioner in the passenger compartment. Store them securely in the luggage room of the vehicle in their original replacement part packaging and secure them so that they cannot slip around.
- Never allow air bag and seat belt pre-tensioner to come into contact with grease, oil, or cleaning agents.
- Perform system tests using approved testing equipment only, and only when the units are properly installed and the vehicle is unoccupied.
- Before the initial hookup of the battery or an external power supply, the ignition must be switched on and the vehicle unoccupied.
- Air bag and seat belt pre-tensioner that fall from a height of more than 0.5 m must be replaced.
- When scrapping by means of controlled deployment of air bag and seat belt pre-tensioner, a safe distance of at least 10 m must be maintained.
- Before starting work on air bag and seat belt pre-tensioner and work on components that are connected to air bag and seat belt pre-tensioner or require and intervention in their electric circuit (e.g. when removing the steering wheel):
- Disconnect any external power sources (e.g. charger).
- Disconnect and insulate ground line of battery
- Before starting bodywork in combination with welding or retrofitting, during which work is performed on uninsulated, current-carrying lines or require an intervention in their electric circuit (e.g. when removing the steering wheel):
- Disconnect any external power sources (e.g. charger).
- Disconnect and insulate ground line of battery.
- During welding, disconnect plug connection and from control unit of air bag.
- When the air bag deploys, the pyrofuse activates and the power source from the battery is disconnected. This prevents possible fires caused by electric leakage after an accident occurs.

Precautions for Removing Battery Terminal

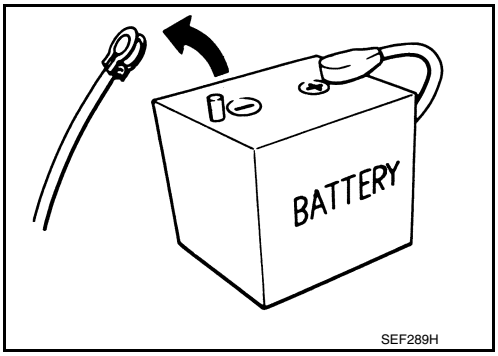
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When disconnecting the battery terminal, pay attention to the following.

- Always use a 12V battery as power source.
- Never disconnect battery terminal while engine is running.

- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
- For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

BR08DE	: 4 minutes	YD25DDTi	: 2 minutes
D4D engine	: 20 minutes	YS23DDT	: 4 minutes
HRA2DDT	: 12 minutes	YS23DDTT	: 4 minutes
K9K engine	: 4 minutes	ZD30DDTi	: 60 seconds
M9R engine	: 4 minutes	ZD30DDTT	: 60 seconds
R9M engine	: 4 minutes		
V9X engine	: 4 minutes		



NOTE:
ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

- After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

NOTE:
- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- Example of high-load driving
  - Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
  - Driving for 30 minutes or more on a steep slope.

- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

NOTE:
If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

NOTE:
The removal of 12V battery may cause a DTC detection error.

PREPARATION

PREPARATION

Lubricant or/and Sealant

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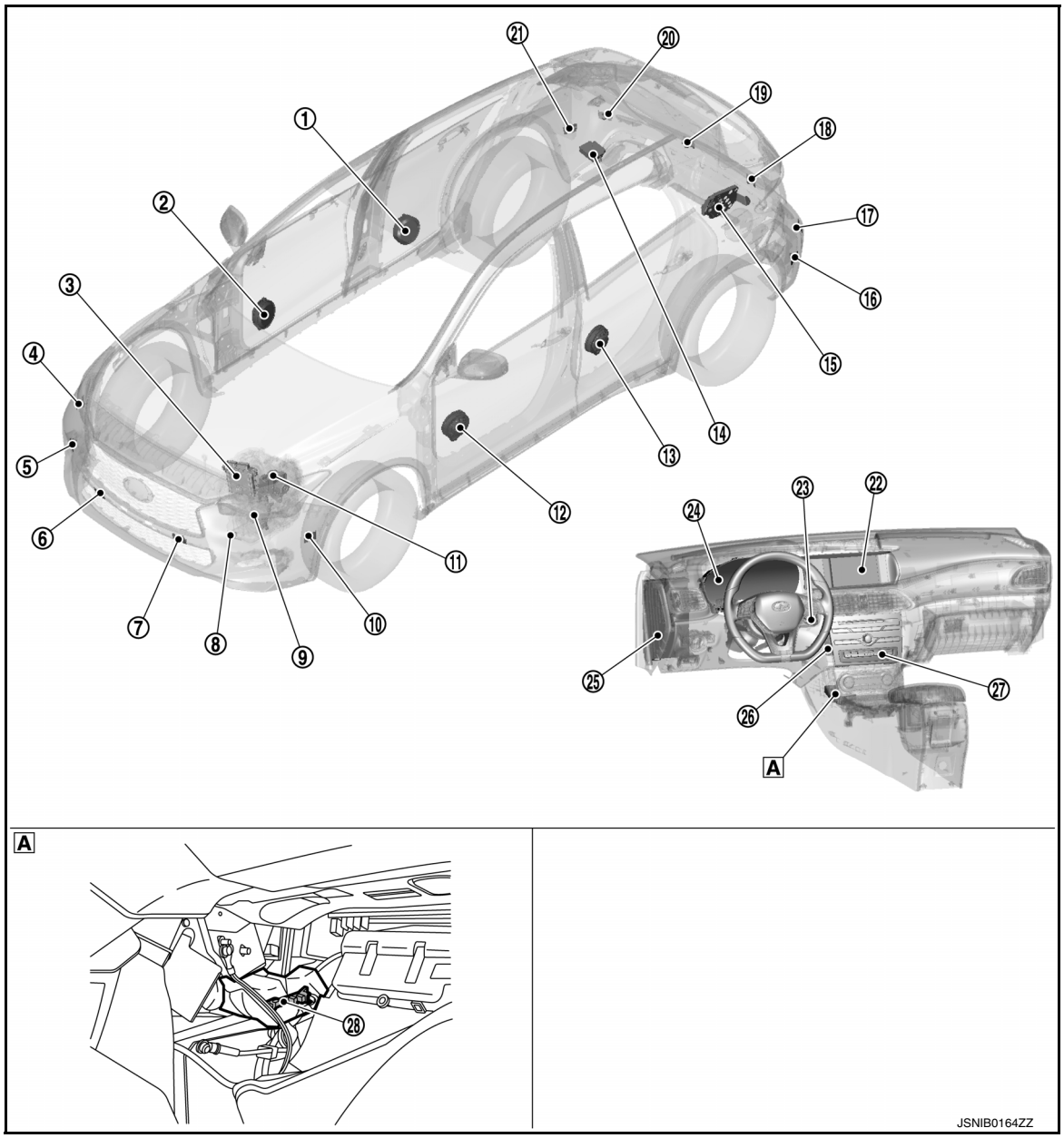
Name	Description	Note
Primer (Sumitomo 3M K-540NT or equivalent)	Primer for attaching sonar sensor holder to bumper	Sumitomo 3M Limited

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

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No.	Component	Function
①	Rear door speaker RH	Receive sound signals (buzzer) and sound buzzer.
②	Front door speaker RH	Receive sound signals (buzzer) and sound buzzer.
③	ECM	Transmits CAN communication signal. Refer to EC-27, "Component Parts Location", for detailed installation.
④	Side sensor front RH	Refer to SN-9, "Sonar Sensor".
⑤	Corner sensor front RH	Refer to SN-9, "Sonar Sensor".
⑥	Center sensor front RH	Refer to SN-9, "Sonar Sensor".
⑦	Center sensor front LH	Refer to SN-9, "Sonar Sensor".

No.	Component	Function
⑧	Corner sensor front LH	Refer to SN-9, "Sonar Sensor".
⑨	TCM	Transmits CAN communication signal. Refer to TM-17, "Component Parts Location", for detailed installation.
⑩	Side sensor front LH	Refer to SN-9, "Sonar Sensor".
⑪	Electronic stability program control unit	Transmits CAN communication signal. Refer to BRC-29, "Component Parts Location", for detailed installation.
⑫	Front door speaker LH	Receive sound signals (buzzer) and sound buzzer.
⑬	Rear door speaker LH	Receive sound signals (buzzer) and sound buzzer.
⑭	Electric parking brake control module	Transmits CAN communication signal. Refer to PB-7, "Component Parts Location", for detailed installation.
⑮	Around view monitor control unit	When receiving a sonar indicator display signal from the sonar control unit, the around view monitor control unit synthesizes sonar indicator with a camera image and transmits to display control unit. Refer to AV-264, "Component Parts Location", for detailed installation.
⑯	Side sensor rear LH	Refer to SN-9, "Sonar Sensor".
⑰	Corner sensor rear LH	Refer to SN-9, "Sonar Sensor".
⑱	Center sensor rear LH	Refer to SN-9, "Sonar Sensor".
⑲	Center sensor rear RH	Refer to SN-9, "Sonar Sensor".
⑳	Corner sensor rear RH	Refer to SN-9, "Sonar Sensor".
㉑	Side sensor rear RH	Refer to SN-9, "Sonar Sensor".
㉒	Display control unit	• When receiving a sonar indicator display signal from the sonar control unit, the around view monitor control unit synthesizes sonar indicator with a camera image. (Models with around view monitor system) • Sonar indicator display signal that is received from sonar control unit is displayed in the display. (Models without around view monitor system) • Outputs sound signal (buzzer) to AV control unit.
㉓	Electronic ignition switch control unit	Transmits CAN communication signal.
㉔	Combination meter	Transmits CAN communication signal.
㉕	BCM	Transmits/Receives CAN communication signal. Refer to BCS-8, "BODY CONTROL SYSTEM : Component Parts Location", for detailed installation.
㉖	AV control unit	Inputs sound signal from display control unit, and outputs sound signal (buzzer) to each speaker. Refer to AV-13, "WITHOUT BOSE SYSTEM : Component Parts Location" (without BOSE system) or AV-14, "WITH BOSE SYSTEM : Component Parts Location" (with BOSE system) for detailed installation location.
㉗	Upper control panel control unit (sonar system switch)	Refer to SN-9, "Sonar System Switch".
㉘	Sonar control unit	Refer to SN-7, "Sonar Control Unit".

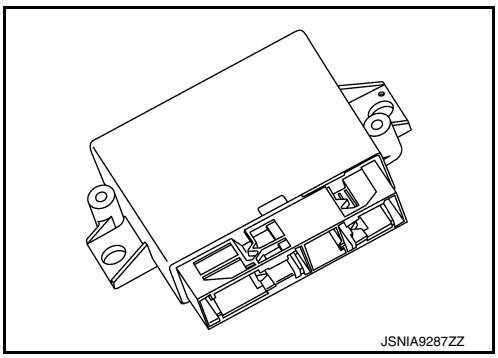
Sonar Control Unit

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DESCRIPTION

Location

The sonar control unit is located on the transmission tunnel below the A/C housing.



Task

The sonar control unit actuates the sonar system or park assist (models with park assist) and does the following:

- Reading in of sensors
- Evaluation of input factors
- Actuation of components
- Output of signals

Reading in of sensors

The input factors are read in via the following connections:

- Direct line
- CAN communication

Direct line

The signals from the following components are read via direct lines:

- Side sensor front LH
- Corner sensor front LH
- Center sensor front LH
- Center sensor front RH
- Corner sensor front RH
- Side sensor front RH
- Side sensor rear RH
- Center sensor rear RH
- Center sensor rear LH
- Side sensor rear LH
- Corner sensor rear LH
- Corner sensor rear RH

CAN communication

The following information is read in over the CAN communication:

- Circuit 15 status
- Status of parking brake
- Status of reverse gear
- Data of rain/light sensor
- Status of sonar system switch
- Signals from left front axle rpm sensor
- Signals from right front axle rpm sensor
- Signals from left rear axle rpm sensor
- Signals from right rear axle rpm sensor
- Steering wheel angle sensor signals (with park assist)
- Combination switch position (with park assist)
- Signals of left multifunction steering wheel button group (with park assist)
- Steering gear toothed rack travel (with park assist)
- Active Parking Assist status (with park assist)

The functions that use these signals are described in the individual function descriptions (see system diagram).

Evaluation of input factors

The input factors that have been read in are evaluated by the integrated microprocessor and the relevant components are then actuated.

Actuation of components

The following components are actuated via direct lines:

- Sonar system distance sensors

Output of signals

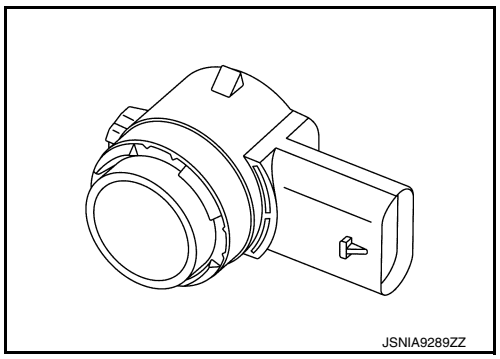
The sonar control unit sends the following signals over the CAN communication:

- Issue acoustic warning request
- Display parking system request status
- Electric power steering request (with park assist)
- Raise/lower brake pressure request (with park assist), with transmission
- Buzzer output signal
- Sonar indicator display signal

Sonar Sensor

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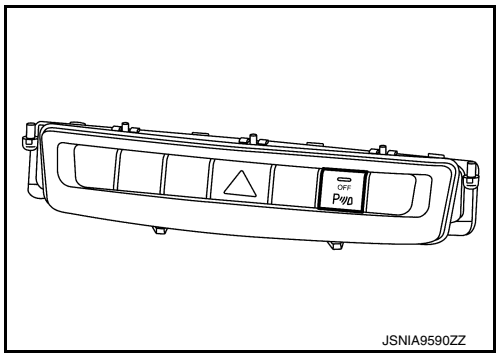
When a distance from an obstacle is detected, a distance signal is transmitted to the sonar control unit.



Sonar System Switch

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The sonar system switch on the lower side of the instrument panel center allows the driver to turn the sonar system on and off. To turn the sonar system on and off, the ignition switch must be in the ON position. The indicator light on the switch will illuminate when the system is turned off. The sonar system will turn on automatically when the ignition switch is turned from the OFF position to the ON position.



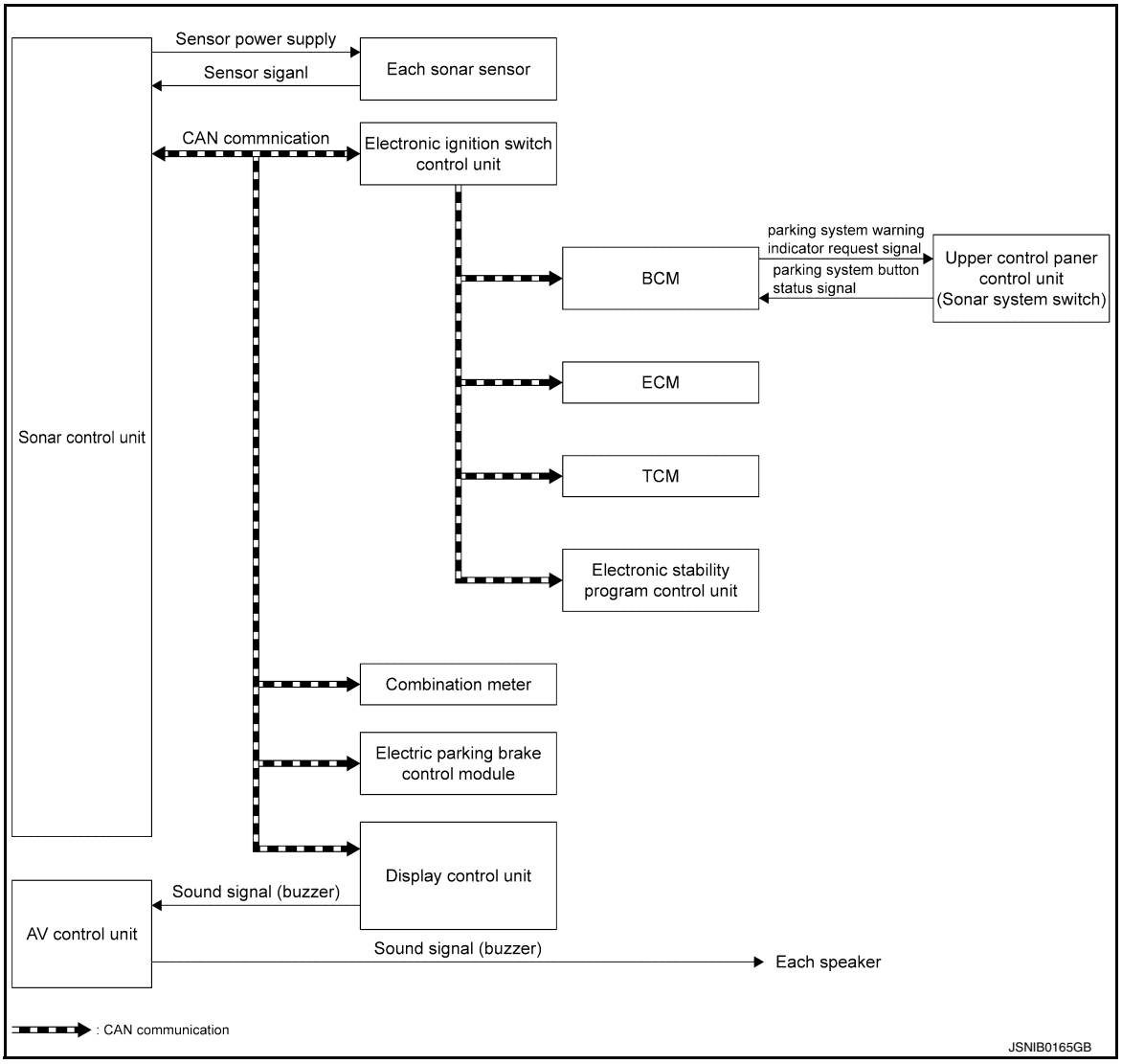
SYSTEM

SONAR SYSTEM (FRONT 6 & REAR 4 SENSORS)

SONAR SYSTEM (FRONT 6 & REAR 4 SENSORS) : System Description

INFOID:0000000013611624

SYSTEM DIAGRAM



Sonar Control Unit Input Signal (CAN Communication)

Transmit unit	Signal name
ECM	Reverse gear status signal
TCM	
Electronic ignition switch control unit	Circuit 15 status ON signal
Electronic stability program control unit	Wheel rotation direction signal
	Wheel speed signal
BCM	Parking system button status signal
	Dusk setting signal
Combination meter	Vehicle speed signal
	Parking system status signal
Electric parking brake control module	Parking brake status signal

Sonar Control Unit Output Signal (CAN Communication)

Transmit unit	Signal name
BCM	Parking system status indicator request signal
Display control unit	Sonar indicator display signal
	Buzzer output signal

DESCRIPTION

The sonar control unit consists of the sonar system which assist the driver when maneuvering and parking.

The sonar system includes the following sub-functions:
- Measuring procedure function sequence
- Self-test function sequence
- Behavior in the event of over-voltage and under-voltage function sequence
- Activate and deactivate function sequence
- Function sequence for monitoring reverse travel
- Function sequence for monitoring forward travel

Function Requirements, General

Ignition switch ON

NOTE:

The electronic ignition switch control unit sends the status of circuit 15 via the CAN communication the sonar control unit.

Sonar System, General
- Sonar system uses an ultrasonic measuring procedure to record the distance between the vehicle and an obstacle. On the basis of the distance values determined in this way, it warns the driver of obstacles during a parking space entry procedure or supports him when maneuvering in a small area.
- The distance between the vehicle and the obstacle is indicated to the driver visually and acoustically.
  NOTE:
  In certain situations warnings from the sonar system are suppressed, e.g. when reversing through narrow passages (driveway). There is an obstacle within the detection range but, based on the current steering wheel position, a collision will not take place.
- Sonar system operation is dependent on speed and direction of travel, and therefore the following input factors have to be determined:
- Direction of travel and vehicle speed
- Engaged gear range

Direction of travel and vehicle speed:
- Information on direction of travel and vehicle speed are derived from the wheel speed and wheel rotation direction signals. The Electronic Stability Program control unit sends this information via the CAN communication, electronic ignition switch control unit and CAN communication to the sonar control unit and to the combination meter. The sonar control unit calculates the vehicle speed and defines the direction of travel. At the same time, the combination meter also calculates the vehicle speed to be displayed and sends it via the CAN communication to the sonar control unit.

Engaged gear range:
- The request to “Engage gear range R” is defined by the corresponding selector lever position. The TCM sends the selector lever position via the CAN communication, ECM and CAN communication to the electronic ignition switch control unit. Irrespective of the transmission variant, the electronic ignition switch control unit generates the “reverse gear engaged” signal based on the incoming information and sends this signal via the CAN communication to the sonar control unit.

MEASURING PROCEDURE FUNCTION SEQUENCE
- The sonar system is based on the ultrasonic measuring procedure. As such, the sonar control unit actuate the sonar sensors directly.
- As a result of this these emit an ultrasonic signal. The ultrasonic waves reflected by an obstacle are received again by the sonar sensors. The sonar control unit directly reads in the signals of the sonar sensors and evaluates them. In principle a distinction is made between two measurements. On the one hand the direct measurement, resulting from a direct echo and on the other hand the indirect distance measurement which is achieved via a cross echo. Echoes can usually also be received from adjacent sonar sensors due to the large sonar sensor detection angles; these are known as cross echoes. These occur at the obstacle due to

scattered reflection. The distance between the vehicle and obstacle can be calculated from two echo signals using the triangulation method. The propagation times of the signals from the direct measurement and from the cross measurement are required for this method. A long signal runtime thus equals a long distance between the vehicle and the obstacle, a short signal runtime equals a short distance between the vehicle and the obstacle.

NOTE:
The sonar system cannot work correctly in certain cases due to the function principle (transmitting and receiving sound waves). So for example, when approaching a strong sound absorbent obstacle (e.g. a vehicle covered in snow) it is possible that false data may be displayed.

SELF-TEST FUNCTION SEQUENCE

The Following Components Are Checked For Proper Operation:
- Sonar control unit
- Sonar sensors
- Parking assist electrical lines

Sonar Control Unit Self-test:
- The sonar control unit performs a self test after the ignition is switched on (circuit 15 ON). In the process, the hardware of the sonar control unit is tested.
  NOTE:
  The self-test is performed irrespective of the selector lever position of the automatic transmission.
- The sonar system control unit carries out further self-tests at regular intervals.
- The following states can be recorded here:
- Operational malfunction
- System error(s)
- If a malfunction or system error occurs, the sonar system is deactivated and the LED in the sonar system switch in the upper control panel control unit lights up.
- For this purpose, the sonar control unit sends a corresponding request to the upper control panel control unit via the CAN communication, electronic ignition switch control unit, CAN communication, BCM and battery sensor LIN. The upper control panel control unit then actuates the LED directly.

Sonar Sensor Self-test:
- A self-test of the sonar sensors (e.g. for connection) is only performed when a sonar sensor is “pulsed” (ultrasonic transmitting).
  NOTE:
  The self-test is performed irrespective The self-test is performed depending on the selector lever position of the automatic transmission and the speed.
- Sonar sensor test for subsequent vibrations:
  The test is performed cyclically.

Malfunction:
A malfunction can be caused by a temporary external disturbance (e.g. a jackhammer on a construction site, a steam jet or by driving through an automatic car wash). If the malfunction persists for a longer period of time, identification of the cause takes place during driving operation by means of a self-test. If the malfunction is still present, this is interpreted as a system error.
NOTE:
A warning sound is not emitted.

System Error:

A system error can have the following causes:
- Malfunctioning component
- Error in communication
- Over-voltage or under-voltage

If a system error or a malfunction in the sonar sensors is detected through a function test during operation, an error message is displayed on the display screen. The sonar control unit additionally sends a request to issue a warning tone to the display control unit via the CAN communication. The display control unit then actuates the warning buzzer directly. The display control unit issues a warning tone for t = 3 s, the sonar system switches itself off and a malfunction is entered in the DTC memory of the sonar control unit.
NOTE:
The size of the license plate bracket attached to the bumper varies depending on the national version. Due to the different dimensions and shapes the sonar system must be adapted to the particular circumstances. A

diagnostic tester can be used to code the national version to prevent malfunction caused by the license plate bracket.

BEHAVIOR IN THE EVENT OF OVERVOLTAGE AND UNDERVOLTAGE FUNCTION SEQUENCE

The sonar system behavior in the event of over-voltage or under-voltage is described in the following table.

Battery power supply voltage U < 9.0 V	Battery power supply voltage U > 16.0 V	Under-voltage with reset	Under-voltage without reset (start pulse)
Sonar system nonfunctional	Sonar system nonfunctional	The function is activated again after a reset	Display distance
No function test, if voltage returns to normal	No function test, if voltage returns to normal	—	—
LED in the sonar system switch ON	LED in the sonar system switch ON	—	—

ACTIVATE AND DEACTIVATE FUNCTION SEQUENCE

Additional Function Requirements For Activation And Deactivation

- Self-test completed successfully
- Transmission not in gear range “D” or “R” engaged

NOTE:
If the parking brake is activated and gear range “N” is engaged, the sonar system is active for t = 2 s before it is automatically switched off. The electric parking brake control unit sends the status of the parking brake via the CAN communication to the sonar control unit.

Deactivate And Activate Function Sequence

The sonar system can be manually deactivated or activated by pressing the sonar system switch in the upper control panel. The upper control panel control unit reads in the status of the sonar system switch directly and sends it to the sonar control unit via the battery sensor LIN, BCM, electronic ignition switch control unit and CAN communication.

NOTE:
If the sonar system function has been switched off manually using the sonar system switch, it is automatically switched on again when ignition switch is activated again.

- When the sonar system is deactivated, only the LED in the sonar system switch lights up.
- In driving operation, the sonar system switches into “Standby mode” between v = 60 and 16 km/h (37 and 10 MPH), i.e. the sonar control unit and the sonar sensors are supplied with power.

FUNCTION SEQUENCE FOR MONITORING REVERSE TRAVEL

- Vehicle speed v = 0 to 18 km/h (0 to 11 MPH) or vehicle speed v = 16 to 0 km/h (10 to 0 MPH)
- Backward movement of vehicle

Function Sequence For Monitoring Reverse Travel

- During reverse travel the areas in front of and behind the vehicle are monitored. When the lower limit speed of v = 16 km/h (10 MPH) is dropped below, the sonar system changes to measuring mode. When obstacles are detected in front of or behind the vehicle, the driver is first warned visually by the displays a warning on sonar indicator in three stages (green, yellow, and red), according to a distance from an obstacle. The sonar control unit actuates the sonar system warning indicators directly.
- When a distance of s = 35 cm (13.8 in) is dropped below, the warning is then intensified by an intermittent tone and subsequently by a continuous signal emitted integrated in the sonar system warning indicators (see the obstacle detection distance). When the upper speed limit of v = 18 km/h (11MPH) is exceeded, the sonar system goes over into stand by mode again.

FUNCTION SEQUENCE FOR MONITORING FORWARD TRAVEL

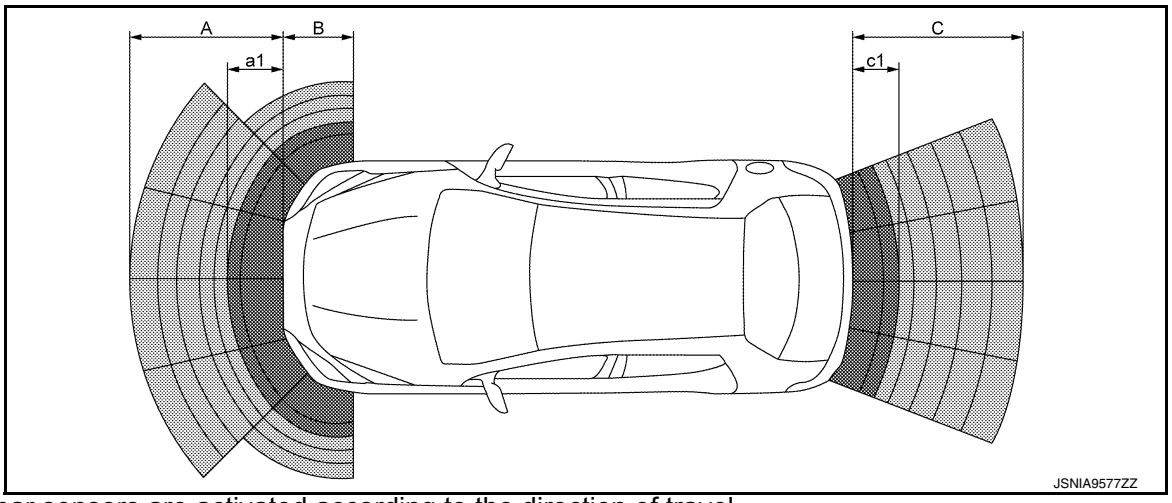
- Vehicle speed v = 0 to 18 km/h (0 to 11 MPH) or vehicle speed v = 16 to 0 km/h (10 to 0 MPH)
- Forward movement of vehicle

Function Sequence For Monitoring Forward Travel

When driving forwards the area in front of the vehicle is monitored.
When the lower limit speed of v = 16 km/h (10 MPH) is dropped below, the forward movement of vehicle sonar system changes to measuring mode. When obstacles are detected in front of the vehicle, the driver is first warned visually by the displays a warning on sonar indicator in three stages (green, yellow, and red), according to a distance from an obstacle.

When a distance of s = 35 cm (13.8 in) is dropped below, the warning is then intensified by an intermittent tone and subsequently by a continuous signal emitted integrated in the sonar system warning indicator (see the obstacle detection distance). When a speed of v = 18 km/h (11 MPH) is exceeded, the sonar system switches back to standby mode.

OBSTACLE DETECTION DISTANCE



The sonar sensors are activated according to the direction of travel.

During forward travel, the sonar sensors for the following monitoring ranges are activated:
- Front monitoring range (A).
- Corner safeguarding, front monitoring range (B)

During reverse travel, the sonar sensors for the following monitoring ranges are activated:
- Front monitoring range (A)
- Corner safeguarding, front monitoring range (B)
- Rear monitoring range (C)

The monitoring ranges are defined as follows:
- Monitored range, front: s = 100 cm (39.3 in)
- Monitored range, rear: s = 120 cm (47.2 in)

If the distance of the vehicle to an obstacle is less than s = 20 cm (7.9 in) (a1, c1), the sonar system will not obtain any more defined data for technical reasons.

Front Sensor Detection Distance

Detection distance (default value)

Waning messages front monitoring range				
Warning Level	Warning indicator	Warning buzzer	Distance (cm, in)	
			Corner sensor front RH, LR Center sensor front RH, LH	Side sensor front RH, LH
Level 1	Red	Continuous signal	0 - 35 cm (0 in - 13.78 in)	0 - 35 cm (0 in - 13.78 in)
Level 2	Yellow	10.0 Hz	35 - 44 cm (13.78 in - 17.32 in)	35 - 44 cm (13.78 in - 17.32 in)
	Yellow	8.0 Hz	45 - 54 cm (17.72 in - 21.26 in)	45 - 54 cm (17.72 in - 21.26 in)
Level 3	Green	6.7 Hz	55 - 64 cm (21.65 in - 25.20 in)	55 - 64 cm (21.65 in - 25.20 in)
	Green	5.7 Hz	65 - 74 cm (25.59 in - 29.13 in)	—

Waning messages front monitoring range

Warning Level	Warning indicator	Warning buzzer	Distance (cm, in)	
			Corner sensor front RH, LR Center sensor front RH, LH	Side sensor front RH, LH
Level 4	Green	—	75 - 84 cm (29.53 in - 33.07 in)	—
	Green	—	85 - 94 cm (33.46 in - 37.00 in)	—
	Green	—	95 - 104 cm (37.40 in - 40.94 in)	—
No detection	—	—	More than 105 cm (41.34 in)	More than 65 cm (25.59 in)

Detection distance (FAR)

Waning messages front monitoring range

Warning Level	Warning indicator	Warning buzzer	Distance (cm, in)	
			Corner sensor front RH, LR Center sensor front RH, LH	Side sensor front RH, LH
Level 1	Red	Continuous signal	0 - 35 cm (0 in - 13.78 in)	0 - 35 cm (0 in - 13.78 in)
Level 2	Yellow	10.0 Hz	35 - 44 cm (13.78 in - 17.32 in)	35 - 44 cm (13.78 in - 17.32 in)
	Yellow	8.0 Hz	45 - 54 cm (17.72 in - 21.26 in)	45 - 54 cm (17.72 in - 21.26 in)
Level 3	Green	6.7 Hz	55 - 64 cm (21.65 in - 25.20 in)	55 - 64 cm (21.65 in - 25.20 in)
	Green	5.7 Hz	65 - 74 cm (25.59 in - 29.13 in)	65 - 74 cm (25.59 in - 29.13 in)
Level 4	Green	—	75 - 84 cm (29.53 in - 33.07 in)	—
	Green	—	85 - 94 cm (33.46 in - 37.00 in)	—
	Green	—	95 - 104 cm (37.40 in - 40.94 in)	—
	Green	—	105 - 114 cm (41.33 in - 44.88 in)	—
No detection	—	—	More than 115 cm (45.28 in)	More than 75 cm (29.53 in)

Detection distance (NEAR)

Waning messages front monitoring range

Warning Level	Warning indicator	Warning buzzer	Distance (cm, in)	
			Corner sensor front RH, LR Center sensor front RH, LH	Side sensor front RH, LH
Level 1	Red	Continuous signal	0 - 35 cm (0 in - 13.78 in)	0 - 35 cm (0 in - 13.78 in)
Level 2	Yellow	10.0 Hz	35 - 44 cm (13.78 in - 17.32 in)	35 - 44 cm (13.78 in - 17.32 in)
	Yellow	8.0 Hz	45 - 54 cm (17.72 in - 21.26 in)	45 - 54 cm (17.72 in - 21.26 in)
Level 3	Green	6.7 Hz	55 - 64 cm (21.65 in - 25.20 in)	55 - 64 cm (21.65 in - 25.20 in)
	Green	5.7 Hz	65 - 74 cm (25.59 in - 29.13 in)	—

Waning messages front monitoring range

Warning Level	Warning indicator	Warning buzzer	Distance (cm, in)	
			Corner sensor front RH, LR Center sensor front RH, LH	Side sensor front RH, LH
Level 4	Green	—	75 - 84 cm (29.53 in - 33.07 in)	—
	Green	—	85 - 94 cm (33.46 in - 37.00 in)	—
No detection	—	—	More than 95 cm (37.40 in)	More than 65 cm (25.59 in)

Rear Sensor Detection Distance

Detection distance (default value)

Waning messages rear monitoring range

Warning Level	Warning indicator	Warning buzzer	Distance (cm, in)
			Corner sensor rear RH, LR Center sensor rear RH, LH
Level 1	Red	Continuous signal	0 - 35 cm (0 in - 13.78 in)
Level 2	Yellow	10.0 Hz	35 - 44 cm (13.78 in - 17.32 in)
	Yellow	8.0 Hz	45 - 54 cm (17.72 in - 21.26 in)
Level 3	Green	6.7 Hz	55 - 64 cm (21.65 in - 25.20 in)
	Green	5.7 Hz	65 - 74 cm (25.59 in - 29.13 in)
Level 4	Green	5.0 Hz	75 - 84 cm (29.53 in - 33.07 in)
	Green	4.4 Hz	85 - 94 cm (33.46 in - 37.00 in)
	Green	4.0 Hz	95 - 104 cm (37.40 in - 40.94 in)
	Green	3.6 Hz	105 - 114 cm (41.33 in - 44.88 in)
	Green	3.3 Hz	115 - 124 cm (45.28 in - 48.82 in)
	Green	3.1 Hz	125 - 134 cm (49.21 in - 52.76 in)
	Green	2.9 Hz	135 - 144 cm (53.15 in - 56.69 in)
	Green	2.7 Hz	145 - 154 cm (57.09 in - 60.63 in)
No detection	—	—	More than 155 cm (61.02 in)

Detection distance (FAR)

Waning messages rear monitoring range

Warning Level	Warning indicator	Warning buzzer	Distance (cm, in)
			Corner sensor rear RH, LR Center sensor rear RH, LH
Level 1	Red	Continuous signal	0 - 35 cm (0 in - 13.78 in)
Level 2	Yellow	10.0 Hz	35 - 44 cm (13.78 in - 17.32 in)
	Yellow	8.0 Hz	45 - 54 cm (17.72 in - 21.26 in)
Level 3	Green	6.7 Hz	55 - 64 cm (21.65 in - 25.20 in)
	Green	5.7 Hz	65 - 74 cm (25.59 in - 29.13 in)
Level 4	Green	5.0 Hz	75 - 84 cm (29.53 in - 33.07 in)
	Green	4.4 Hz	85 - 94 cm (33.46 in - 37.00 in)
	Green	4.0 Hz	95 - 104 cm (37.40 in - 40.94 in)
	Green	3.6 Hz	105 - 114 cm (41.33 in - 44.88 in)
	Green	3.3 Hz	115 - 124 cm (45.28 in - 48.82 in)
	Green	3.1 Hz	125 - 134 cm (49.21 in - 52.76 in)
	Green	2.9 Hz	135 - 144 cm (53.15 in - 56.69 in)
	Green	2.7 Hz	145 - 154 cm (57.09 in - 60.63 in)
	Green	2.7 Hz	155 - 164 cm (61.02 in - 64.56 in)
No detection	—	—	More than 165 cm (64.96 in)

Detection distance (NEAR)

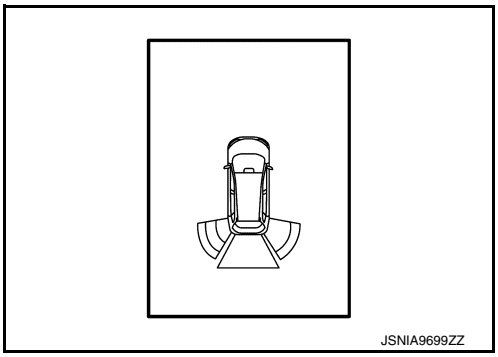
Waning messages rear monitoring range

Warning Level	Warning indicator	Warning buzzer	Distance (cm, in)
			Corner sensor rear RH, LR Center sensor rear RH, LH
Level 1	Red	Continuous signal	0 - 35 cm (0 in - 13.78 in)
Level 2	Yellow	10.0 Hz	35 - 44 cm (13.78 in - 17.32 in)
	Yellow	8.0 Hz	45 - 54 cm (17.72 in - 21.26 in)
Level 3	Green	6.7 Hz	55 - 64 cm (21.65 in - 25.20 in)
	Green	5.7 Hz	65 - 74 cm (25.59 in - 29.13 in)

Waning messages rear monitoring range			
Warning Level	Warning indicator	Warning buzzer	Distance (cm, in)
			Corner sensor rear RH, LR Center sensor rear RH, LH
Level 4	Green	5.0 Hz	75 - 84 cm (29.53 in - 33.07 in)
	Green	4.4 Hz	85 - 94 cm (33.46 in - 37.00 in)
	Green	4.0 Hz	95 - 104 cm (37.40 in - 40.94 in)
	Green	3.6 Hz	105 - 114 cm (41.33 in - 44.88 in)
	Green	3.3 Hz	115 - 124 cm (45.28 in - 48.82 in)
	Green	3.1 Hz	125 - 134 cm (49.21 in - 52.76 in)
	Green	2.9 Hz	135 - 144 cm (53.15 in - 56.69 in)
No detection	—	—	More than 145 cm (57.09 in)

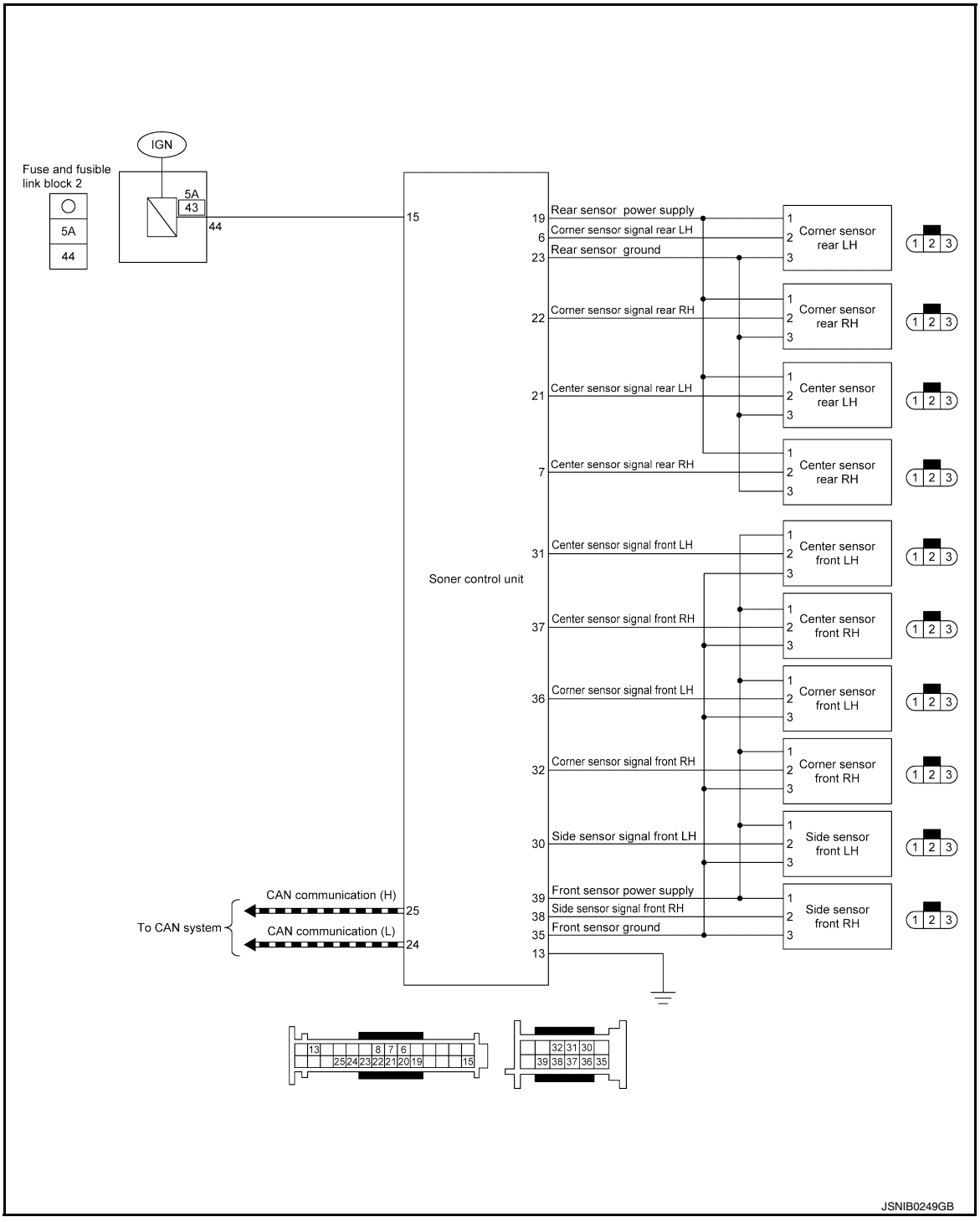
SONAR INDICATOR

- Sonar indicator is displayed on the audio display.
- The sonar control unit displays a warning on sonar indicator in three stages (green, yellow, and red), according to a distance from an obstacle.



SONAR SYSTEM (FRONT 6 & REAR 4 SENSORS) : Circuit Diagram

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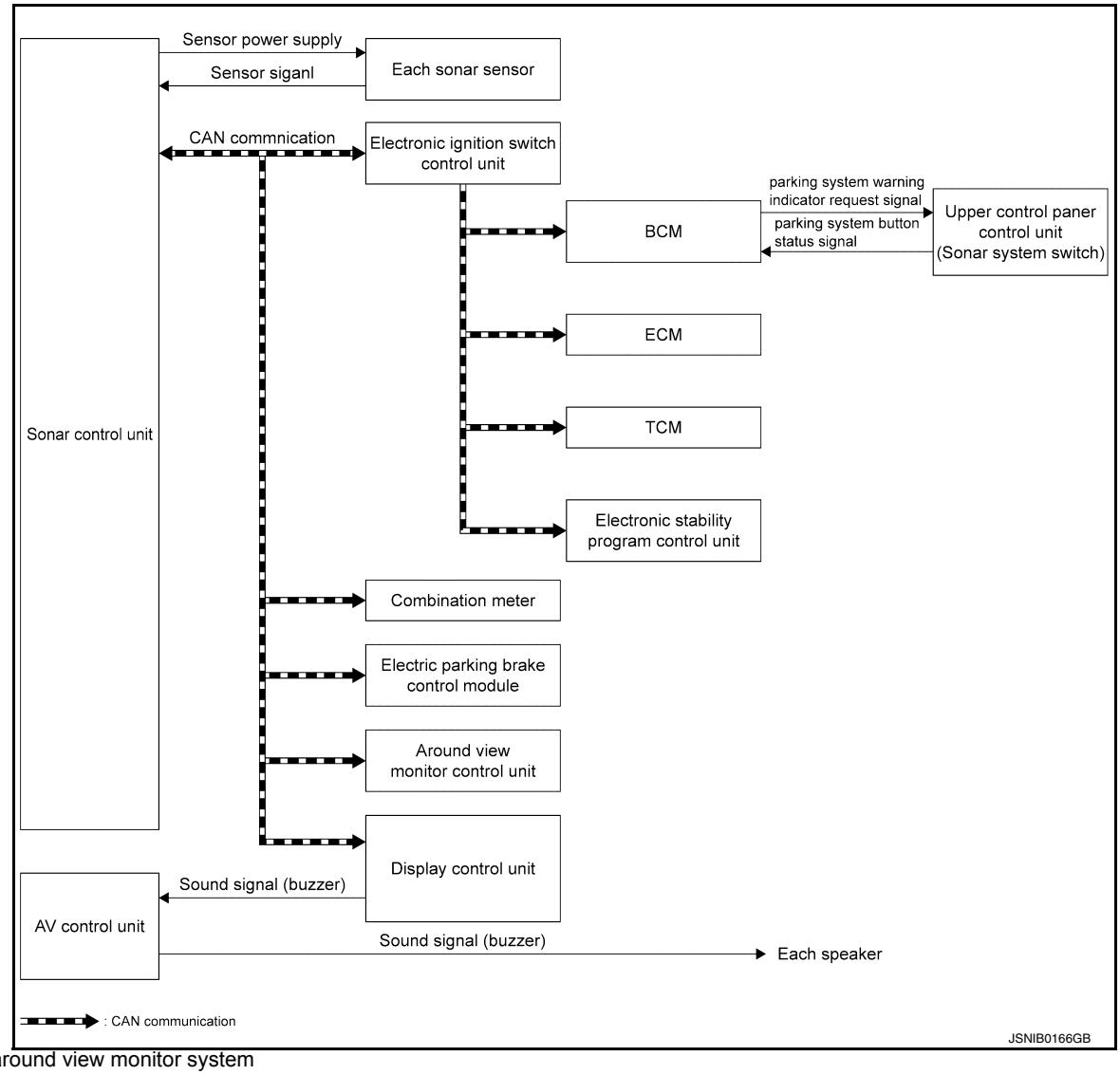
SONAR SYSTEM (FRONT 6 & REAR 6 SENSORS WITH PARK ASSIST)

SONAR SYSTEM (FRONT 6 & REAR 6 SENSORS WITH PARK ASSIST) : System

Description

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SYSTEM DIAGRAM



*: With around view monitor system

Sonar Control Unit Input Signal (CAN Communication)

Transmit unit	Signal name
ECM	Reverse gear status signal
TCM	
Electronic ignition switch control unit	Circuit 15 status ON signal
Electronic stability program control unit	Wheel rotation direction signal
	Wheel speed signal
BCM	Sonar system switch status signal
	Dusk setting signal
Combination meter	Vehicle speed signal
	Sonar system status signal
Electric parking brake control module	Parking brake status signal

Sonar Control Unit Output Signal (CAN Communication)

Transmit unit	Signal name
BCM	Sonar system status indicator request signal
Around view monitor control unit (with around view monitor system)	Sonar indicator display signal
Display control unit	Sonar indicator display signal
	Buzzer output signal

DESCRIPTION

The sonar control unit consists of the sonar system and the park assist which assist the driver when maneuvering and parking.

The sonar system includes the following sub-functions:
- Measuring procedure function sequence
- Self-test function sequence
- Behavior in the event of over-voltage and under-voltage function sequence
- Activate and deactivate function sequence
- Function sequence for monitoring reverse travel
- Function sequence for monitoring forward travel

Park assist system includes the following sub-functions:
- Function sequence for parking space detection
- Function sequence for display of possible parking spaces on multifunction display
- Function sequence for semi-automatic parking space entry
- Function sequence for semi-automatic parking space exit

NOTE:
For detailed park assist system functions, refer to DAS-185, "System Description".

Function Requirements, General

Ignition switch ON

NOTE:
The electronic ignition switch control unit sends the status of circuit 15 via the CAN communication the sonar control unit.

Sonar System, General
- Sonar system uses an ultrasonic measuring procedure to record the distance between the vehicle and an obstacle. On the basis of the distance values determined in this way, it warns the driver of obstacles during a parking space entry procedure or supports him when maneuvering in a small area.
- The distance between the vehicle and the obstacle is indicated to the driver visually and acoustically.
  NOTE:
  In certain situations warnings from the sonar system are suppressed, e.g. when reversing through narrow passages (driveway). There is an obstacle within the detection range but, based on the current steering wheel position, a collision will not take place.
- Sonar system operation is dependent on speed and direction of travel, and therefore the following input factors have to be determined:

- Direction of travel and vehicle speed
- Engaged gear range

Direction of travel and vehicle speed:
- Information on direction of travel and vehicle speed are derived from the wheel speed and wheel rotation direction signals. The Electronic Stability Program control unit sends this information via the CAN communication, electronic ignition switch control unit and CAN communication to the sonar control unit and to the combination meter. The sonar control unit calculates the vehicle speed and defines the direction of travel. At the same time, the combination meter also calculates the vehicle speed to be displayed and sends it via the CAN communication to the sonar control unit.

Engaged gear range:
- The request to “Engage gear range R” is defined by the corresponding selector lever position. The TCM sends the selector lever position via the CAN communication, ECM and CAN communication to the electronic ignition switch control unit. Irrespective of the transmission variant, the electronic ignition switch control unit generates the “reverse gear engaged” signal based on the incoming information and sends this signal via the CAN communication to the sonar control unit.

MEASURING PROCEDURE FUNCTION SEQUENCE

- The sonar system is based on the ultrasonic measuring procedure. As such, the sonar control unit actuate the sonar sensors directly.
- As a result of this these emit an ultrasonic signal. The ultrasonic waves reflected by an obstacle are received again by the sonar sensors. The sonar control unit directly reads in the signals of the sonar sensors and evaluates them. In principle a distinction is made between two measurements. On the one hand the direct measurement, resulting from a direct echo and on the other hand the indirect distance measurement which is achieved via a cross echo. Echoes can usually also be received from adjacent sonar sensors due to the large sonar sensor detection angles; these are known as cross echoes. These occur at the obstacle due to scattered reflection. The distance between the vehicle and obstacle can be calculated from two echo signals using the triangulation method. The propagation times of the signals from the direct measurement and from the cross measurement are required for this method. A long signal runtime thus equals a long distance between the vehicle and the obstacle, a short signal runtime equals a short distance between the vehicle and the obstacle.

NOTE:
The sonar system cannot work correctly in certain cases due to the function principle (transmitting and receiving sound waves). So for example, when approaching a strong sound absorbent obstacle (e.g. a vehicle covered in snow) it is possible that false data may be displayed.

SELF-TEST FUNCTION SEQUENCE

The Following Components Are Checked For Proper Operation:

- Sonar control unit
- Sonar sensors
- Parking assist electrical lines

Sonar Control Unit Self-test:

- The sonar control unit performs a self test after the ignition is switched on (circuit 15 ON). In the process, the hardware of the sonar control unit is tested.
  NOTE:
  The self-test is performed irrespective of the selector lever position of the automatic transmission.
- The sonar system control unit carries out further self-tests at regular intervals.
- The following states can be recorded here:
- Operational malfunction
- System error(s)
- If a malfunction or system error occurs, the sonar system is deactivated and the LED in the sonar system switch in the upper control panel control unit lights up.
- For this purpose, the sonar control unit sends a corresponding request to the upper control panel control unit via the CAN communication, electronic ignition switch control unit, CAN communication, BCM and battery sensor LIN. The upper control panel control unit then actuates the LED directly.

Sonar Sensor Self-test:

- A self-test of the sonar sensors (e.g. for connection) is only performed when a sonar sensor is “pulsed” (ultrasonic transmitting).
  NOTE:
  The self-test is performed irrespective The self-test is performed depending on the selector lever position of the automatic transmission and the speed.
- Sonar sensor test for subsequent vibrations:
  The test is performed cyclically.

Malfunction:

A malfunction can be caused by a temporary external disturbance (e.g. a jackhammer on a construction site, a steam jet or by driving through an automatic car wash). If the malfunction persists for a longer period of time, identification of the cause takes place during driving operation by means of a self-test. If the malfunction is still present, this is interpreted as a system error.

NOTE:
A warning sound is not emitted.

System Error:

A system error can have the following causes:

- Malfunctioning component
- Error in communication
- Over-voltage or under-voltage

If a system error or a malfunction in the sonar sensors is detected through a function test during operation, an error message is displayed on the display screen. The sonar control unit additionally sends a request to issue a warning tone to the display control unit via the CAN communication. The display control unit then actuates the warning buzzer directly. The display control unit issues a warning tone for t = 3 s, the sonar system switches itself off and a malfunction is entered in the DTC memory of the sonar control unit.

NOTE:

The size of the license plate bracket attached to the bumper varies depending on the national version. Due to the different dimensions and shapes the sonar system must be adapted to the particular circumstances. A diagnostic tester can be used to code the national version to prevent malfunction caused by the license plate bracket.

BEHAVIOR IN THE EVENT OF OVERVOLTAGE AND UNDERVOLTAGE FUNCTION SEQUENCE

The sonar system behavior in the event of over-voltage or under-voltage is described in the following table.

Battery power supply voltage U < 9.0 V	Battery power supply voltage U > 16.0 V	Under-voltage with reset	Under-voltage without reset (start pulse)
Sonar system nonfunctional	Sonar system nonfunctional	The function is activated again after a reset	Display distance
No function test, if voltage returns to normal	No function test, if voltage returns to normal	—	—
LED in the sonar system switch ON	LED in the sonar system switch ON	—	—

ACTIVATE AND DEACTIVATE FUNCTION SEQUENCE

Additional Function Requirements For Activation And Deactivation

- Self-test completed successfully
- Transmission not in gear range “D” or “R” engaged

NOTE:

If the parking brake is activated and gear range “N” is engaged, the sonar system is active for t = 2 s before it is automatically switched off. The electric parking brake control unit sends the status of the parking brake via the CAN communication to the sonar control unit.

Deactivate And Activate Function Sequence

The sonar system can be manually deactivated or activated by pressing the sonar system switch in the upper control panel. The upper control panel control unit reads in the status of the sonar system switch directly and sends it to the sonar control unit via the battery sensor LIN, BCM, electronic ignition switch control unit and CAN communication.

NOTE:

If the sonar system function has been switched off manually using the sonar system switch, it is automatically switched on again when ignition switch is activated again.

- When the sonar system is deactivated, only the LED in the sonar system switch lights up.
- In driving operation, the sonar system switches into “Standby mode” between v = 60 and 16 km/h (37 and 10 MPH), i.e. the sonar control unit and the sonar sensors are supplied with power.

FUNCTION SEQUENCE FOR MONITORING REVERSE TRAVEL

- Vehicle speed v = 0 to 18 km/h (0 to 11 MPH) or vehicle speed v = 16 to 0 km/h (10 to 0 MPH)
- Backward movement of vehicle

Function Sequence For Monitoring Reverse Travel

- During reverse travel the areas in front of and behind the vehicle are monitored. When the lower limit speed of v = 16 km/h (10 MPH) is dropped below, the sonar system changes to measuring mode. When obstacles are detected in front of or behind the vehicle, the driver is first warned visually by the displays a warning on sonar indicator in three stages (green, yellow, and red), according to a distance from an obstacle. The sonar control unit actuates the sonar system warning indicators directly.
- When a distance of s = 35 cm (13.8 in) is dropped below, the warning is then intensified by an intermittent tone and subsequently by a continuous signal emitted integrated in the sonar system warning indicators (see the obstacle detection distance). When the upper speed limit of v = 18 km/h (11MPH) is exceeded, the sonar system goes over into stand by mode again.

FUNCTION SEQUENCE FOR MONITORING FORWARD TRAVEL

- Vehicle speed v = 0 to 18 km/h (0 to 11 MPH) or vehicle speed v = 16 to 0 km/h (10 to 0 MPH)
- Forward movement of vehicle

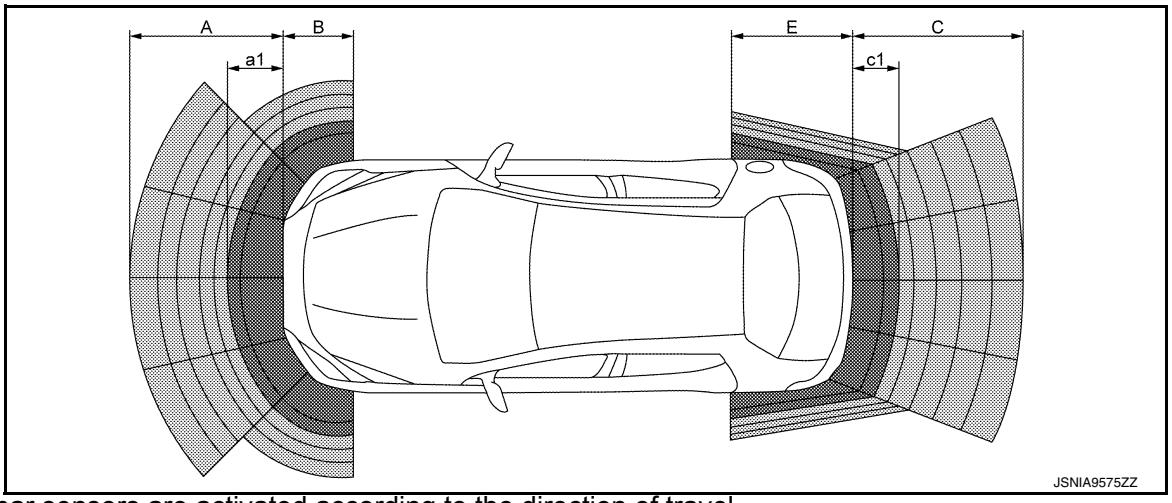
Function Sequence For Monitoring Forward Travel

When driving forwards the area in front of the vehicle is monitored.

When the lower limit speed of v = 16 km/h (10 MPH) is dropped below, the forward movement of vehicle sonar system changes to measuring mode. When obstacles are detected in front of the vehicle, the driver is first warned visually by the displays a warning on sonar indicator in three stages (green, yellow, and red), according to a distance from an obstacle.

When a distance of s = 35 cm (13.8 in) is dropped below, the warning is then intensified by an intermittent tone and subsequently by a continuous signal emitted integrated in the sonar system warning indicator (see the obstacle detection distance). When a speed of v = 18 km/h (11 MPH) is exceeded, the sonar system switches back to standby mode.

OBSTACLE DETECTION DISTANCE



The sonar sensors are activated according to the direction of travel.

During forward travel, the sonar sensors for the following monitoring ranges are activated:

- Front monitoring range (A).
- Corner safeguarding, front monitoring range (B)

During reverse travel, the sonar sensors for the following monitoring ranges are activated:

- Front monitoring range (A)
- Corner safeguarding, front monitoring range (B)
- Corner safeguarding, rear monitoring range (E)
- Rear monitoring range (C)

The monitoring ranges are defined as follows:

- Monitored range, front: s = 100 cm (39.3 in)
- Monitored range, rear: s = 120 cm (47.2 in)

If the distance of the vehicle to an obstacle is less than s = 20 cm (7.9 in) (a1, c1), the sonar system will not obtain any more defined data for technical reasons.

Front Sensor Detection Distance

Detection distance (default value)

Waning messages front monitoring range

Warning Level	Warning indicator	Warning buzzer	Distance (cm, in)	
			Corner sensor front RH, LR Center sensor front RH, LH	Side sensor front RH, LH
Level 1	Red	Continuous signal	0 - 35 cm (0 in - 13.78 in)	0 - 35 cm (0 in - 13.78 in)
Level 2	Yellow	10.0 Hz	35 - 44 cm (13.78 in - 17.32 in)	35 - 44 cm (13.78 in - 17.32 in)
	Yellow	8.0 Hz	45 - 54 cm (17.72 in - 21.26 in)	45 - 54 cm (17.72 in - 21.26 in)

Waning messages front monitoring range

Warning Level	Warning indicator	Warning buzzer	Distance (cm, in)	
			Corner sensor front RH, LR Center sensor front RH, LH	Side sensor front RH, LH
Level 3	Green	6.7 Hz	55 - 64 cm (21.65 in - 25.20 in)	55 - 64 cm (21.65 in - 25.20 in)
	Green	5.7 Hz	65 - 74 cm (25.59 in - 29.13 in)	—
Level 4	Green	—	75 - 84 cm (29.53 in - 33.07 in)	—
	Green	—	85 - 94 cm (33.46 in - 37.00 in)	—
	Green	—	95 - 104 cm (37.40 in - 40.94 in)	—
No detection	—	—	More than 105 cm (41.34 in)	More than 65 cm (25.59 in)

Detection distance (FAR)

Waning messages front monitoring range

Warning Level	Warning indicator	Warning buzzer	Distance (cm, in)	
			Corner sensor front RH, LR Center sensor front RH, LH	Side sensor front RH, LH
Level 1	Red	Continuous signal	0 - 35 cm (0 in - 13.78 in)	0 - 35 cm (0 in - 13.78 in)
Level 2	Yellow	10.0 Hz	35 - 44 cm (13.78 in - 17.32 in)	35 - 44 cm (13.78 in - 17.32 in)
	Yellow	8.0 Hz	45 - 54 cm (17.72 in - 21.26 in)	45 - 54 cm (17.72 in - 21.26 in)
Level 3	Green	6.7 Hz	55 - 64 cm (21.65 in - 25.20 in)	55 - 64 cm (21.65 in - 25.20 in)
	Green	5.7 Hz	65 - 74 cm (25.59 in - 29.13 in)	65 - 74 cm (25.59 in - 29.13 in)
Level 4	Green	—	75 - 84 cm (29.53 in - 33.07 in)	—
	Green	—	85 - 94 cm (33.46 in - 37.00 in)	—
	Green	—	95 - 104 cm (37.40 in - 40.94 in)	—
	Green	—	105 - 114 cm (41.33 in - 44.88 in)	—
No detection	—	—	More than 115 cm (45.28 in)	More than 75 cm (29.53 in)

Detection distance (NEAR)

Waning messages front monitoring range

Warning Level	Warning indicator	Warning buzzer	Distance (cm, in)	
			Corner sensor front RH, LR Center sensor front RH, LH	Side sensor front RH, LH
Level 1	Red	Continuous signal	0 - 35 cm (0 in - 13.78 in)	0 - 35 cm (0 in - 13.78 in)
Level 2	Yellow	10.0 Hz	35 - 44 cm (13.78 in - 17.32 in)	35 - 44 cm (13.78 in - 17.32 in)
	Yellow	8.0 Hz	45 - 54 cm (17.72 in - 21.26 in)	45 - 54 cm (17.72 in - 21.26 in)

Waning messages front monitoring range

Warning Level	Warning indicator	Warning buzzer	Distance (cm, in)	
			Corner sensor front RH, LR Center sensor front RH, LH	Side sensor front RH, LH
Level 3	Green	6.7 Hz	55 - 64 cm (21.65 in - 25.20 in)	55 - 64 cm (21.65 in - 25.20 in)
	Green	5.7 Hz	65 - 74 cm (25.59 in - 29.13 in)	—
Level 4	Green	—	75 - 84 cm (29.53 in - 33.07 in)	—
	Green	—	85 - 94 cm (33.46 in - 37.00 in)	—
No detection	—	—	More than 95 cm (37.40 in)	More than 65 cm (25.59 in)

Rear Sensor Detection Distance

Detection distance (default value)

Waning messages rear monitoring range

Warning Level	Warning indicator	Warning buzzer	Distance (cm, in)	
			Corner sensor rear RH, LR Center sensor rear RH, LH	Side sensor rear RH, LH
Level 1	Red	Continuous signal	0 - 35 cm (0 in - 13.78 in)	0 - 35 cm (0 in - 13.78 in)
Level 2	Yellow	10.0 Hz	35 - 44 cm (13.78 in - 17.32 in)	35 - 44 cm (13.78 in - 17.32 in)
	Yellow	8.0 Hz	45 - 54 cm (17.72 in - 21.26 in)	45 - 54 cm (17.72 in - 21.26 in)
Level 3	Green	6.7 Hz	55 - 64 cm (21.65 in - 25.20 in)	55 - 64 cm (21.65 in - 25.20 in)
	Green	5.7 Hz	65 - 74 cm (25.59 in - 29.13 in)	—
Level 4	Green	5.0 Hz	75 - 84 cm (29.53 in - 33.07 in)	—
	Green	4.4 Hz	85 - 94 cm (33.46 in - 37.00 in)	—
	Green	4.0 Hz	95 - 104 cm (37.40 in - 40.94 in)	—
	Green	3.6 Hz	105 - 114 cm (41.33 in - 44.88 in)	—
	Green	3.3 Hz	115 - 124 cm (45.28 in - 48.82 in)	—
	Green	3.1 Hz	125 - 134 cm (49.21 in - 52.76 in)	—
	Green	2.9 Hz	135 - 144 cm (53.15 in - 56.69 in)	—
	Green	2.7 Hz	145 - 154 cm (57.09 in - 60.63 in)	—
No detection	—	—	More than 155 cm (61.02 in)	More than 65 cm (25.59 in)

Detection distance (FAR)

Waning messages rear monitoring range

Warning Level	Warning indicator	Warning buzzer	Distance (cm, in)	
			Corner sensor rear RH, LR Center sensor rear RH, LH	Side sensor rear RH, LH
Level 1	Red	Continuous signal	0 - 35 cm (0 in - 13.78 in)	0 - 35 cm (0 in - 13.78 in)
Level 2	Yellow	10.0 Hz	35 - 44 cm (13.78 in - 17.32 in)	35 - 44 cm (13.78 in - 17.32 in)
	Yellow	8.0 Hz	45 - 54 cm (17.72 in - 21.26 in)	45 - 54 cm (17.72 in - 21.26 in)
Level 3	Green	6.7 Hz	55 - 64 cm (21.65 in - 25.20 in)	55 - 64 cm (21.65 in - 25.20 in)
	Green	5.7 Hz	65 - 74 cm (25.59 in - 29.13 in)	65 - 74 cm (25.59 in - 29.13 in)
Level 4	Green	5.0 Hz	75 - 84 cm (29.53 in - 33.07 in)	—
	Green	4.4 Hz	85 - 94 cm (33.46 in - 37.00 in)	—
	Green	4.0 Hz	95 - 104 cm (37.40 in - 40.94 in)	—
	Green	3.6 Hz	105 - 114 cm (41.33 in - 44.88 in)	—
	Green	3.3 Hz	115 - 124 cm (45.28 in - 48.82 in)	—
	Green	3.1 Hz	125 - 134 cm (49.21 in - 52.76 in)	—
	Green	2.9 Hz	135 - 144 cm (53.15 in - 56.69 in)	—
	Green	2.7 Hz	145 - 154 cm (57.09 in - 60.63 in)	—
	Green	2.7 Hz	155 - 164 cm (61.02 in - 64.56 in)	—
No detection	—	—	More than 165 cm (64.96 in)	More than 75 cm (29.53 in)

Detection distance (NEAR)

Waning messages rear monitoring range

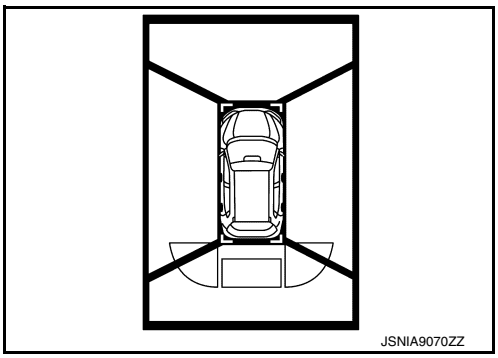
Warning Level	Warning indicator	Warning buzzer	Distance (cm, in)	
			Corner sensor rear RH, LR Center sensor rear RH, LH	Side sensor rear RH, LH
Level 1	Red	Continuous signal	0 - 35 cm (0 in - 13.78 in)	0 - 35 cm (0 in - 13.78 in)
Level 2	Yellow	10.0 Hz	35 - 44 cm (13.78 in - 17.32 in)	35 - 44 cm (13.78 in - 17.32 in)
	Yellow	8.0 Hz	45 - 54 cm (17.72 in - 21.26 in)	45 - 54 cm (17.72 in - 21.26 in)
Level 3	Green	6.7 Hz	55 - 64 cm (21.65 in - 25.20 in)	55 - 64 cm (21.65 in - 25.20 in)
	Green	5.7 Hz	65 - 74 cm (25.59 in - 29.13 in)	—

Waning messages rear monitoring range

Warning Level	Warning indicator	Warning buzzer	Distance (cm, in)	
			Corner sensor rear RH, LR Center sensor rear RH, LH	Side sensor rear RH, LH
Level 4	Green	5.0 Hz	75 - 84 cm (29.53 in - 33.07 in)	—
	Green	4.4 Hz	85 - 94 cm (33.46 in - 37.00 in)	—
	Green	4.0 Hz	95 - 104 cm (37.40 in - 40.94 in)	—
	Green	3.6 Hz	105 - 114 cm (41.33 in - 44.88 in)	—
	Green	3.3 Hz	115 - 124 cm (45.28 in - 48.82 in)	—
	Green	3.1 Hz	125 - 134 cm (49.21 in - 52.76 in)	—
	Green	2.9 Hz	135 - 144 cm (53.15 in - 56.69 in)	—
No detection	—	—	More than 145 cm (57.09 in)	More than 65 cm (25.59 in)

SONAR INDICATOR

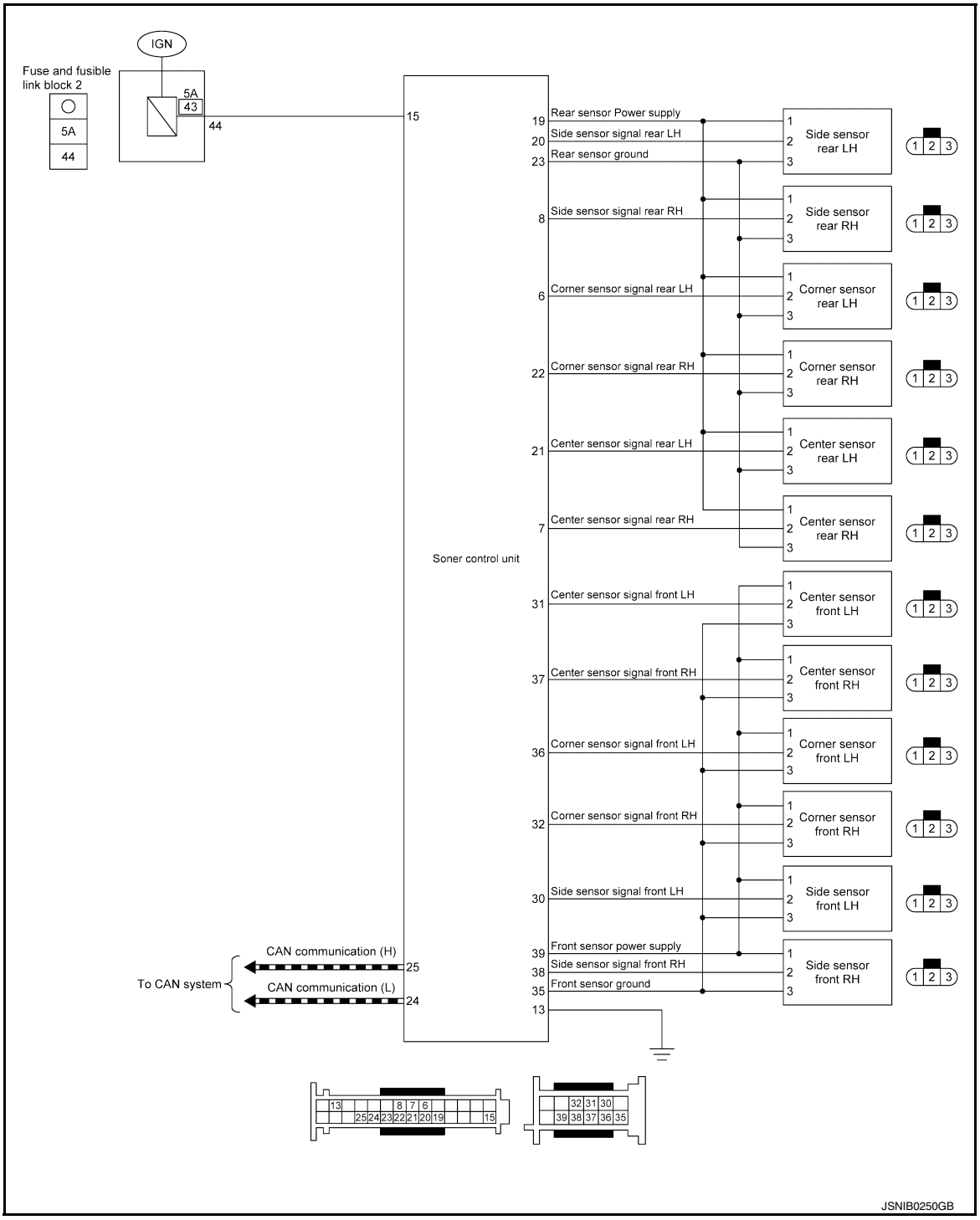
- Sonar indicator is displayed also on Bird-Eye view and front-side view screen of around view monitor.
- The sonar control unit displays a warning on sonar indicator in three stages (green, yellow, and red), according to a distance from an obstacle.



SONAR SYSTEM (FRONT 6 & REAR 6 SENSORS WITH PARK ASSIST) : Circuit Di-

agram

INFOID:0000000013611627



DIAGNOSIS SYSTEM (SONAR CONTROL UNIT)

CONSULT Function

INFOID:0000000013611628

APPLICATION ITEMS

CONSULT perform the following functions via communication with sonar control unit.

Test mode	Function
Self Diagnostic Results	Sonar control unit checks the conditions and displays memorized error.
Data Monitor	Sonar control unit input/output data in real time.
Work support	Sonar system function can be confirmed.
Ecu Identification	Sonar control unit part number can be read.
Configuration	Automatically writes the vehicle specification when replacing sonar control unit.

SELF-DIAGNOSTIC RESULTS

For details, refer to SN-39, "DTC Index".

Freeze Frame Data (FFD)

The following vehicle status is recorded when DTC is detected and is displayed on CONSULT.

Item name	Display content
Original Odometer Value	Total driving distance (odometer value) upon DTC detection is displayed.
Most Recent Odometer Value	—
Frequency Counter	—
Ignition Cycle Counter	Numerical value is displayed indicating the number of times that ignition switch is turned ON after the DTC is detected.

DATA MONITOR

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Monitor Item	Display/ UNIT	Description
OUTER F/L PARK SENSOR	cm	Displays the detection distance of the side sensor front LH.
CENTER F/L PARK SENSOR	cm	Displays the detection distance of the corner sensor front LH.
INNER F/L PARK SENSOR	cm	Displays the detection distance of the center sensor front LH.
INNER F/R PARK SENSOR	cm	Displays the detection distance of the center sensor front RH.
CENTER F/R PARK SENSOR	cm	Displays the detection distance of the corner sensor front RH.
OUTER F/R PARK SENSOR	cm	Displays the detection distance of the side sensor front RH.
OUTER R/R PARK SENSOR	cm	Displays the detection distance of the side sensor rear RH.
CENTER R/R PARK SENSOR	cm	Displays the detection distance of the corner sensor rear RH.
INNER R/R PARK SENSOR	cm	Displays the detection distance of the center sensor rear RH.
INNER R/L PARK SENSOR	cm	Displays the detection distance of the center sensor rear LH.
CENTER R/L PARK SENSOR	cm	Displays the detection distance of the corner sensor rear LH.
OUTER R/L PARK SENSOR	cm	Displays the detection distance of the side sensor rear LH.
BATTERY VOLTAGE CAN	V	Display the battery voltage.
Selector Lever Position	P/R/N/D/ SNA	Displays the status of shift position
BUTTON PARKING SYSTEM	NOT ACT/AC-TUAT	Displays the sonar system switch condition.

Monitor Item	Display/ UNIT	Description
PARKING BRAKE	NO END/ INCRSE/ DE-CRSE/ ACTUAT/ RE-LESE/ SNA	Displays the parking brake condition.
PARK BUTTON LED	Off/On	Displays the illuminate status of the sonar system switch LED.
BATT VOLT PARKING SYSTEM	V	Displays the battery voltage of sonar control unit.
PWR SUP WARN ELEMENTS	V	**NOTE:** This item is displayed, but it is not monitored.
ECM	PLAUBL/ IMPLBL	—
TRANSMISSION	PLAUBL/ IMPLBL	—
TRACTION SYSTEM	PLAUBL/ IMPLBL	—
ELECTRIC PARKING BRAKE	PLAUBL/ IMPLBL	—
POWER STEERING	PLAUBL/ IMPLBL	—
COMBINATION METER	PLAUBL/ IMPLBL	—
ELECTRONIC IGNITION LOCK	PLAUBL/ IMPLBL	—
STEERING COLUMN MODULE	PLAUBL/ IMPLBL	—
FRONT SIGNAL AND MODULE	PLAUBL/ IMPLBL	—
REAR SIGNAL AND MODULE	PLAUBL/ IMPLBL	—
CENTRAL GATEWAY	PLAUBL/ IMPLBL	—
SUPPLEMENTAL RESTRAINT	PLAUBL/ IMPLBL	—

WORK SUPPORT

Work support item	Function
ELECTRICAL CONTACTING OF SENSORS	Can check each sonar sensor.

ECU IDENTIFICATION

Displays the part number of the sonar control unit.

CONFIGURATION

For details, refer to SN-61, "Description".

ECU DIAGNOSIS INFORMATION

SONAR CONTROL UNIT

Reference Value

INFOID:0000000013611629

VALUES ON THE DIAGNOSIS TOOL

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

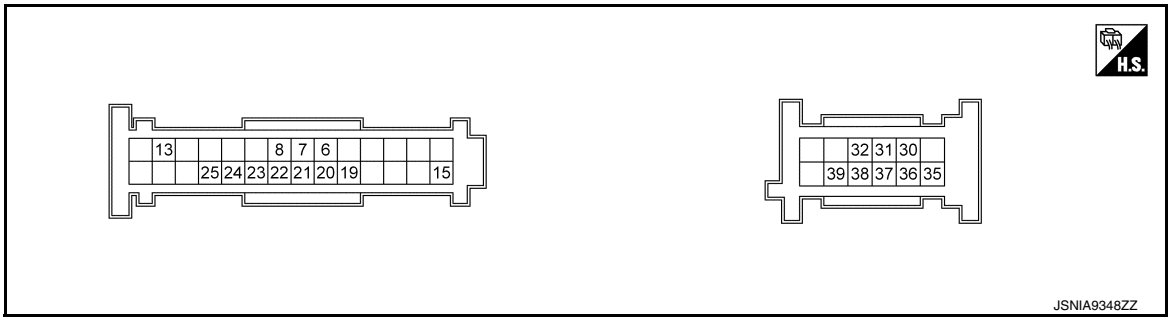
CONSULT MONITOR ITEM

Monitor Item	Condition		Value/Status
OUTER F/L PARK SENSOR	Ignition switch ON	An obstacle exists in the vicinity	Almost agree with the distance from the closest obstacle to front bumper.
		No obstacle exists in the vicinity	510 cm (200.79 in)
CENTER F/L PARK SENSOR	Ignition switch ON	An obstacle exists in the vicinity	Almost agree with the distance from the closest obstacle to front bumper.
		No obstacle exists in the vicinity	510 cm (200.79 in)
INNER F/L PARK SENSOR	Ignition switch ON	An obstacle exists in the vicinity	Almost agree with the distance from the closest obstacle to front bumper.
		No obstacle exists in the vicinity	510 cm (200.79 in)
INNER F/R PARK SENSOR	Ignition switch ON	An obstacle exists in the vicinity	Almost agree with the distance from the closest obstacle to front bumper.
		No obstacle exists in the vicinity	510 cm (200.79 in)
CENTER F/R PARK SENSOR	Ignition switch ON	An obstacle exists in the vicinity	Almost agree with the distance from the closest obstacle to front bumper.
		No obstacle exists in the vicinity	510 cm (200.79 in)
OUTER F/R PARK SENSOR	Ignition switch ON	An obstacle exists in the vicinity	Almost agree with the distance from the closest obstacle to front bumper.
		No obstacle exists in the vicinity	510 cm (200.79 in)
OUTER R/R PARK SENSOR	Ignition switch ON	An obstacle exists in the vicinity	Almost agree with the distance from the closest obstacle to rear bumper.
		No obstacle exists in the vicinity	510 cm (200.79 in)
CENTER R/R PARK SENSOR	Ignition switch ON	An obstacle exists in the vicinity	Almost agree with the distance from the closest obstacle to rear bumper.
		No obstacle exists in the vicinity	510 cm (200.79 in)
INNER R/R PARK SENSOR	Ignition switch ON	An obstacle exists in the vicinity	Almost agree with the distance from the closest obstacle to rear bumper.
		No obstacle exists in the vicinity	510 cm (200.79 in)
INNER R/L PARK SENSOR	Ignition switch ON	An obstacle exists in the vicinity	Almost agree with the distance from the closest obstacle to rear bumper.
		No obstacle exists in the vicinity	510 cm (200.79 in)

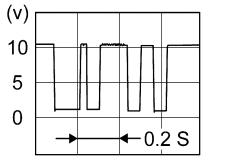
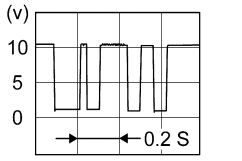
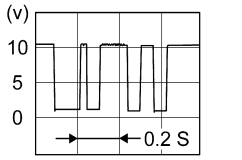
Monitor Item	Condition			Value/Status
CENTER R/L PARK SENSOR	Ignition switch ON	An obstacle exists in the vicinity		Almost agree with the distance from the closest obstacle to rear bumper.
		No obstacle exists in the vicinity		510 cm (200.79 in)
OUTER R/L PARK SENSOR	Ignition switch ON	An obstacle exists in the vicinity		Almost agree with the distance from the closest obstacle to rear bumper.
		No obstacle exists in the vicinity		510 cm (200.79 in)
BATTERY VOLTAGE CAN	Ignition switch ON	An obstacle exists in the vicinity		Approx. 12.0 V
Selector lever position	Ignition switch ON	7DCT models	Selector lever in P position	P
			Selector lever in R position	R
			Selector lever in N position	N
			Selector lever in D position	D
		M/T models	—	SNA
BUTTON PARKING SYSTEM	Ignition switch ON	Press sonar system switch		ACTUAT
		Other than the above		NOT ACT
		—		SNA
PARKING BRAKE	Ignition switch ON	—		NO END
		During the parking brake applied operation		INCRSE
		During the parking brake release operation		DECRSE
		Parking brake is applied		ACTUAT
		Parking brake is released		RELESE
		—		SNA
PARK BUTTON LED	Ignition switch ON	When LED is OFF		OFF
		When LED is ON		On
BATT VOLT PARKING SYSTEM	Ignition switch ON			Approx. 12.0 V
PWR SUP WARN ELEMENTS	**NOTE:** This item is displayed, but cannot be monitored.			
ECM	—			PLAUBL
				IMPLBL
TRANSMISSION	—			PLAUBL
				IMPLBL
TRACTION SYSTEM	—			PLAUBL
				IMPLBL
ELECTRIC PARKING BRAKE	—			PLAUBL
				IMPLBL
POWER STEERING	—			PLAUBL
				IMPLBL
COMBINATION METER	—			PLAUBL
				IMPLBL
ELECTRONIC IGNITION LOCK	—			PLAUBL
				IMPLBL
STEERING COLUMN MODULE	—			PLAUBL
				IMPLBL

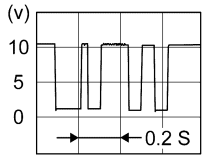
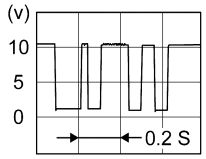
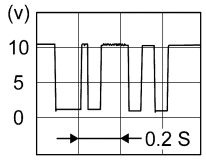
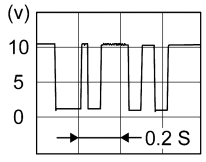
Monitor Item	Condition	Value/Status
FRONT SIGNAL AND MODULE	—	PLAUBL
		IMPLBL
REAR SIGNAL AND MODULE	—	PLAUBL
		IMPLBL
CENTRAL GATEWAY	—	PLAUBL
		IMPLBL
SUPPLEMENTAL RESTRAINT	—	PLAUBL
		IMPLBL

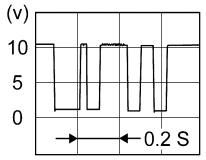
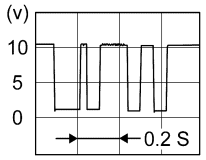
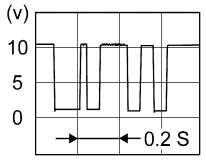
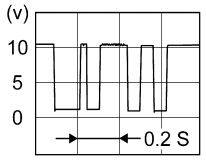
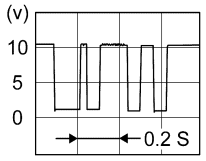
TERMINAL LAYOUT



PHYSICAL VALUES

Terminal (Wire color)		Description		Condition		Standard	Reference value (Approx.)
+	–	Signal name	Input/ Output				
6 (L)	23 (B)	Corner sensor signal rear LH	Input	Ignition switch ON	Shift position is in R position.	Waveform according to sensor signal is input	
7 (R)	23 (B)	Center sensor signal rear RH	Input	Ignition switch ON	Shift position is in R position.	Waveform according to sensor signal is input	
8 (Y)	23 (B)	Side sensor signal rear RH	Input	Ignition switch ON	Shift position is in R position.	Waveform according to sensor signal is input	
13 (BR)	Ground	Ground	—	Ignition switch ON	—	—	0 V

Terminal (Wire color)		Description		Condition		Standard	Reference value (Approx.)
+	–	Signal name	Input/ Output				
15 (R)	13 (BR)	Battery power supply	Input	Ignition switch ON	—	9.0 - 16.0 V	Battery voltage
19 (BR)	23 (B)	Rear sensor power supply	Output	Ignition switch ON	—	—	12.5 V
20 (V)	23 (B)	Side sensor signal rear LH	Input	Ignition switch ON	Shift position is in R position.	Waveform according to sensor signal is input	 JSNIA9349ZZ
21 (W)	23 (B)	Center sensor signal rear LH	Input	Ignition switch ON	Shift position is in R position.	Waveform according to sensor signal is input	 JSNIA9349ZZ
22 (Y)	23 (B)	Corner sensor signal rear RH	Input	Ignition switch ON	Shift position is in R position.	Waveform according to sensor signal is input	 JSNIA9349ZZ
23 (B)	Ground	Rear sensor ground	—	Ignition switch ON	—	—	0 V
24 (G)	—	CAN–L	Input/ Output	—	—	—	—
25 (W)	—	CAN–H	Input/ Output	—	—	—	—
30 (P)	35 (BR)	Side sensor signal front LH	Input	Ignition switch ON	Shift position is in R position.	Waveform according to sensor signal is input	 JSNIA9349ZZ

Terminal (Wire color)		Description		Condition		Standard	Reference value (Approx.)
+	–	Signal name	Input/ Output				
31 (Y)	35 (BR)	Center sensor signal front LH	Input	Ignition switch ON	Shift position is in R position.	Waveform according to sensor signal is input	 JSNIA9349ZZ
32 (O)	35 (BR)	Corner sensor signal front RH	Input	Ignition switch ON	Shift position is in R position.	Waveform according to sensor signal is input	 JSNIA9349ZZ
35 (BR)	Ground	Front sensor ground	—	Ignition switch ON	—	—	0 V
36 (R)	35 (BR)	Corner sensor signal front LH	Input	Ignition switch ON	Shift position is in R position.	Waveform according to sensor signal is input	 JSNIA9349ZZ
37 (V)	35 (BR)	Center sensor signal front RH	Input	Ignition switch ON	Shift position is in R position.	Waveform according to sensor signal is input	 JSNIA9349ZZ
38 (L)	35 (BR)	Side sensor signal front RH	Input	Ignition switch ON	Shift position is in R position.	Waveform according to sensor signal is input	 JSNIA9349ZZ
39 (GR)	35 (BR)	Front sensor power supply	Output	Ignition switch ON	—	—	12.5 V

Fail-Safe

INFOID:0000000013611630

DTC		Items (CONSULT screen terms)	Sub type (CONSULT screen terms)	Fail-safe condition
B122B	09	Outer RR distance sen has malf	[COMPONENT MALFUNCTION]	The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.
B122B	12		[CIRC SHORT TO BATTERY]	
B122B	14		[CIRC SHORT TO GROUND OR OPEN]	
B122B	23		[SIGNAL STUCK LOW]	
B122B	95		[INCORRECT ASSEMBLY]	
B1230	09	Center RR distance sen has malf	[COMPONENT MALFUNCTION]	
B1230	12		[CIRC SHORT TO BATTERY]	
B1230	14		[CIRC SHORT TO GROUND OR OPEN]	
B1230	23		[SIGNAL STUCK LOW]	
B1230	95		[INCORRECT ASSEMBLY]	
B1235	09	Inner RR distance sen has malf	[COMPONENT MALFUNCTION]	
B1235	12		[CIRC SHORT TO BATTERY]	
B1235	14		[CIRC SHORT TO GROUND OR OPEN]	
B1235	23		[SIGNAL STUCK LOW]	
B1235	95		[INCORRECT ASSEMBLY]	
B123A	09	Inner RL distance sen has malf	[COMPONENT MALFUNCTION]	
B123A	12		[CIRC SHORT TO BATTERY]	
B123A	14		[CIRC SHORT TO GROUND OR OPEN]	
B123A	23		[SIGNAL STUCK LOW]	
B123A	95		[INCORRECT ASSEMBLY]	
B1244	09	Outer FL distance sen has malf	[COMPONENT MALFUNCTION]	
B1244	12		[CIRC SHORT TO BATTERY]	
B1244	14		[CIRC SHORT TO GROUND OR OPEN]	
B1244	23		[SIGNAL STUCK LOW]	
B1244	95		[INCORRECT ASSEMBLY]	
B1249	09	Center FL distance sen has malf	[COMPONENT MALFUNCTION]	
B1249	12		[CIRC SHORT TO BATTERY]	
B1249	14		[CIRC SHORT TO GROUND OR OPEN]	
B1249	23		[SIGNAL STUCK LOW]	
B1249	95		[INCORRECT ASSEMBLY]	
B124E	09	Inner FL distance sen has malf	[COMPONENT MALFUNCTION]	
B124E	12		[CIRC SHORT TO BATTERY]	
B124E	14		[CIRC SHORT TO GROUND OR OPEN]	
B124E	23		[SIGNAL STUCK LOW]	
B124E	95		[INCORRECT ASSEMBLY]	
B1253	09	Inner FR distance sen has malf	[COMPONENT MALFUNCTION]	
B1253	12		[CIRC SHORT TO BATTERY]	
B1253	14		[CIRC SHORT TO GROUND OR OPEN]	
B1253	23		[SIGNAL STUCK LOW]	
B1253	95		[INCORRECT ASSEMBLY]	

DTC		Items (CONSULT screen terms)	Sub type (CONSULT screen terms)	Fail-safe condition
B1258	09	Center FR distance sen has malf	[COMPONENT MALFUNCTION]	The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.
B1258	12		[CIRC SHORT TO BATTERY]	
B1258	14		[CIRC SHORT TO GROUND OR OPEN]	
B1258	23		[SIGNAL STUCK LOW]	
B1258	95		[INCORRECT ASSEMBLY]	
B125D	09	Outer FR distance sen has malf	[COMPONENT MALFUNCTION]	
B125D	12		[CIRC SHORT TO BATTERY]	
B125D	14		[CIRC SHORT TO GROUND OR OPEN]	
B125D	23		[SIGNAL STUCK LOW]	
B125D	95		[INCORRECT ASSEMBLY]	
B127B	09	Center RL distance sen has malf	[COMPONENT MALFUNCTION]	
B127B	12		[CIRC SHORT TO BATTERY]	
B127B	14		[CIRC SHORT TO GROUND OR OPEN]	
B127B	23		[SIGNAL STUCK LOW]	
B127B	95		[INCORRECT ASSEMBLY]	
B1280	09	Outer RL distance sen has malf	[COMPONENT MALFUNCTION]	
B1280	12		[CIRC SHORT TO BATTERY]	
B1280	14		[CIRC SHORT TO GROUND OR OPEN]	
B1280	23		[SIGNAL STUCK LOW]	
B1280	95		[INCORRECT ASSEMBLY]	
B1285	1C	Fr distance sens have malf	[CIRC VOLTAGE OUT OF RANGE]	
B1286	1C	Rr distance sens have malf	[CIRC VOLTAGE OUT OF RANGE]	
B210A	00	Power Supply circuit	[NO SUBTYPE INFORMATION]	Sonar system and park assist do not operate.
B210B	00	Power Supply circuit	[NO SUBTYPE INFORMATION]	
B210C	16	Power supply is outside valid range	[CIRC VOLT BELOW THRESHOLD]	The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.
B210C	17	Power supply is outside valid range	[CIRC VOLT ABOVE THRESHOLD]	
B2232	47	Control unit parking system has malf	[WATCHDOG/SAFETY UC FAILURE]	
B2232	55		[NOT CONFIURED]	
B2232	96		[CMPNENT INTERNAL MLFNCTN]	
U0037	88	Vehicle communication bus B	[BUS OFF]	
U0100	87	Communication error	[MISSING MESSAGE]	Sonar system and park assist do not operate.
U0101	87	COMMUNICATION ERROR (LOST)	[MISSING MESSAGE]	The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.
U0122	87	Lost Communication With VDCM	[MISSING MESSAGE]	Sonar system and park assist do not operate.
U0128	87	COMMUNICATION ERROR (LOST)	[MISSING MESSAGE]	Sonar system and park assist do not operate.

DTC		Items (CONSULT screen terms)	Sub type (CONSULT screen terms)	Fail-safe condition
U0131	87	No CAN message EPS C/U	[MISSING MESSAGE]	Sonar system and park assist do not operate.
U0155	87	COMMUNICATION ERROR (LOST)	[MISSING MESSAGE]	
U0168	87	COMMUNICATION ERROR (LOST)	[MISSING MESSAGE]	
U0212	87	COMMUNICATION ERROR (LOST)	[MISSING MESSAGE]	Sonar system and park assist do not operate.

DTC Index

INFOID:0000000013611631

DTC		Items (CONSULT screen terms)	Sub type (CONSULT screen terms)	Reference
B122B	09	Outer RR distance sen has malf	[COMPONENT MALFUNCTION]	SN-62, "DTC Description"
B122B	12		[CIRC SHORT TO BATTERY]	
B122B	14		[CIRC SHORT TO GROUND OR OPEN]	
B122B	23		[SIGNAL STUCK LOW]	
B122B	95		[INCORRECT ASSEMBLY]	
B1230	09	Center RR distance sen has malf	[COMPONENT MALFUNCTION]	SN-70, "DTC Description"
B1230	12		[CIRC SHORT TO BATTERY]	
B1230	14		[CIRC SHORT TO GROUND OR OPEN]	
B1230	23		[SIGNAL STUCK LOW]	
B1230	95		[INCORRECT ASSEMBLY]	
B1235	09	Inner RR distance sen has malf	[COMPONENT MALFUNCTION]	SN-79, "DTC Description"
B1235	12		[CIRC SHORT TO BATTERY]	
B1235	14		[CIRC SHORT TO GROUND OR OPEN]	
B1235	23		[SIGNAL STUCK LOW]	
B1235	95		[INCORRECT ASSEMBLY]	
B123A	09	Inner RL distance sen has malf	[COMPONENT MALFUNCTION]	SN-88, "DTC Description"
B123A	12		[CIRC SHORT TO BATTERY]	
B123A	14		[CIRC SHORT TO GROUND OR OPEN]	
B123A	23		[SIGNAL STUCK LOW]	
B123A	95		[INCORRECT ASSEMBLY]	
B1244	09	Outer FL distance sen has malf	[COMPONENT MALFUNCTION]	SN-97, "DTC Description"
B1244	12		[CIRC SHORT TO BATTERY]	
B1244	14		[CIRC SHORT TO GROUND OR OPEN]	
B1244	23		[SIGNAL STUCK LOW]	
B1244	95		[INCORRECT ASSEMBLY]	
B1249	09	Center FL distance sen has malf	[COMPONENT MALFUNCTION]	SN-105, "DTC Description"
B1249	12		[CIRC SHORT TO BATTERY]	
B1249	14		[CIRC SHORT TO GROUND OR OPEN]	
B1249	23		[SIGNAL STUCK LOW]	
B1249	95		[INCORRECT ASSEMBLY]	

DTC		Items (CONSULT screen terms)	Sub type (CONSULT screen terms)	Reference
B124E	09	Inner FL distance sen has malf	[COMPONENT MALFUNCTION]	SN-114, "DTC Description"
B124E	12		[CIRC SHORT TO BATTERY]	
B124E	14		[CIRC SHORT TO GROUND OR OPEN]	
B124E	23		[SIGNAL STUCK LOW]	
B124E	95		[INCORRECT ASSEMBLY]	
B1253	09	Inner FR distance sen has malf	[COMPONENT MALFUNCTION]	SN-123, "DTC Description"
B1253	12		[CIRC SHORT TO BATTERY]	
B1253	14		[CIRC SHORT TO GROUND OR OPEN]	
B1253	23		[SIGNAL STUCK LOW]	
B1253	95		[INCORRECT ASSEMBLY]	
B1258	09	Center FR distance sen has malf	[COMPONENT MALFUNCTION]	SN-132, "DTC Description"
B1258	12		[CIRC SHORT TO BATTERY]	
B1258	14		[CIRC SHORT TO GROUND OR OPEN]	
B1258	23		[SIGNAL STUCK LOW]	
B1258	95		[INCORRECT ASSEMBLY]	
B125D	09	Outer FR distance sen has malf	[COMPONENT MALFUNCTION]	SN-141, "DTC Description"
B125D	12		[CIRC SHORT TO BATTERY]	
B125D	14		[CIRC SHORT TO GROUND OR OPEN]	
B125D	23		[SIGNAL STUCK LOW]	
B125D	95		[INCORRECT ASSEMBLY]	
B127B	09	Center RL distance sen has malf	[COMPONENT MALFUNCTION]	SN-149, "DTC Description"
B127B	12		[CIRC SHORT TO BATTERY]	
B127B	14		[CIRC SHORT TO GROUND OR OPEN]	
B127B	23		[SIGNAL STUCK LOW]	
B127B	95		[INCORRECT ASSEMBLY]	
B1280	09	Outer RL distance sen has malf	[COMPONENT MALFUNCTION]	SN-158, "DTC Description"
B1280	12		[CIRC SHORT TO BATTERY]	
B1280	14		[CIRC SHORT TO GROUND OR OPEN]	
B1280	23		[SIGNAL STUCK LOW]	
B1280	95		[INCORRECT ASSEMBLY]	
B1285	1C	Fr distance sens have malf	[CIRC VOLTAGE OUT OF RANGE]	SN-166, "DTC Description"
B1286	1C	Rr distance sens have malf	[CIRC VOLTAGE OUT OF RANGE]	SN-169, "DTC Description"
B210A	00	Power Supply circuit	[NO SUBTYPE INFORMATION]	SN-172, "DTC Description"
B210B	00	Power Supply circuit	[NO SUBTYPE INFORMATION]	SN-174, "DTC Description"
B210C	16	Power supply is outside valid range	[CIRC VOLT BELOW THRESHOLD]	SN-176, "DTC Description"
B210C	17	Power supply is outside valid range	[CIRC VOLT ABOVE THRESHOLD]	
B2232	47	Control unit parking system has malf	[WATCHDOG/SAFETY UC FAILURE]	SN-179, "DTC Description"
B2232	55		[NOT CONFIURED]	
B2232	96		[CMPNENT INTERNAL MLFNCTN]	
U0037	88	Vehicle communication bus B	[BUS OFF]	SN-182, "DTC Description"
U0100	87	Communication error	[MISSING MESSAGE]	SN-184, "DTC Description"
U0101	87	COMMUNICATION ERROR (LOST)	[MISSING MESSAGE]	SN-186, "DTC Description"
U0122	87	Lost Communication With VDCM	[MISSING MESSAGE]	SN-188, "DTC Description"
U0128	87	COMMUNICATION ERROR (LOST)	[MISSING MESSAGE]	SN-190, "DTC Description"

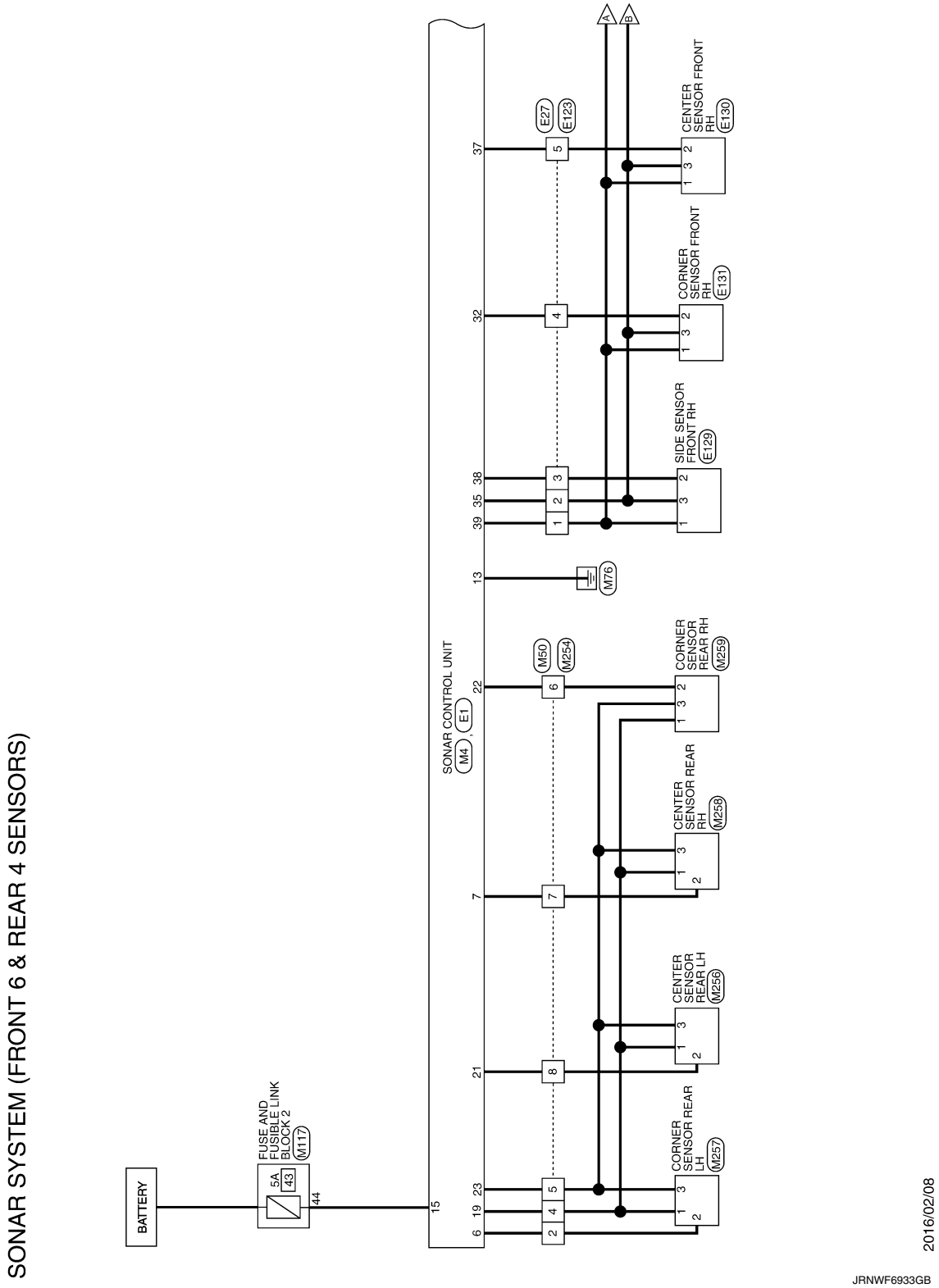
DTC		Items (CONSULT screen terms)	Sub type (CONSULT screen terms)	Reference
U0131	87	No CAN message EPS C/U	[MISSING MESSAGE]	SN-192, "DTC Description"
U0155	87	COMMUNICATION ERROR (LOST)	[MISSING MESSAGE]	SN-194, "DTC Description"
U0168	87	COMMUNICATION ERROR (LOST)	[MISSING MESSAGE]	SN-196, "DTC Description"
U0212	87	COMMUNICATION ERROR (LOST)	[MISSING MESSAGE]	SN-198, "DTC Description"

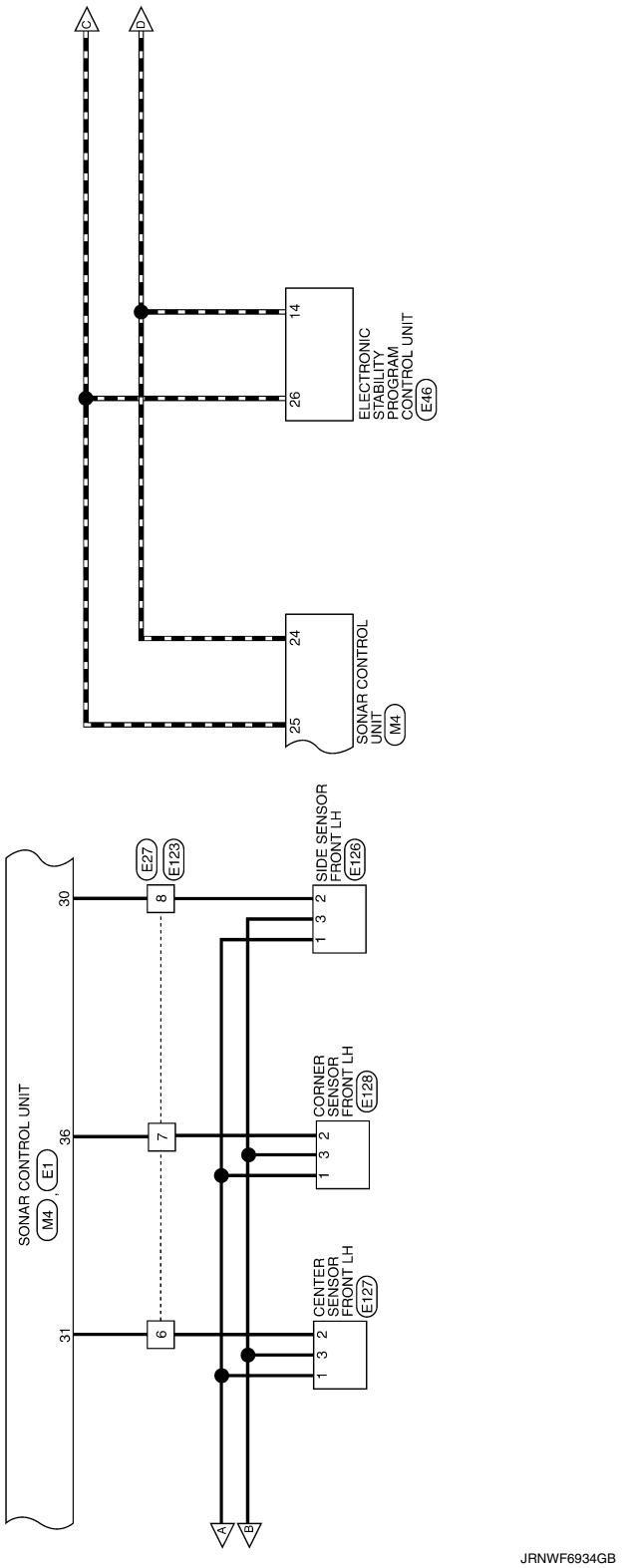
WIRING DIAGRAM

SONAR SYSTEM (FRONT 6 & REAR 4 SENSORS)

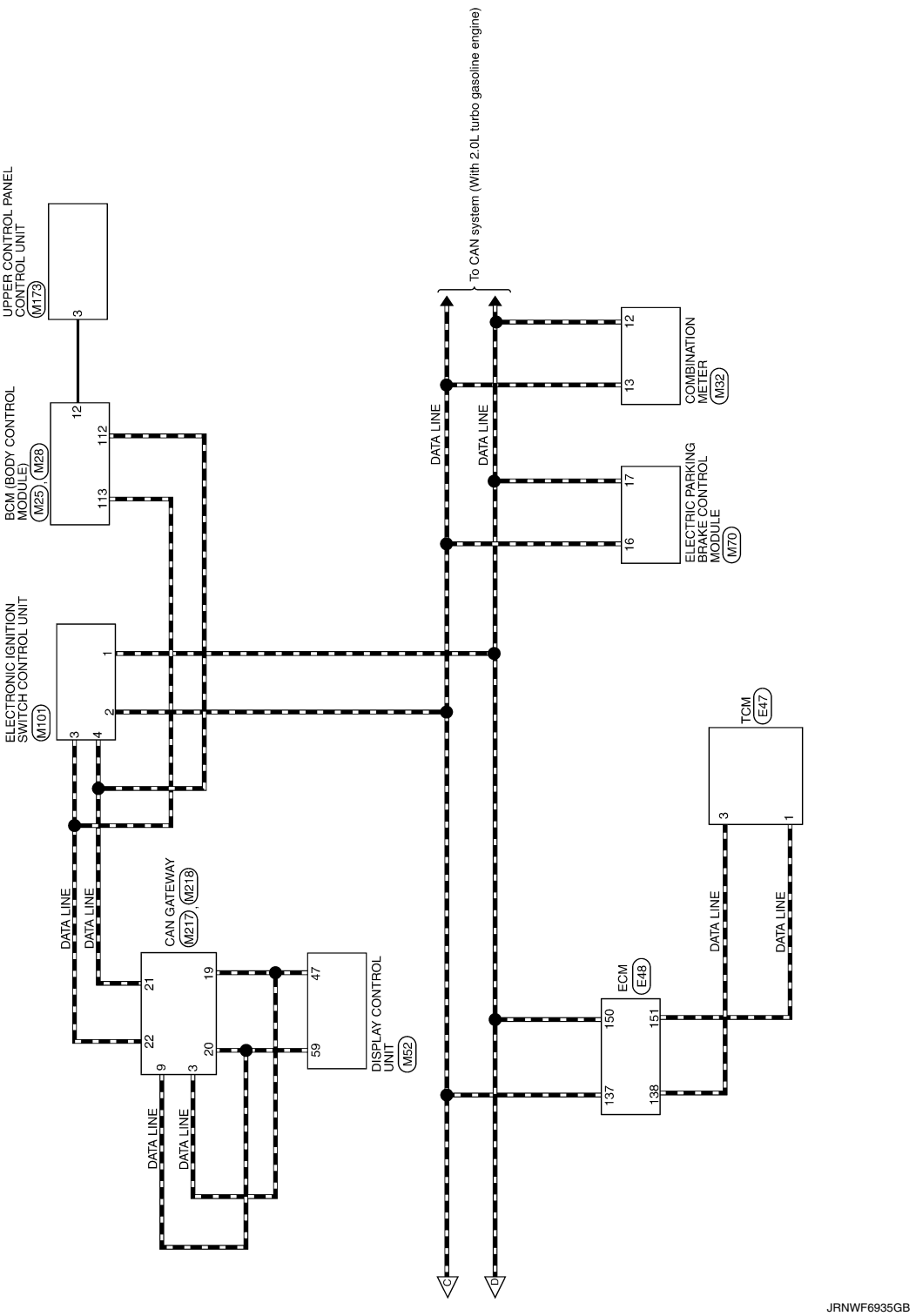
Wiring Diagram

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JRNWF6934GB


To CAN system (With 2.0L turbo gasoline engine)
UPPER CONTROL PANEL CONTROL UNIT (M173)
BCM (BODY CONTROL MODULE) (M25), (M28)
ELECTRONIC IGNITION SWITCH CONTROL UNIT (M101)
CAN GATEWAY (M217), (M218)
DISPLAY CONTROL UNIT (M52)
COMBINATION METER (M32)
ELECTRIC PARKING BRAKE CONTROL MODULE (M70)
TCM (E47)
ECM (E48)
DATA LINE
JRNWF6935GB

SONAR SYSTEM (FRONT 6 & REAR 4 SENSORS)

Connector No.	E1
Connector Name	SONAR CONTROL UNIT
Connector Type	MB_A0525451626

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
30	P	SIDE SENSAR SIGNAL FRONT LH
31	Y	CENTER SENSAR SIGNAL FRONT LH
32	O	CORNER SENSAR SIGNAL FRONT RH
35	BR	FRONT SENSOR GROUND
36	R	CORNER SENSAR SIGNAL FRONT LH
37	V	CENTER SENSAR SIGNAL FRONT RH
38	L	SIDE SENSAR SIGNAL FRONT RH
39	GR	FRONT SENSOR POWER SUPPLY

Connector No.	E46
Connector Name	ELECTRONIC STABILITY PROGRAM CONTROL UNIT
Connector Type	MB_A2465400581

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	R	MOTOR POWER SUPPLY
2	W	BRAKE PEDAL
4	P	RIGHT FRONT AXLE RPM SENSOR SIGNAL
5	GR	BRAKE VACUUM SENSOR POWER SUPPLY
6	B	BRAKE LIGHT SWITCH-L
7	R	BATTERY POWER SUPPLY
8	Y	LFET FRONT AXLE RPM SENSOR SIGNAL
10	O	STANDSTILL CONTROL (SSC) STATUS
12	P	BRAKE VACUUM SENSOR SIGNAL
13	BR	GROUND (MOTOR)
14	G	CAN-L
16	B	RIGHT FRONT AXLE RPM SENSOR POWER SUPPLY
17	Y	RIGHT REAR AXLE RPM SENSOR POWER SUPPLY
18	BR	LFET REAR AXLE RPM SENSOR SIGNAL
19	W	LFET FRONT AXLE RPM SENSOR POWER SUPPLY
23	B	BRAKE VACUUM SENSOR GROUND
25	P	VALVE RELAY POWER SUPPLY
26	W	CAN-H
28	R	BATTERY POWER SUPPLY
29	P	RIGHT REAR AXLE RPM SENSOR SIGNAL
30	V	BRAKE LIGHT SWITCH-H
31	GR	LFET REAR AXLE RPM SENSOR POWER SUPPLY
32	L	BRAKE LIGHT SWITCH GROUND
35	R	BRAKE LIGHT SWITCH POWER SUPPLY
38	B	GROUND (VALVE)

Connector No.	E27
Connector Name	WIRE TO WIRE
Connector Type	RH12MB

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	GR	-
2	BR	-
3	L	-
4	O	-
5	V	-
6	Y	-
7	R	-
8	P	-

Connector No.	E47
Connector Name	TCM
Connector Type	MB_A2465450026

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	CAN-L
2	V	NOT P
3	GR	CAN-H
5	W	BATTERY POWER SUPPLY

Connector No.	E48
Connector Name	ECM
Connector Type	MB_A0075406981

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
97	R	POWER SUPPLY (ECM)
98	BR	ECM GROUND
99	V	POWER SUPPLY (ECM)
100	BR	ECM GROUND
101	R	POWER SUPPLY (ECM)
102	B	ECM GROUND
103	L	COOLING FAN CONTROL SIGNAL
104	R	SENSOR POWER SUPPLY (ACCELERATOR PEDAL POSITION SENSOR 3)
105	G	SENSOR POWER SUPPLY (ACCELERATOR PEDAL POSITION SENSOR 2)
106	BR	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR)
111	B	IGNITION SIGNAL
112	Y	POWER SUPPLY (BATTERY)
116	W	STARTER RELAY-L
119	GR	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 2)
120	O	SENSOR GROUND

122	R	HOT START SIGNAL
123	GR	MOTOR RELAY CONTROL SIGNAL
127	O	FUEL PUMP ON SIGNAL
132	G	ACCELERATOR PEDAL POSITION SENSOR 1
136	Y	POWERTRAIN SENSOR CAN-H
137	W	CAN-H
138	GR	POWERTRAIN CAN-H
141	B	WATER PUMP RELAY CONTROL SIGNAL
145	W	ACCELERATOR PEDAL POSITION SENSOR 2
146	G	FUEL TANK PRESSURE SENSOR
147	L	CRASH SIGNAL
148	W	STARTER RELAY-H
149	B	POWERTRAIN SENSOR CAN-L
150	G	CAN-L
151	L	POWERTRAIN CAN-L
152	V	EVAP CANISTER VENT CONTROL VALVE
153	BR	EVAP PURGE CONTROL VALVE

Connector No.	E123
Connector Name	WIRE TO WIRE
Connector Type	RH12FB

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	BR	-
3	Y	-
4	R	-
5	V	-
6	W	-
7	R	-
8	P	-

JRNWF6936GB

SONAR SYSTEM (FRONT 6 & REAR 4 SENSORS)

Connector No.	E126
Connector Name	SIDE SENSOR FRONT LH
Connector Type	MB_A2115452728

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	P	-
3	BR	-

Connector No.	E127
Connector Name	CENTER SENSOR FRONT LH
Connector Type	MB_A2115451728

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	W	-
3	BR	-

Connector No.	E128
Connector Name	CORNER SENSOR FRONT LH
Connector Type	MB_A2115451728

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	R	-
3	BR	-

Connector No.	E129
Connector Name	SIDE SENSOR FRONT RH
Connector Type	MB_A2115452728

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	Y	-
3	BR	-

Connector No.	E130
Connector Name	CENTER SENSOR FRONT RH
Connector Type	MB_A2115451728

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	V	-
3	BR	-

Connector No.	E131
Connector Name	CORNER SENSOR FRONT RH
Connector Type	MB_A2115451728

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	R	-
3	BR	-

Connector No.	M4
Connector Name	SONAR CONTROL UNIT
Connector Type	MB_A0015403081

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
6	L	CORNER SENSAR SIGNAL REAR LH
7	R	CENTER SENSAR SIGNAL REAR RH
8	Y	SIDE SENSAR SIGNAL REAR RH
13	BR	GROUND
15	R	BATTERY POWER SUPPLY
19	BR	REAR SENSOR POWER SUPPLY
20	V	SIDE SENSAR SIGNAL REAR LH
21	W	CENTER SENSAR SIGNAL REAR LH
22	Y	CORNER SENSAR SIGNAL REAR RH
23	B	REAR SENSOR GROUND
24	G	CAN-L
25	W	CAN-H

Connector No.	M25
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	MB_A0075405081

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	ROTARY LIGHT SW GND
2	O	ROTARY LIGHT SW (PU/PR/TAIL)
3	R	ROTARY LIGHT SW (AUTO/LOW)
4	G	ROTARY LIGHT SW (FR FOG)
5	Y	-
7	GR	SWITCH INDICATOR
8	R	CAN-H (BODY 2)
9	BR	CAN-L (BODY 2)

JRNWF6937GB

SONAR SYSTEM (FRONT 6 & REAR 4 SENSORS)

12	O	LIN (IBS)
14	G	FOOT LAMP

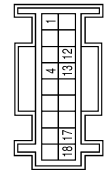
Connector No. M28
Connector Name BCM (BODY CONTROL MODULE)
Connector Type MB_A1665400481

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
67	V	BACK DOOR UNLOCK
69	GR	STOP LAMP (BODY RH)
70	B	REAR TURN SIGNAL LH
71	GR	BACK-UP LAMP RH
72	Y	LICENSE PLATE LAMP RH
73	L	RR POWER WINDOW SW RH UP
74	B	RR POWER WINDOW SW RH DOWN
75	L	RR POWER WINDOW SW RH GND
76	GR	HALL SENSOR RH POWER SUPPLY
77	R	SUB BAT-
78	B	TERMINAL RELAY 15R1 CONT
80	B	REAR WIPER RELAY CONT
82	GR	TAIL LAMP (BODY LH)
83	P	TERMINAL RELAY 15R2 CONT
85	B	TAIL LAMP (BK LH)
87	R	BAT (VIA LATCHING TERMINAL RELAY 30G)
89	O	HALL SENSOR RH GND
90	V	HALL SENSOR RH SIGNAL
91	P	FUEL LEVEL SENSOR GND
92	L	FUEL LEVEL SENSOR
93	GR	FUEL LEVEL SENSOR
94	Y	FUEL FILLER LID STATUS
97	G	LATCHING TERMINAL RELAY 30G CONT 1
98	B	LATCHING TERMINAL RELAY 30G GND 1
99	W	LATCHING TERMINAL RELAY 30G GND 2
100	V	LATCHING TERMINAL RELAY 30G CONT 2
101	Y	REAR DOOR INSIDE HANDLE LAMP CONT
102	GR	AMBIENT LAMP CONT
103	V	SUB BAT RELAY CONT
105	G	RR DOOR LH UNLOCK
106	W	FUEL FILLER LID UNLOCK
107	L	RR DOOR LH LOCK
108	R	SUB BAT+
109	O	LIN (ROOF)
112	BR	CAN-L (BODY 1)
113	R	CAN-H (BODY 1)
114	B	INJECTION RELAY CONT

Connector No. M32
Connector Name COMBINATION METER
Connector Type MB_A0525452726

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	BR	GROUND
4	R	BATTERY POWER SUPPLY
12	GR	CAN-L
13	W	CAN-H
17	BR	CAN-L
18	R	CAN-H

Connector No. M50
Connector Name WIRE TO WIRE
Connector Type MB_A0565451928

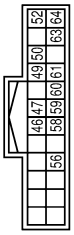
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	V	-
2	L	-
3	Y	-
4	BR	-
5	B	-
6	Y	-
7	R	-
8	W	-

Connector No. M52
Connector Name DISPLAY CONTROL UNIT
Connector Type TH24FW-NH

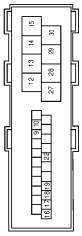
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
46	G	AV COMMUNICATION SIGNAL (L)
47	P	CAN-L
49	R	DIMMER SIGNAL
50	BR	REVERSE SIGNAL
52	B	GROUND
56	BR	CAMERA SWITCH SIGNAL
58	Y	AV COMMUNICATION SIGNAL (H)
59	L	CAN-H
60	W	IGNITION SIGNAL
61	R	VEHICLE SPEED SIGNAL (8-PULSE)
63	L	ACC POWER SUPPLY
64	Y	BATTERY POWER SUPPLY

Connector No. M70
Connector Name ELECTRIC PARKING BRAKE CONTROL MODULE
Connector Type MB_A0085409281

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
9	G	ELECTRIC PARKING BRAKE SWITCH 1
10	P	ELECTRIC PARKING BRAKE SWITCH 2
12	R	MOTOR RH (+)
13	W	MOTOR POWER SUPPLY (RH)
14	R	MOTOR LH (+)
15	R	MOTOR POWER SUPPLY (LH)
16	W	CAN-H
17	G	CAN-L
18	O	ELECTRIC PARKING BRAKE SWITCH 3
19	G	ELECTRIC PARKING BRAKE SWITCH 4
22	B	POWER SUPPLY
27	Y	MOTOR RH (-)
28	BR	GROUND (MOTOR RH)
29	V	MOTOR LH (-)
30	BR	GROUND (MOTOR LH)

Connector No. M101
Connector Name ELECTRONIC IGNITION SWITCH CONTROL UNIT
Connector Type MB_A0265458426

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	G	CHASSIS CAN-L
2	W	CHASSIS CAN-H
3	R	BODY CAN 1-H
4	BR	BODY CAN 1-L
6	W	STEERING LOCK OPERATION
9	GR	REMOTE KEYLESS
10	W	POWER SUPPLY
11	BR	DIAGNOSTIC CAN-L
12	L	DIAGNOSTIC CAN-H

JRNWF6938GB

SONAR SYSTEM (FRONT 6 & REAR 4 SENSORS)

Connector No.	M117
Connector Name	FUSE AND FUSIBLE LINK BLOCK 2
Connector Type	MB_A0065451101

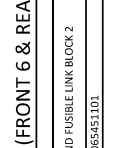
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
44	R	-

Connector No.	M173
Connector Name	UPPER CONTROL PANEL CONTROL UNIT
Connector Type	MB_A0385451228

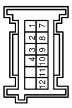
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	GR	PWR SPLY
2	BR	GND
3	O	LIN

Connector No.	M217
Connector Name	CAN GATEWAY
Connector Type	MB_A0225400481

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	SOS SWITCH LED SIGNAL
2	R	DIMMER SIGNAL
3	P	MULTIFUNCTION MEDIA CAN-L
4	O	ENGINE SPEED SIGNAL
7	BR	REVERSE SIGNAL
8	V	ACC POWER SUPPLY
9	L	MULTIFUNCTION MEDIA CAN-H
10	W	SOS CALL SWITCH SIGNAL
11	Y	VEHICLE SPEED SIGNAL
12	W	ILLUMINATION CONTROL SIGNAL

Connector No.	M218
Connector Name	CAN GATEWAY
Connector Type	MB_A0225400581

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
13	B	GROUND
14	G	AV COMMUNICATION-L
15	L	AV COMMUNICATION-H
16	G	CHASSIS CAN-L
17	W	CHASSIS CAN-H
18	O	BATTERY POWER SUPPLY
19	P	MULTIFUNCTION MEDIA CAN-L
20	L	MULTIFUNCTION MEDIA CAN-H
21	BR	BODY CAN 1-L
22	R	BODY CAN 1-H

23	DIAGNOSTIC CAN-L
24	DIAGNOSTIC CAN-H

Connector No.	M254
Connector Name	WIRE TO WIRE
Connector Type	MB_A0485454028

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	V	-
2	L	-
3	Y	-
4	B	-
5	BR	-
6	G	-
7	R	-
8	W	-

Connector No.	M256
Connector Name	CENTER SENSOR REAR LH
Connector Type	MB_A2115451728

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	W	-
3	BR	-

Connector No.	M257
Connector Name	CORNER SENSOR REAR LH
Connector Type	MB_A2115451728

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	L	-
3	BR	-

Connector No.	M258
Connector Name	CENTER SENSOR REAR RH
Connector Type	MB_A2115451728

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	R	-
3	BR	-

JRNWF6939GB

SONAR SYSTEM (FRONT 6 & REAR 4 SENSORS)

Connector No.	M259
Connector Name	CORNER SENSOR REAR RH
Connector Type	MB_A2115451728





Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	G	-
3	BR	-

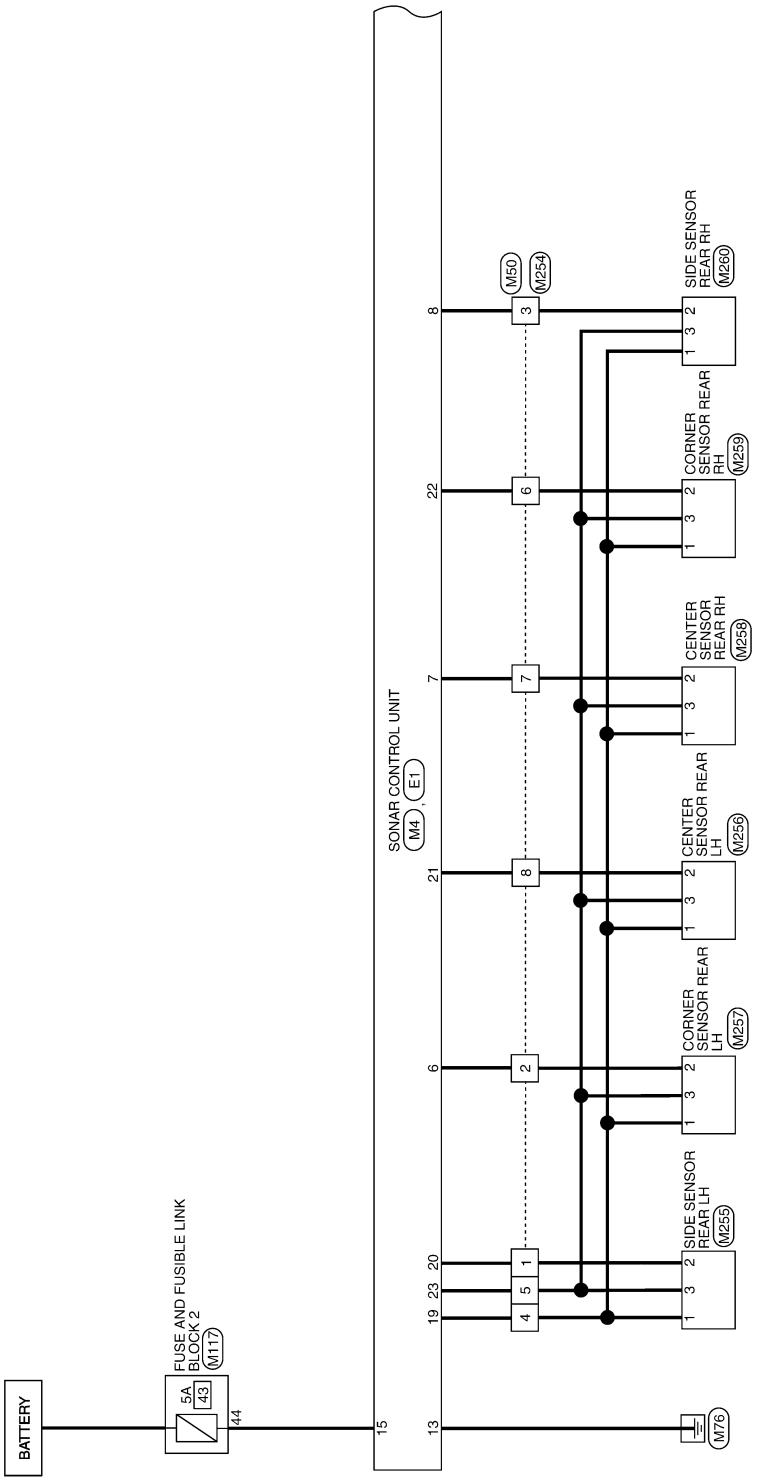
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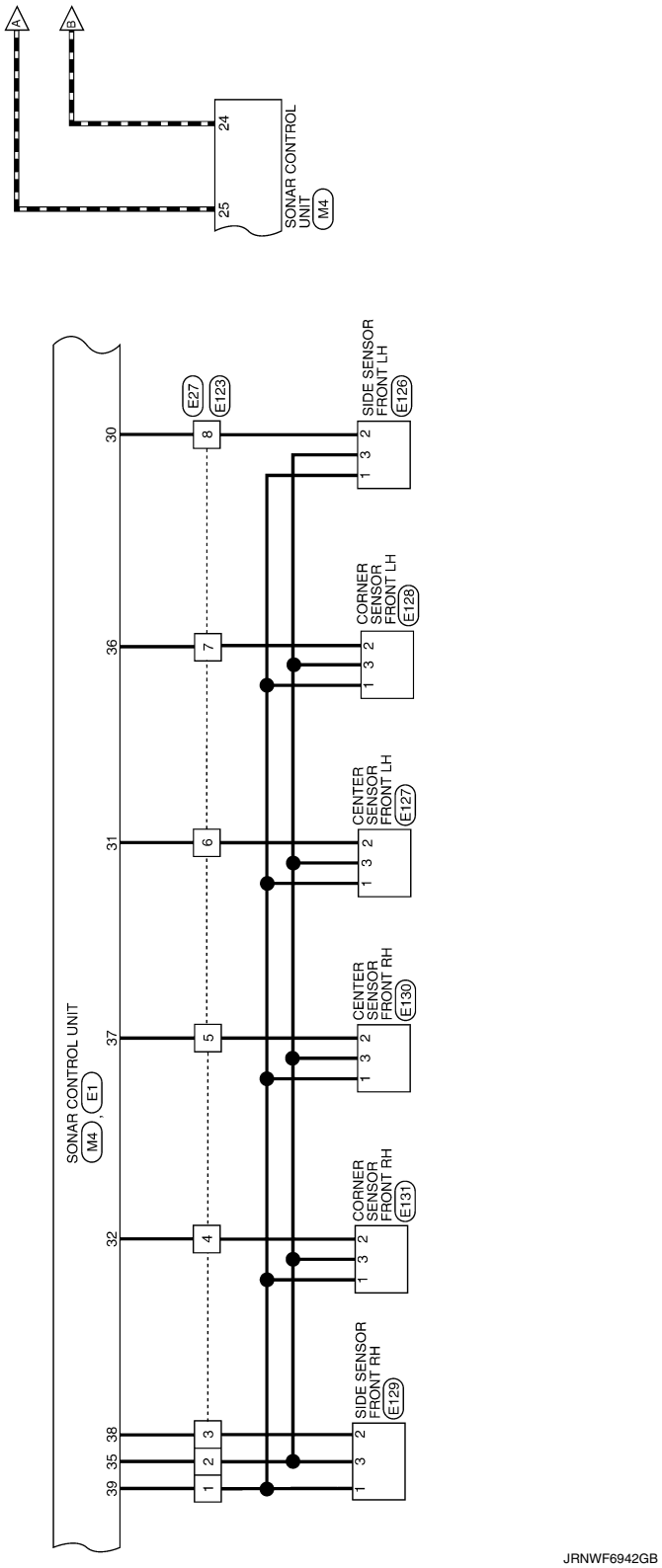
SONAR SYSTEM (FRONT 6 & REAR 6 SENSORS WITH PARK ASSIST)

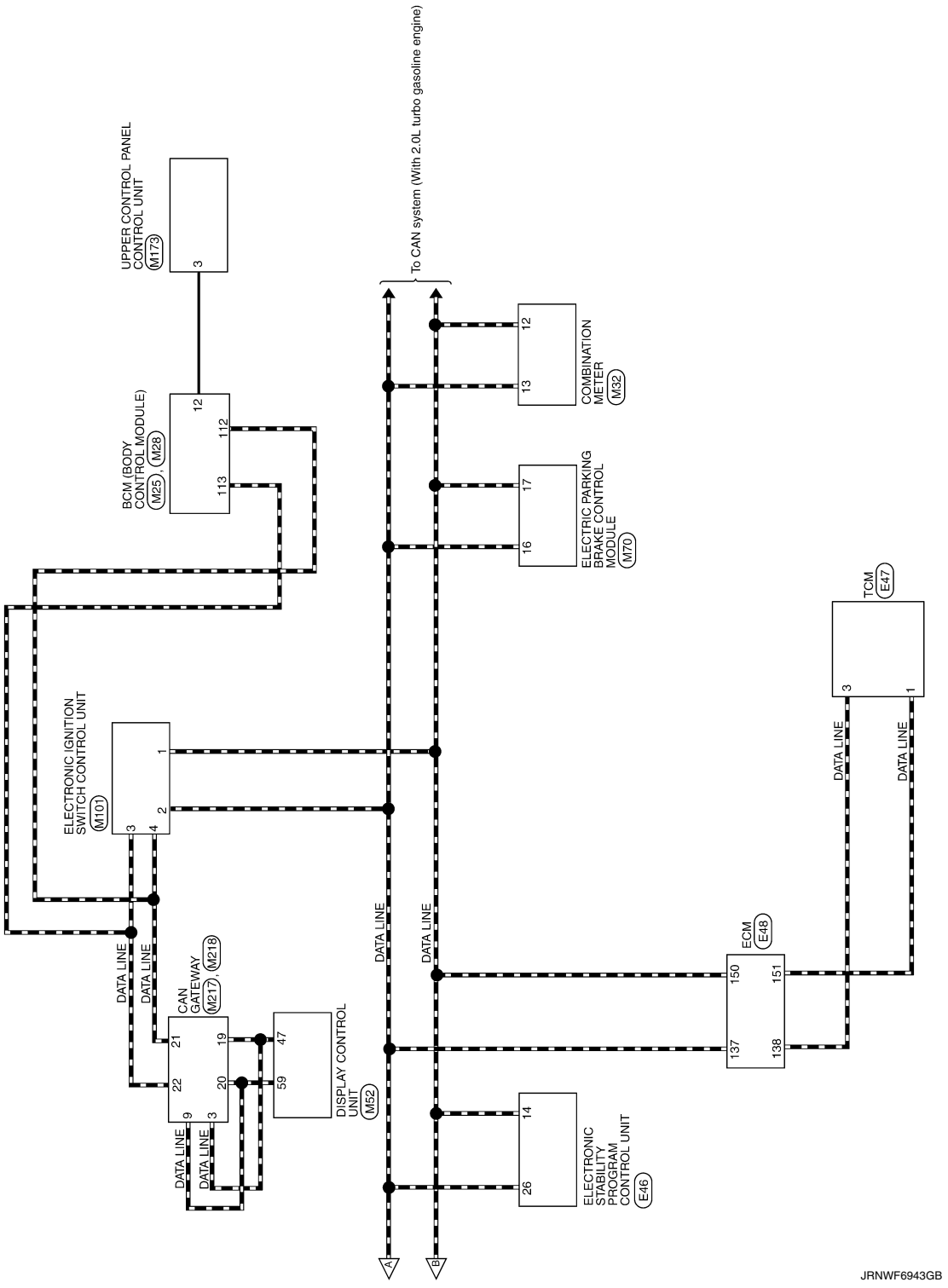
Wiring Diagram

INFOID:0000000013611634

SONAR SYSTEM (FRONT 6 & REAR 6 SENSORS WITH PARK ASSIST)




A
B
24
25
SONAR CONTROL UNIT
M4
SONAR CONTROL UNIT
M4
E1
30
36
31
37
32
38
35
39
E27
E123
8
7
6
5
4
3
2
1
SIDE SENSOR FRONT LH
E126
CORNER SENSOR FRONT LH
E128
CENTER SENSOR FRONT LH
E127
CENTER SENSOR FRONT RH
E130
CORNER SENSOR FRONT RH
E131
SIDE SENSOR FRONT RH
E129
JRNWF6942GB


To CAN system (With 2.0L turbo gasoline engine)
UPPER CONTROL PANEL CONTROL UNIT (M173)
BCM (BODY CONTROL MODULE) (M25), (M28)
COMBINATION METER (M32)
ELECTRIC PARKING BRAKE CONTROL MODULE (M70)
TCM (E47)
ELECTRONIC IGNITION SWITCH CONTROL UNIT (M101)
CAN GATEWAY (M217), (M218)
DISPLAY CONTROL UNIT (M52)
ECM (E48)
ELECTRONIC STABILITY PROGRAM CONTROL UNIT (E46)
DATA LINE
A
B
JRNWF6943GB

SONAR SYSTEM (FRONT 6 & REAR 6 SENSORS WITH PARK ASSIST)

Connector No.	E1
Connector Name	SONAR CONTROL UNIT
Connector Type	MB_A0525451626

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
30	P	SIDE SENSAR SIGNAL FRONT LH
31	Y	CENTER SENSAR SIGNAL FRONT LH
32	O	CORNER SENSAR SIGNAL FRONT RH
35	BR	FRONT SENSOR GROUND
36	R	CORNER SENSAR SIGNAL FRONT LH
37	V	CENTER SENSAR SIGNAL FRONT RH
38	L	SIDE SENSAR SIGNAL FRONT RH
39	GR	FRONT SENSOR POWER SUPPLY

Connector No.	E27
Connector Name	WIRE TO WIRE
Connector Type	RH12MB

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	GR	-
2	BR	-
3	L	-
4	O	-
5	V	-
6	Y	-
7	R	-
8	P	-

Connector No.	E46
Connector Name	ELECTRONIC STABILITY PROGRAM CONTROL UNIT
Connector Type	MB_A2465400581

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	R	MOTOR POWER SUPPLY
2	W	BRAKE PEDAL
4	P	RIGHT FRONT AXLE RPM SENSOR SIGNAL
5	GR	BRAKE VACUUM SENSOR POWER SUPPLY
6	B	BRAKE LIGHT SWITCH-L
7	R	BATTERY POWER SUPPLY
8	Y	LFET FRONT AXLE RPM SENSOR SIGNAL
10	O	STANDSTILL CONTROL (SSC) STATUS
12	P	BRAKE VACUUM SENSOR SIGNAL
13	BR	GROUND (MOTOR)
14	G	CAN-L
16	B	RIGHT FRONT AXLE RPM SENSOR POWER SUPPLY
17	Y	RIGHT REAR AXLE RPM SENSOR POWER SUPPLY
18	BR	LFET REAR AXLE RPM SENSOR SIGNAL
19	W	LFET FRONT AXLE RPM SENSOR POWER SUPPLY
23	B	BRAKE VACUUM SENSOR GROUND
25	P	VALVE RELAY POWER SUPPLY
26	W	CAN-H
28	R	BATTERY POWER SUPPLY
29	P	RIGHT REAR AXLE RPM SENSOR SIGNAL
30	V	BRAKE LIGHT SWITCH-H
31	GR	LFET REAR AXLE RPM SENSOR POWER SUPPLY
32	L	BRAKE LIGHT SWITCH GROUND
35	R	BRAKE LIGHT SWITCH POWER SUPPLY
38	B	GROUND (VALVE)

Connector No.	E47
Connector Name	TCM
Connector Type	MB_A2465450026

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	CAN-L
2	V	NOT P
3	GR	CAN-H
5	W	BATTERY POWER SUPPLY

Connector No.	E48
Connector Name	ECM
Connector Type	MB_A0075406981

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
97	R	POWER SUPPLY (ECM)
98	BR	ECM GROUND
99	V	POWER SUPPLY (ECM)
100	BR	ECM GROUND
101	R	POWER SUPPLY (ECM)
102	B	ECM GROUND
103	L	COOLING FAN CONTROL SIGNAL
104	R	SENSOR POWER SUPPLY (ACCELERATOR PEDAL POSITION SENSOR 1)
105	G	SENSOR POWER SUPPLY (ACCELERATOR PEDAL POSITION SENSOR 2)
106	BR	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR)
111	B	IGNITION SIGNAL
112	Y	POWER SUPPLY (BATTERY)
116	W	STARTER RELAY-L
119	GR	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 2)
120	O	SENSOR GROUND

122	R	HOT START SIGNAL
123	GR	MOTOR RELAY CONTROL SIGNAL
127	O	FUEL PUMP ON SIGNAL
132	G	ACCELERATOR PEDAL POSITION SENSOR 1
136	Y	POWERTRAIN SENSOR CAN-H
137	W	CAN-H
138	GR	POWERTRAIN CAN-H
141	B	WATER PUMP RELAY CONTROL SIGNAL
145	W	ACCELERATOR PEDAL POSITION SENSOR 2
146	G	FUEL TANK PRESSURE SENSOR
147	L	CRASH SIGNAL
148	W	STARTER RELAY-H
149	B	POWERTRAIN SENSOR CAN-L
150	G	CAN-L
151	L	POWERTRAIN CAN-L
152	V	EVAP CANISTER VENT CONTROL VALVE
153	BR	EVAP PURGE CONTROL VALVE

Connector No.	E123
Connector Name	WIRE TO WIRE
Connector Type	RH12FB

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	BR	-
3	Y	-
4	R	-
5	V	-
6	W	-
7	R	-
8	P	-

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SONAR SYSTEM (FRONT 6 & REAR 6 SENSORS WITH PARK ASSIST)

Connector No.	E126
Connector Name	SIDE SENSOR FRONT LH
Connector Type	MB_A2115452728

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	P	-
3	BR	-

Connector No.	E127
Connector Name	CENTER SENSOR FRONT LH
Connector Type	MB_A2115451728

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	W	-
3	BR	-

Connector No.	E128
Connector Name	CORNER SENSOR FRONT LH
Connector Type	MB_A2115451728

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	R	-
3	BR	-

Connector No.	E129
Connector Name	SIDE SENSOR FRONT RH
Connector Type	MB_A2115452728

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	Y	-
3	BR	-

Connector No.	E130
Connector Name	CENTER SENSOR FRONT RH
Connector Type	MB_A2115451728

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	V	-
3	BR	-

Connector No.	E131
Connector Name	CORNER SENSOR FRONT RH
Connector Type	MB_A2115451728

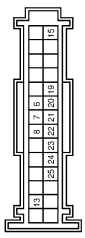
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	R	-
3	BR	-

Connector No.	M4
Connector Name	SONAR CONTROL UNIT
Connector Type	MB_A0015403081

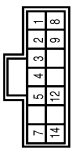
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
6	L	CORNER SENSAR SIGNAL REAR LH
7	R	CENTER SENSAR SIGNAL REAR RH
8	Y	SIDE SENSAR SIGNAL REAR RH
13	BR	GROUND
15	R	BATTERY POWER SUPPLY
19	BR	REAR SENSOR POWER SUPPLY
20	V	SIDE SENSAR SIGNAL REAR LH
21	W	CENTER SENSAR SIGNAL REAR LH
22	Y	CORNER SENSAR SIGNAL REAR RH
23	B	REAR SENSOR GROUND
24	G	CAN-L
25	W	CAN-H

Connector No.	M25
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	MB_A0075405081

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	ROTARY LIGHT SW GND
2	O	ROTARY LIGHT SW (PL/PR/TAL)
3	R	ROTARY LIGHT SW (AUTO/LOW)
4	G	ROTARY LIGHT SW (FR FOG)
5	Y	-
7	GR	SWITCH INDICATOR
8	R	CAN-H (BODY 2)
9	BR	CAN-L (BODY 2)

JRNWF6945GB

SONAR SYSTEM (FRONT 6 & REAR 6 SENSORS WITH PARK ASSIST)

12	O	LIN (IBS)
14	G	FOOT LAMP

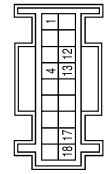
Connector No.	M28
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	MB_A1665400481

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
67	V	BACK DOOR UNLOCK
69	GR	STOP LAMP (BODY RH)
70	B	REAR TURN SIGNAL LH
71	GR	BACK-UP LAMP RH
72	Y	LICENSE PLATE LAMP RH
73	L	RR POWER WINDOW SW RH UP
74	B	RR POWER WINDOW SW RH DOWN
75	L	RR POWER WINDOW SW RH GND
76	GR	HALL SENSOR RH POWER SUPPLY
77	R	SUB BAT-
78	B	TERMINAL RELAY 15R1 CONT
80	B	REAR WIPER RELAY CONT
82	GR	TAIL LAMP (BODY LH)
83	P	TERMINAL RELAY 15R2 CONT
85	B	TAIL LAMP (BK LH)
87	R	BAT (VIA LATCHING TERMINAL RELAY 30G)
89	O	HALL SENSOR RH GND
90	V	HALL SENSOR RH SIGNAL
91	P	FUEL LEVEL SENSOR GND
92	L	FUEL LEVEL SENSOR
93	GR	FUEL LEVEL SENSOR
94	Y	FUEL FILLER LID STATUS
97	G	LATCHING TERMINAL RELAY 30G CONT 1
98	B	LATCHING TERMINAL RELAY 30G GND 1
99	W	LATCHING TERMINAL RELAY 30G GND 2
100	V	LATCHING TERMINAL RELAY 30G CONT 2
101	Y	REAR DOOR INSIDE HANDLE LAMP CONT
102	GR	AMBIENT LAMP CONT
103	V	SUB BAT RELAY CONT
105	G	RR DOOR LH UNLOCK
106	W	FUEL FILLER LID UNLOCK
107	L	RR DOOR LH LOCK
108	R	SUB BAT+
109	O	LIN (ROOF)
112	BR	CAN-L (BODY 1)
113	R	CAN-H (BODY 1)
114	B	INJECTION RELAY CONT

Connector No.	M32
Connector Name	COMBINATION METER
Connector Type	MB_A0525452726

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	BR	GROUND
4	R	BATTERY POWER SUPPLY
12	GR	CAN-L
13	W	CAN-H
17	BR	CAN-L
18	R	CAN-H

Connector No.	M50
Connector Name	WIRE TO WIRE
Connector Type	MB_A0565451928

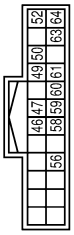
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	V	-
2	L	-
3	Y	-
4	BR	-
5	B	-
6	Y	-
7	R	-
8	W	-

Connector No.	M52
Connector Name	DISPLAY CONTROL UNIT
Connector Type	TH24FW-NH

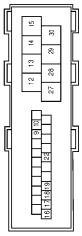
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
46	G	AV COMMUNICATION SIGNAL (L)
47	P	CAN-L
49	R	DIMMER SIGNAL
50	BR	REVERSE SIGNAL
52	B	GROUND
56	BR	CAMERA SWITCH SIGNAL
58	Y	AV COMMUNICATION SIGNAL (H)
59	L	CAN-H
60	W	IGNITION SIGNAL
61	R	VEHICLE SPEED SIGNAL (8-PULSE)
63	L	ACC POWER SUPPLY
64	Y	BATTERY POWER SUPPLY

Connector No.	M70
Connector Name	ELECTRIC PARKING BRAKE CONTROL MODULE
Connector Type	MB_A0085409281

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
9	G	ELECTRIC PARKING BRAKE SWITCH 1
10	P	ELECTRIC PARKING BRAKE SWITCH 2
12	R	MOTOR RH (+)
13	W	MOTOR POWER SUPPLY (RH)
14	R	MOTOR LH (+)
15	R	MOTOR POWER SUPPLY (LH)
16	W	CAN-H
17	G	CAN-L
18	O	ELECTRIC PARKING BRAKE SWITCH 3
19	G	ELECTRIC PARKING BRAKE SWITCH 4
22	B	POWER SUPPLY
27	Y	MOTOR RH (-)
28	BR	GROUND (MOTOR RH)
29	V	MOTOR LH (-)
30	BR	GROUND (MOTOR LH)

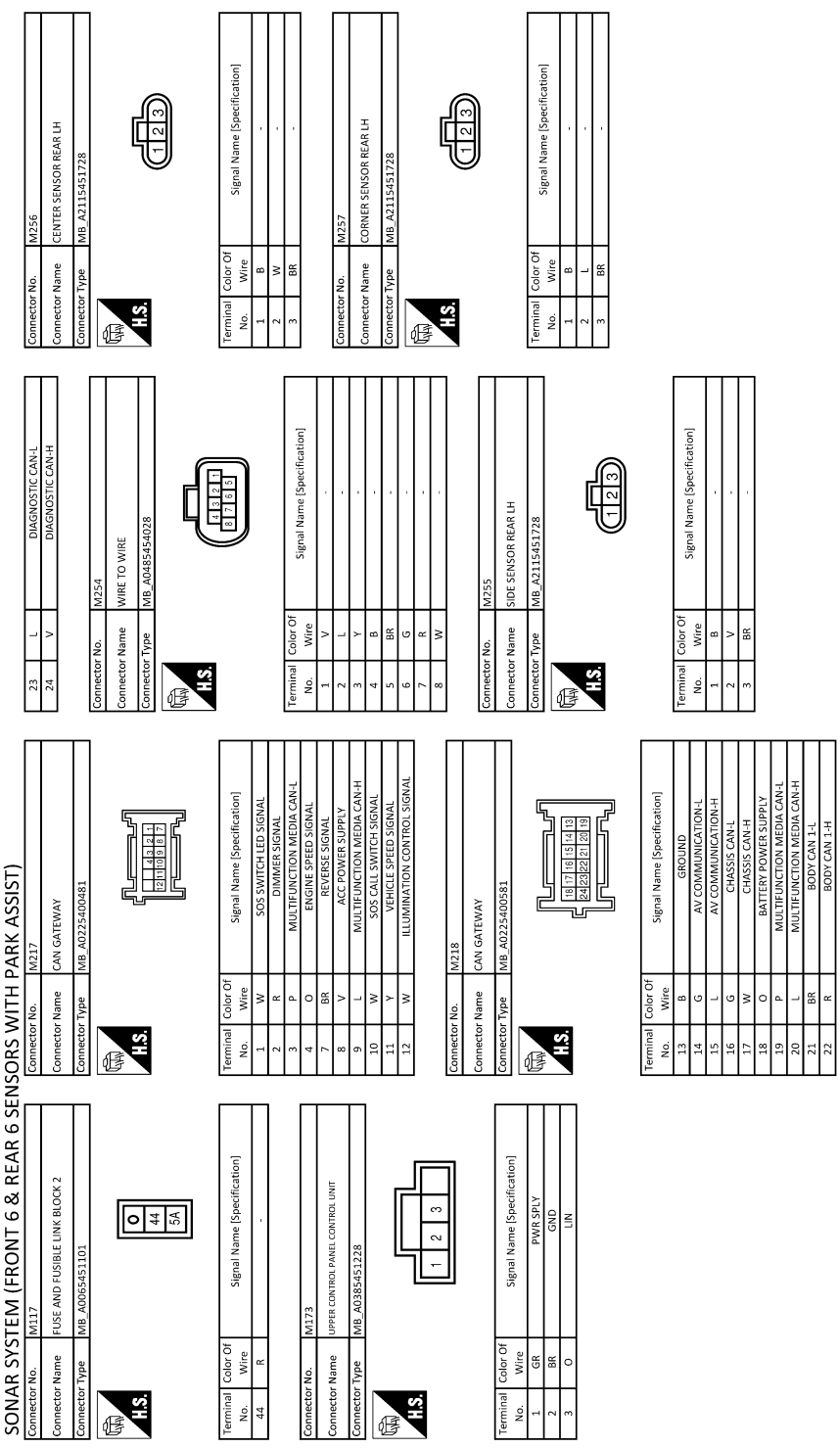
Connector No.	M101
Connector Name	ELECTRONIC IGNITION SWITCH CONTROL UNIT
Connector Type	MB_A0265458426

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	G	CHASSIS CAN-L
2	W	CHASSIS CAN-H
3	R	BODY CAN 1-H
4	BR	BODY CAN 1-L
6	W	STEERING LOCK OPERATION
9	GR	REMOTE KEYLESS
10	W	POWER SUPPLY
11	BR	DIAGNOSTIC CAN-L
12	L	DIAGNOSTIC CAN-H

JRNWF6946GB

SONAR SYSTEM (FRONT 6 & REAR 6 SENSORS WITH PARK ASSIST)



JRNWF6947GB

SONAR SYSTEM (FRONT 6 & REAR 6 SENSORS WITH PARK ASSIST)

Connector No.	M258
Connector Name	CENTER SENSOR REAR RH
Connector Type	MB_A2115451728

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	R	-
3	BR	-

Connector No.	M260
Connector Name	SIDE SENSOR REAR RH
Connector Type	MB_A2115451728

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	Y	-
3	BR	-

Connector No.	M259
Connector Name	CORNER SENSOR REAR RH
Connector Type	MB_A2115451728

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	G	-
3	BR	-

JRNWF6948GB

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000013611635

1.INTERVIEW FOR MALFUNCTION

It is also important to clarify the customer concerns before starting the inspection. Interview the customer about the concerns carefully and understand the symptoms fully.

NOTE:

The customers are not professionals. Never assume that “maybe the customer means···” or “maybe the customer mentioned this symptom”.

>> GO TO 2.

2.SELF-DIAGNOSIS WITH CONSULT

With CONSULT

Perform self-diagnosis of “Parking assist” using CONSULT. Refer to SN-30, "CONSULT Function".

NOTE:

Skip to step 4 of the diagnosis procedure if “Parking assist” is not displayed.

Is any DTC detected?

YES >> GO TO 3.
NO >> GO TO 4.

3.TROUBLE DIAGNOSIS FOR DTC

1. Check the DTC indicated in the “Self Diagnostic Result”.
2. When DTC is detected, follow the instructions below:

- Record DTC
- Freeze Frame Data (FFD)

3. Perform the relevant diagnosis referring to the DTC Index. Refer to SN-39, "DTC Index".

>> GO TO 5.

4.FUNCTIONING CHECK WITH CONSULT

With CONSULT

1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> GO TO 7.
NO >> GO TO 2.

5.MALFUNCTIONING PART REPAIR

Repair or replace the identified malfunctioning parts.

>> GO TO 6.

6.REPAIR CHECK (SELF-DIAGNOSIS WITH CONSULT)

With CONSULT

1. Erases self-diagnosis results.
2. Perform self-diagnosis of “Parking assist” again after repairing or replacing the specific items.
3. Check if any DTC is detected in self-diagnosis results of “Parking assist”.

Is any DTC detected?

YES >> GO TO 3.
NO >> GO TO 7.

7.OPERATION TEST

Perform operation test. Check that the malfunction symptom is solved or no other symptoms occur.

Is there a malfunction symptom?

YES >> GO TO 2.
NO >> INSPECTION END

ADDITIONAL SERVICE WHEN REPLACING SONAR CONTROL UNIT

Description

INFOID:0000000013611636

Perform the following operations when replacing sonar control unit. Refer to SN-60, "Work Procedure".

Work Procedure

INFOID:0000000013611637

1.SONAR CONTROL UNIT CONFIGURATION

With CONSULT
Perform the sonar control unit configuration with CONSULT. Refer to SN-61, "Description".

>> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

With CONSULT
1. Perform self-diagnosis of “Park assist” using CONSULT.
2. Check if any DTC is detected.

Is any DTC detected?

YES >> Perform the trouble diagnosis for the detected DTC. Refer to SN-39, "DTC Index".
NO >> WORK END

CONFIGURATION (SONAR CONTROL UNIT)

Description

INFOID:0000000013611638

Vehicle specification needs to be written with CONSULT because it is not written after replacing the sonar control unit.
The configuration requires network connection. CONSULT connects to network and then it downloads the configuration data from the server. Then CONSULT writes the vehicle specification to the sonar control unit.
Refer to SN-61, "Work Procedure".
NOTE:
For details the network connection and operation, refer to “CONSULT Operation Manual”.
The configuration no need to “save” configuration data from the sonar control unit. The configuration data is always generated freshly at the server and then downloaded to the CONSULT.
CAUTION:
Follow the instructions listed below.
- **Complete the procedure of “Read / Write Configuration” in order.**
- **If incorrect “Read / Write Configuration”, incidents might occur.**
- **Never perform “Read / Write Configuration” except for new sonar control unit.**

Work Procedure

INFOID:0000000013611639

1.WRITING VEHICLE SPECIFICATION

CONSULT Configuration
Perform “WRITE CONFIGURATION” for CONTROL UNIT according to “CONSULT Operation Manual”.
NOTE:
- Log in the network according to CONSULT guidance.
- For details the network connection and operation, refer to “CONSULT Operation Manual”.

>> WORK END

DTC/CIRCUIT DIAGNOSIS

B122B SIDE SENSOR [RR]

DTC Description

INFOID:0000000013611640

DTC DETECTION LOGIC

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B122B	09	Outer RR distance sen has malf (The outer right rear distance sensor has a malfunction)	[COMPONENT MALFUNCTION]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Verify error)
					Diagnosis delay time	7.5 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (ASIC error)
					Diagnosis delay time	1.3 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Incident radiation error)
					Diagnosis delay time	1.2 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B122B	12	Outer RR distance sen has malf (The outer right rear distance sensor has a malfunction)	[CIRC SHORT TO BATTERY]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sonar sensor signal
				Threshold		Short circuit to power supply
				Diagnosis delay time		2.0 seconds or more
B122B	14	Outer RR distance sen has malf (The outer right rear distance sensor has a malfunction)	[CIRC SHORT TO GROUND OR OPEN]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Short circuit to ground
					Diagnosis delay time	2.0 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Open circuit
					Diagnosis delay time	2.0 seconds or more
B122B	23	Outer RR distance sen has malf (The outer right rear distance sensor has a malfunction)	[SIGNAL STUCK LOW]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sensor ground signal
				Threshold		Open circuit
				Diagnosis delay time		2.0 seconds or more

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B122B	95	Outer RR distance sen has malf (The outer right rear distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	1.5 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	1.5 seconds or more

POSSIBLE CAUSE

09 [COMPONENT MALFUNCTION]
Internal error of the sonar side sensor rear RH

12 [CIRC SHORT TO BATTERY]
Short circuit of the sonar sensor signal to power supply circuit.
(Is detected by communication between sonar side sensor rear RH and sonar control unit)

14 [CIRC SHORT TO GROUND OR OPEN]
- Short circuit of the sonar sensor signal to ground
  (Is detected by communication between sonar side sensor rear RH and sonar control unit)
- Open circuit of the sonar sensor signal
  (Is detected by communication between sonar side sensor rear RH and sonar control unit)

23 [SIGNAL STUCK LOW]
Open circuit of the sonar sensor ground circuit
(Is detected by communication between sonar side sensor rear RH and sonar control unit)

95 [INCORRECT ASSEMBLY]
- Icing of the sonar side sensor rear RH
- Pollution of the sonar side sensor rear RH
- Improper installation of sonar side sensor rear RH

FAIL-SAFE

The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Turn ignition switch ON and wait at least 10 seconds or more.

2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “B122B-09”, “B122B-12”, “B122B-14”, “B122B-23” or “B122B-95” detected?

YES >> Proceed to SN-65, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611641

B122B-09

1.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor rear RH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 2.

2.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B122B-12

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and side sensor rear RH connector.
3. Turn ignition switch ON.
4. Check the voltage between sonar control unit harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Sonar control unit			
Connector	Terminal		
M4	8	Ground	0 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor rear RH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and side sensor rear RH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-62, "DTC Description".

Is DTC “B122B-12” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B122B-14

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and side sensor rear RH connector.
3. Check continuity between sonar control unit harness connector and side sensor rear RH harness connector.

Sonar control unit		Side sensor rear RH		Continuity
Connector	Terminal	Connector	Terminal	
M4	8	M260	2	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

Check continuity between sonar control unit harness connector and ground.

Terminals			Continuity
(+)		(−)	
Sonar control unit			
Connector	Terminal		
M4	8	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace harness or connector.

3.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor rear RH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and side sensor rear RH connector.
2. Turn ignition switch ON.

3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-62, "DTC Description".

Is DTC “B122B-14” detected as the current malfunction?

YES >> GO TO 5.
NO >> GO TO 6.

5.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 6.

6.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B122B-23

1.CHECK SONAR SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and side sensor rear RH connector.
3. Check continuity between sonar control unit harness connector and side sensor rear RH harness connector.

Sonar control unit		Side sensor rear RH		Continuity
Connector	Terminal	Connector	Terminal	
M4	23	M260	3	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor rear RH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and side sensor rear RH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-62, "DTC Description".

Is DTC “B122B-23” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B122B-95

1.CHECK SONAR SENSOR POLLUTION

Check sonar sensor pollution.

Is the sonar sensor dirty?

YES >> GO TO 2.
NO >> GO TO 3.

2.CLEAN SONAR SENSOR

Clean sonar sensor.

>> GO TO 8.

3. CHECK SENSOR FOR TIGHT SEATING

Manually check sensor for tight seating.

Is the sonar sensor properly installed?

YES >> GO TO 4.
NO >> GO TO 5.

4. CHECK SENSOR INSTALLATION POSITION

Check whether the sonar sensor is seated in the center of the bumper opening.

Is the sonar sensor properly installed?

YES >> GO TO 6.
NO >> GO TO 5.

5.PROPERLY INSTALL SONAR SENSOR

Properly install sonar sensor.

>> GO TO 8.

6. CHECK SONAR SENSOR DAMAGED

Check whether the sonar sensor membrane has been damaged by stone chipping.

Does the sonar sensor have damage caused by stone chipping?

YES >> GO TO 7.
NO >> GO TO 8.

7.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor rear RH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 8.

8.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.

3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1230 CORNER SENSOR [RR]

DTC Description

INFOID:0000000013611642

DTC DETECTION LOGIC

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B1230	09	Center RR distance sen has malf (The center right rear distance sensor has a malfunction)	[COMPONENT MALFUNCTION]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Verify error)
					Diagnosis delay time	7.5 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (ASIC error)
					Diagnosis delay time	1.3 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Incident radiation error)
					Diagnosis delay time	1.2 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B1230	12	Center RR distance sen has malf (The center right rear distance sensor has a malfunction)	[CIRC SHORT TO BATTERY]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sonar sensor signal
				Threshold		Short circuit to power supply.
				Diagnosis delay time		2.0 seconds or more
B1230	14	Center RR distance sen has malf (The center right rear distance sensor has a malfunction)	[CIRC SHORT TO GROUND OR OPEN]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Short circuit to ground
					Diagnosis delay time	2.0 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Open circuit
					Diagnosis delay time	2.0 seconds or more
B1230	23	Center RR distance sen has malf (The center right rear distance sensor has a malfunction)	[SIGNAL STUCK LOW]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sensor ground signal
				Threshold		Open circuit
				Diagnosis delay time		2.0 seconds or more

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B1230	95	Center RR distance sen has malf (The center right rear distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: 5 km/h (3.1 MPH) < Vehicle speed < 12 km/h (7.5 MPH) • Constant sensor distance value: 10 cm (3.9 in) < distance < 35 cm (13.8 in) **NOTE:** Vehicle speed and sensor distance must be present for at least 6 seconds • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	15 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: 5 km/h (3.1 MPH) < Vehicle speed < 12 km/h (7.5 MPH) • Constant sensor distance value: 10 cm (3.9 in) < distance < 35 cm (13.8 in) **NOTE:** Vehicle speed and sensor distance must be present for at least 6 seconds • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	15 seconds or more

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B1230	95	Center RR distance sen has malf (The center right rear distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	1.5 seconds or more
				4	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	1.5 seconds or more

POSSIBLE CAUSE

09 [COMPONENT MALFUNCTION]
Internal error of the sonar corner sensor rear RH

12 [CIRC SHORT TO BATTERY]
Short circuit of the sonar sensor signal to power supply circuit.
(Is detected by communication between sonar corner sensor rear RH and sonar control unit)

14 [CIRC SHORT TO GROUND OR OPEN]
- Short circuit of the sonar sensor signal to ground
  (Is detected by communication between sonar corner sensor rear RH and sonar control unit)
- Open circuit of the sonar sensor signal
  (Is detected by communication between sonar corner sensor rear RH and sonar control unit)

23 [SIGNAL STUCK LOW]
Open circuit of the sonar sensor ground circuit
(Is detected by communication between sonar corner sensor rear RH and sonar control unit)

95 [INCORRECT ASSEMBLY]
- Icing of the sonar corner sensor rear RH
- Pollution of the sonar corner sensor rear RH
- Improper installation of sonar corner sensor rear RH

FAIL-SAFE

The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.

DTC CONFIRMATION PROCEDURE

B1230-09, B1230-12, B1230-14, B1230-23

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Turn ignition switch ON and wait at least 10 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “B1230-09”, “B1230-12”, “B1230-14” or “B1230-23” detected?

YES >> Proceed to SN-74, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

B1230-95

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Lift up drive wheel or vehicle.
2. Place an obstacle (e.g. tool box) near sonar corner sensor rear RH [approximately 30 cm (11.8 in) from the sensor].
   NOTE:
   Be careful not to allow the obstacle to contact with the vehicle.
3. Start the engine.
4. Keep the vehicle speed at approximately 10 km/h (6.2 MPH) for at least 15 seconds.
5. Stop the vehicle.
6. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
7. Check DTC.

Is DTC “B1230-95” detected?

YES >> Proceed to SN-74, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611643

B1230-09

1.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor rear RH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 2.

2.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1230-12

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and corner sensor rear RH connector.
3. Turn ignition switch ON.
4. Check the voltage between sonar control unit harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Sonar control unit			
Connector	Terminal		
M4	22	Ground	0 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor rear RH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and corner sensor rear RH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-70, "DTC Description".

Is DTC “B1230-12” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1230-14

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and corner sensor rear RH connector.
3. Check continuity between sonar control unit harness connector and corner sensor rear RH harness connector.

Sonar control unit		Corner sensor rear RH		Continuity
Connector	Terminal	Connector	Terminal	
M4	22	M259	2	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

Check continuity between sonar control unit harness connector and ground.

Terminals			Continuity
(+)		(−)	
Sonar control unit			
Connector	Terminal		
M4	22	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace harness or connector.

3.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor rear RH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and corner sensor rear RH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-70, "DTC Description".

Is DTC “B1230-14” detected as the current malfunction?

YES >> GO TO 5.
NO >> GO TO 6.

5.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 6.

6.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1230-23

1.CHECK SONAR SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and corner sensor rear RH connector.
3. Check continuity between sonar control unit harness connector and corner sensor rear RH harness connector.

Sonar control unit		Corner sensor rear RH		Continuity
Connector	Terminal	Connector	Terminal	
M4	23	M259	3	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor rear RH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and corner sensor rear RH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-70, "DTC Description".

Is DTC “B1230-23” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1230-95

1.CHECK SONAR SENSOR POLLUTION

Check sonar sensor pollution.

Is the sonar sensor dirty?

YES >> GO TO 2.
NO >> GO TO 3.

2.CLEAN SONAR SENSOR

Clean sonar sensor.

>> GO TO 8.

3. CHECK SENSOR FOR TIGHT SEATING

Manually check sensor for tight seating.

Is the sonar sensor properly installed?

YES >> GO TO 4.
NO >> GO TO 5.

4. CHECK SENSOR INSTALLATION POSITION

Check whether the sonar sensor is seated in the corner of the bumper opening.

Is the sonar sensor properly installed?

YES >> GO TO 6.
NO >> GO TO 5.

5. PROPERLY INSTALL SONAR SENSOR

Properly install sonar sensor.

>> GO TO 8.

6. CHECK SONAR SENSOR DAMAGED

Check whether the sonar sensor membrane has been damaged by stone chipping.

Does the sonar sensor have damage caused by stone chipping?

YES >> GO TO 7.
NO >> GO TO 8.

7. REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor rear RH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 8.

8. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1235 CENTER SENSOR [RR]

DTC Description

INFOID:0000000013611644

DTC DETECTION LOGIC

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B1235	09	Inner RR distance sen has malf (The inner right rear distance sensor has a malfunction)	[COMPONENT MALFUNCTION]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Verify error)
					Diagnosis delay time	7.5 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (ASIC error)
					Diagnosis delay time	1.3 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Incident radiation error)
					Diagnosis delay time	1.2 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B1235	12	Inner RR distance sen has malf (The inner right rear distance sensor has a malfunction)	[CIRC SHORT TO BATTERY]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sonar sensor signal
				Threshold		Short circuit to power supply.
				Diagnosis delay time		2.0 seconds or more
B1235	14	Inner RR distance sen has malf (The inner right rear distance sensor has a malfunction)	[CIRC SHORT TO GROUND OR OPEN]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Short circuit to ground
					Diagnosis delay time	2.0 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Open circuit
					Diagnosis delay time	2.0 seconds or more
B1235	23	Inner RR distance sen has malf (The inner right rear distance sensor has a malfunction)	[SIGNAL STUCK LOW]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sensor ground signal
				Threshold		Open circuit
				Diagnosis delay time		2.0 seconds or more

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B1235	95	Inner RR distance sen has malf (The inner right rear distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: 5 km/h (3.1 MPH) < Vehicle speed < 12 km/h (7.5 MPH) • Constant sensor distance value: 10 cm (3.9 in) < distance < 35 cm (13.8 in) **NOTE:** Vehicle speed and sensor distance must be present for at least 6 seconds • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	15 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: 5 km/h (3.1 MPH) < Vehicle speed < 12 km/h (7.5 MPH) • Constant sensor distance value: 10 cm (3.9 in) < distance < 35 cm (13.8 in) **NOTE:** Vehicle speed and sensor distance must be present for at least 6 seconds • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	15 seconds or more

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B1235	95	Inner RR distance sen has malf (The inner right rear distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	1.5 seconds or more
				4	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	1.5 seconds or more

POSSIBLE CAUSE

09 [COMPONENT MALFUNCTION]
Internal error of the sonar center sensor rear RH

12 [CIRC SHORT TO BATTERY]
Short circuit of the sonar sensor signal to power supply circuit.
(Is detected by communication between sonar center sensor rear RH and sonar control unit)

14 [CIRC SHORT TO GROUND OR OPEN]
- Short circuit of the sonar sensor signal to ground
  (Is detected by communication between sonar center sensor rear RH and sonar control unit)
- Open circuit of the sonar sensor signal
  (Is detected by communication between sonar center sensor rear RH and sonar control unit)

23 [SIGNAL STUCK LOW]
Open circuit of the sonar sensor ground circuit
(Is detected by communication between sonar center sensor rear RH and sonar control unit)

95 [INCORRECT ASSEMBLY]
- Icing of the sonar center sensor rear RH
- Pollution of the sonar center sensor rear RH
- Improper installation of sonar center sensor rear RH

FAIL-SAFE

The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.

DTC CONFIRMATION PROCEDURE

B1235-09, B1235-12, B1235-14, B1235-23

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Turn ignition switch ON and wait at least 10 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “B1235-09”, “B1235-12”, “B1235-14” or “B1235-23” detected?

YES >> Proceed to SN-83, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

B1235-95

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Lift up drive wheel or vehicle.
2. Place an obstacle (e.g. tool box) near sonar center sensor rear RH [approximately 30 cm (11.8 in) from the sensor].
   NOTE:
   Be careful not to allow the obstacle to contact with the vehicle.
3. Start the engine.
4. Keep the vehicle speed at approximately 10 km/h (6.2 MPH) for at least 15 seconds.
5. Stop the vehicle.
6. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
7. Check DTC.

Is DTC “B1235-95” detected?

YES >> Proceed to SN-83, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611645

B1235-09

1.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor rear RH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 2.

2.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1235-12

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and center sensor rear RH connector.
3. Turn ignition switch ON.
4. Check the voltage between sonar control unit harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Sonar control unit			
Connector	Terminal		
M4	7	Ground	0 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor rear RH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and center sensor rear RH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-79, "DTC Description".

Is DTC “B1235-12” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1235-14

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and center sensor rear RH connector.
3. Check continuity between sonar control unit harness connector and center sensor rear RH harness connector.

Sonar control unit		Center sensor rear RH		Continuity
Connector	Terminal	Connector	Terminal	
M4	7	M258	2	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

Check continuity between sonar control unit harness connector and ground.

Terminals			Continuity
(+)		(–)	
Sonar control unit			
Connector	Terminal		
M4	7	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace harness or connector.

3.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor rear RH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and center sensor rear RH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-79, "DTC Description".

Is DTC “B1235-14” detected as the current malfunction?

YES >> GO TO 5.
NO >> GO TO 6.

5.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 6.

6.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1235-23

1.CHECK SONAR SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and center sensor rear RH connector.
3. Check continuity between sonar control unit harness connector and center sensor rear RH harness connector.

Sonar control unit		Center sensor rear RH		Continuity
Connector	Terminal	Connector	Terminal	
M4	23	M258	3	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor rear RH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and center sensor rear RH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-79, "DTC Description".

Is DTC “B1235-23” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1235-95

1.CHECK SONAR SENSOR POLLUTION

Check sonar sensor pollution.

Is the sonar sensor dirty?

YES >> GO TO 2.
NO >> GO TO 3.

2.CLEAN SONAR SENSOR

Clean sonar sensor.

>> GO TO 8.

3. CHECK SENSOR FOR TIGHT SEATING

Manually check sensor for tight seating.

Is the sonar sensor properly installed?

YES >> GO TO 4.
NO >> GO TO 5.

4. CHECK SENSOR INSTALLATION POSITION

Check whether the sonar sensor is seated in the center of the bumper opening.

Is the sonar sensor properly installed?

YES >> GO TO 6.
NO >> GO TO 5.

5. PROPERLY INSTALL SONAR SENSOR

Properly install sonar sensor.

>> GO TO 8.

6. CHECK SONAR SENSOR DAMAGED

Check whether the sonar sensor membrane has been damaged by stone chipping.

Does the sonar sensor have damage caused by stone chipping?

YES >> GO TO 7.
NO >> GO TO 8.

7. REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor rear RH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 8.

8. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B123A CENTER SENSOR [RL]

DTC Description

INFOID:0000000013611646

DTC DETECTION LOGIC

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B123A	09	Inner RL distance sen has malf (The inner left rear distance sensor has a malfunction)	[COMPONENT MALFUNCTION]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Verify error)
					Diagnosis delay time	7.5 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (ASIC error)
					Diagnosis delay time	1.3 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Incident radiation error)
					Diagnosis delay time	1.2 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B123A	12	Inner RL distance sen has malf (The inner left rear distance sensor has a malfunction)	[CIRC SHORT TO BATTERY]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sonar sensor signal
				Threshold		Short circuit to power supply.
				Diagnosis delay time		2.0 seconds or more
B123A	14	Inner RL distance sen has malf (The inner left rear distance sensor has a malfunction)	[CIRC SHORT TO GROUND OR OPEN]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Short circuit to ground
					Diagnosis delay time	2.0 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Open circuit
					Diagnosis delay time	2.0 seconds or more
B123A	23	Inner RL distance sen has malf (The inner left rear distance sensor has a malfunction)	[SIGNAL STUCK LOW]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sensor ground signal
				Threshold		Open circuit
				Diagnosis delay time		2.0 seconds or more

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B123A	95	Inner RL distance sen has malf (The inner left rear distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: 5 km/h (3.1 MPH) < Vehicle speed < 12 km/h (7.5 MPH) • Constant sensor distance value: 10 cm (3.9 in) < distance < 35 cm (13.8 in) **NOTE:** Vehicle speed and sensor distance must be present for at least 6 seconds • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	15 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: 5 km/h (3.1 MPH) < Vehicle speed < 12 km/h (7.5 MPH) • Constant sensor distance value: 10 cm (3.9 in) < distance < 35 cm (13.8 in) **NOTE:** Vehicle speed and sensor distance must be present for at least 6 seconds • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	15 seconds or more

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B123A	95	Inner RL distance sen has malf (The inner left rear distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	1.5 seconds or more
				4	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	1.5 seconds or more

POSSIBLE CAUSE

09 [COMPONENT MALFUNCTION]
Internal error of the sonar center sensor rear LH

12 [CIRC SHORT TO BATTERY]
Short circuit of the sonar sensor signal to power supply circuit.
(Is detected by communication between sonar center sensor rear LH and sonar control unit)

14 [CIRC SHORT TO GROUND OR OPEN]
- Short circuit of the sonar sensor signal to ground
  (Is detected by communication between sonar center sensor rear LH and sonar control unit)
- Open circuit of the sonar sensor signal
  (Is detected by communication between sonar center sensor rear LH and sonar control unit)

23 [SIGNAL STUCK LOW]
Open circuit of the sonar sensor ground circuit
(Is detected by communication between sonar center sensor rear LH and sonar control unit)

95 [INCORRECT ASSEMBLY]
- Icing of the sonar center sensor rear LH
- Pollution of the sonar center sensor rear LH
- Improper installation of sonar center sensor rear LH

FAIL-SAFE

The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.

DTC CONFIRMATION PROCEDURE

B123A-09, B123A-12, B123A-14, B123A-23

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Turn ignition switch ON and wait at least 10 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “B123A-09”, “B123A-12”, “B123A-14” or “B123A-23” detected?

YES >> Proceed to SN-92, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

B123A-95

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Lift up drive wheel or vehicle.
2. Place an obstacle (e.g. tool box) near sonar center sensor rear LH [approximately 30 cm (11.8 in) from the sensor].
   NOTE:
   Be careful not to allow the obstacle to contact with the vehicle.
3. Start the engine.
4. Keep the vehicle speed at approximately 10 km/h (6.2 MPH) for at least 15 seconds.
5. Stop the vehicle.
6. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
7. Check DTC.

Is DTC “B123A-95” detected?

YES >> Proceed to SN-92, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611647

B123A-09

1.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor rear LH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 2.

2.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B123A-12

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and center sensor rear LH connector.
3. Turn ignition switch ON.
4. Check the voltage between sonar control unit harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Sonar control unit			
Connector	Terminal		
M4	21	Ground	0 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor rear LH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and center sensor rear LH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-88, "DTC Description".

Is DTC “B123A-12” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B123A-14

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and center sensor rear LH connector.
3. Check continuity between sonar control unit harness connector and center sensor rear LH harness connector.

Sonar control unit		Center sensor rear LH		Continuity
Connector	Terminal	Connector	Terminal	
M4	21	M256	2	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

Check continuity between sonar control unit harness connector and ground.

Terminals			Continuity
(+)		(−)	
Sonar control unit			
Connector	Terminal		
M4	21	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace harness or connector.

3.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor rear LH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and center sensor rear LH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-88, "DTC Description".

Is DTC “B123A-14” detected as the current malfunction?

YES >> GO TO 5.
NO >> GO TO 6.

5.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 6.

6.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B123A-23

1.CHECK SONAR SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and center sensor rear LH connector.
3. Check continuity between sonar control unit harness connector and center sensor rear LH harness connector.

Sonar control unit		Center sensor rear LH		Continuity
Connector	Terminal	Connector	Terminal	
M4	23	M256	3	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor rear LH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and center sensor rear LH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-88, "DTC Description".

Is DTC “B123A-23” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Connect sonar control unit connector and center sensor rear LH connector.
2. Turn ignition switch ON.
3. Select “Work support” mode of “Parking assist” using CONSULT.
4. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B123A-95

1.CHECK SONAR SENSOR POLLUTION

Check sonar sensor pollution.

Is the sonar sensor dirty?

YES >> GO TO 2.
NO >> GO TO 3.

2.CLEAN SONAR SENSOR

Clean sonar sensor.

>> GO TO 8.

3. CHECK SENSOR FOR TIGHT SEATING

Manually check sensor for tight seating.

Is the sonar sensor properly installed?

YES >> GO TO 4.
NO >> GO TO 5.

4. CHECK SENSOR INSTALLATION POSITION

Check whether the sonar sensor is seated in the center of the bumper opening.

Is the sonar sensor properly installed?

YES >> GO TO 6.
NO >> GO TO 5.

5. PROPERLY INSTALL SONAR SENSOR

Properly install sonar sensor.

>> GO TO 8.

6. CHECK SONAR SENSOR DAMAGED

Check whether the sonar sensor membrane has been damaged by stone chipping.

Does the sonar sensor have damage caused by stone chipping?

YES >> GO TO 7.
NO >> GO TO 8.

7. REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor rear LH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 8.

8. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1244 SIDE SENSOR [FL]

DTC Description

INFOID:0000000013611648

DTC DETECTION LOGIC

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B1244	09	Outer FL distance sen has malf (The outer left front distance sensor has a malfunction)	[COMPONENT MALFUNCTION]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Verify error)
					Diagnosis delay time	7.5 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (ASIC error)
					Diagnosis delay time	1.3 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Incident radiation error)
					Diagnosis delay time	1.2 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B1244	12	Outer FL distance sen has malf (The outer left front distance sensor has a malfunction)	[CIRC SHORT TO BATTERY]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sonar sensor signal
				Threshold		Short circuit to power supply.
				Diagnosis delay time		2.0 seconds or more
B1244	14	Outer FL distance sen has malf (The outer left front distance sensor has a malfunction)	[CIRC SHORT TO GROUND OR OPEN]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Short circuit to ground
					Diagnosis delay time	2.0 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Open circuit
					Diagnosis delay time	2.0 seconds or more
B1244	23	Outer FL distance sen has malf (The outer left front distance sensor has a malfunction)	[SIGNAL STUCK LOW]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sensor ground signal
				Threshold		Open circuit
				Diagnosis delay time		2.0 seconds or more

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B1244	95	Outer FL distance sen has malf (The outer left front distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	1.5 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	1.5 seconds or more

POSSIBLE CAUSE

09 [COMPONENT MALFUNCTION]
Internal error of the sonar side sensor front LH

12 [CIRC SHORT TO BATTERY]
Short circuit of the sonar sensor signal to power supply circuit.
(Is detected by communication between sonar side sensor front LH and sonar control unit)

14 [CIRC SHORT TO GROUND OR OPEN]
- Short circuit of the sonar sensor signal to ground
  (Is detected by communication between sonar side sensor front LH and sonar control unit)
- Open circuit of the sonar sensor signal
  (Is detected by communication between sonar side sensor front LH and sonar control unit)

23 [SIGNAL STUCK LOW]
Open circuit of the sonar sensor ground circuit
(Is detected by communication between sonar side sensor front LH and sonar control unit)

95 [INCORRECT ASSEMBLY]
- Icing of the sonar side sensor front LH
- Pollution of the sonar side sensor front LH
- Improper installation of sonar side sensor front LH

FAIL-SAFE

The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Turn ignition switch ON and wait at least 10 seconds or more.

2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “B1244-09”, “B1244-12”, “B1244-14”, “B1244-23” or “B1244-95” detected?

YES >> Proceed to SN-100, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611649

B1244-09

1.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor front LH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 2.

2.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1244-12

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and side sensor front LH connector.
3. Turn ignition switch ON.
4. Check the voltage between sonar control unit harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Sonar control unit			
Connector	Terminal		
E1	30	Ground	0 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor front LH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and side sensor front LH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-97, "DTC Description".

Is DTC “B1244-12” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4. REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1244-14

1. CHECK SONAR SENSOR SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and side sensor front LH connector.
3. Check continuity between sonar control unit harness connector and side sensor front LH harness connector.

Sonar control unit		Side sensor front LH		Continuity
Connector	Terminal	Connector	Terminal	
E1	30	E126	2	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2. CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

Check continuity between sonar control unit harness connector and ground.

Terminals			Continuity
(+)		(–)	
Sonar control unit			
Connector	Terminal		
E1	30	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace harness or connector.

3. REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor front LH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 4.

4. PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and side sensor front LH connector.
2. Turn ignition switch ON.

3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-97, "DTC Description".

Is DTC “B1244-14” detected as the current malfunction?

YES >> GO TO 5.
NO >> GO TO 6.

5.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 6.

6.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1244-23

1.CHECK SONAR SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and side sensor front LH connector.
3. Check continuity between sonar control unit harness connector and side sensor front LH harness connector.

Sonar control unit		Side sensor front LH		Continuity
Connector	Terminal	Connector	Terminal	
E1	35	E126	3	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor front LH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and side sensor front LH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-97, "DTC Description".

Is DTC “B1244-23” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1244-95

1.CHECK SONAR SENSOR POLLUTION

Check sonar sensor pollution.

Is the sonar sensor dirty?

YES >> GO TO 2.
NO >> GO TO 3.

2.CLEAN SONAR SENSOR

Clean sonar sensor.

>> GO TO 8.

3. CHECK SENSOR FOR TIGHT SEATING

Manually check sensor for tight seating.

Is the sonar sensor properly installed?

YES >> GO TO 4.
NO >> GO TO 5.

4. CHECK SENSOR INSTALLATION POSITION

Check whether the sonar sensor is seated in the center of the bumper opening.

Is the sonar sensor properly installed?

YES >> GO TO 6.
NO >> GO TO 5.

5.PROPERLY INSTALL SONAR SENSOR

Properly install sonar sensor.

>> GO TO 8.

6. CHECK SONAR SENSOR DAMAGED

Check whether the sonar sensor membrane has been damaged by stone chipping.

Does the sonar sensor have damage caused by stone chipping?

YES >> GO TO 7.
NO >> GO TO 8.

7.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor front LH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 8.

8.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.

3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1249 CORNER SENSOR [FL]

DTC Description

INFOID:0000000013611650

DTC DETECTION LOGIC

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B1249	09	Center FL distance sen has malf (The center left front distance sensor has a malfunction)	[COMPONENT MALFUNCTION]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Verify error)
					Diagnosis delay time	7.5 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (ASIC error)
					Diagnosis delay time	1.3 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Incident radiation error)
					Diagnosis delay time	1.2 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B1249	12	Center FL distance sen has malf (The center left front distance sensor has a malfunction)	[CIRC SHORT TO BATTERY]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sonar sensor signal
				Threshold		Short circuit to power supply.
				Diagnosis delay time		2.0 seconds or more
B1249	14	Center FL distance sen has malf (The center left front distance sensor has a malfunction)	[CIRC SHORT TO GROUND OR OPEN]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Short circuit to ground
					Diagnosis delay time	2.0 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Open circuit
					Diagnosis delay time	2.0 seconds or more
B1249	23	Center FL distance sen has malf (The center left front distance sensor has a malfunction)	[SIGNAL STUCK LOW]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sensor ground signal
				Threshold		Open circuit
				Diagnosis delay time		2.0 seconds or more

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B1249	95	Center FL distance sen has malf (The center left front distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: 5 km/h (3.1 MPH) < Vehicle speed < 12 km/h (7.5 MPH) • Constant sensor distance value: 10 cm (3.9 in) < distance < 35 cm (13.8 in) **NOTE:** Vehicle speed and sensor distance must be present for at least 6 seconds • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	15 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: 5 km/h (3.1 MPH) < Vehicle speed < 12 km/h (7.5 MPH) • Constant sensor distance value: 10 cm (3.9 in) < distance < 35 cm (13.8 in) **NOTE:** Vehicle speed and sensor distance must be present for at least 6 seconds • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	15 seconds or more

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B1249	95	Center FL distance sen has malf (The center left front distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	1.5 seconds or more
				4	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	1.5 seconds or more

POSSIBLE CAUSE

09 [COMPONENT MALFUNCTION]
Internal error of the sonar corner sensor front LH

12 [CIRC SHORT TO BATTERY]
Short circuit of the sonar sensor signal to power supply circuit.
(Is detected by communication between sonar corner sensor front LH and sonar control unit)

14 [CIRC SHORT TO GROUND OR OPEN]
- Short circuit of the sonar sensor signal to ground
  (Is detected by communication between sonar corner sensor front LH and sonar control unit)
- Open circuit of the sonar sensor signal
  (Is detected by communication between sonar corner sensor front LH and sonar control unit)

23 [SIGNAL STUCK LOW]
Open circuit of the sonar sensor ground circuit
(Is detected by communication between sonar corner sensor front LH and sonar control unit)

95 [INCORRECT ASSEMBLY]
- Icing of the sonar corner sensor front LH
- Pollution of the sonar corner sensor front LH
- Improper installation of sonar corner sensor front LH

FAIL-SAFE

The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.

DTC CONFIRMATION PROCEDURE

B1249-09, B1249-12, B1249-14, B1249-23

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Turn ignition switch ON and wait at least 10 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “B1249-09”, “B1249-12”, “B1249-14” or “B1249-23” detected?

YES >> Proceed to SN-109, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

B1249-95

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Lift up drive wheel or vehicle.
2. Place an obstacle (e.g. tool box) near sonar corner sensor front LH [approximately 30 cm (11.8 in) from the sensor].
   NOTE:
   Be careful not to allow the obstacle to contact with the vehicle.
3. Start the engine.
4. Keep the vehicle speed at approximately 10 km/h (6.2 MPH) for at least 15 seconds.
5. Stop the vehicle.
6. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
7. Check DTC.

Is DTC “B1249-95” detected?

YES >> Proceed to SN-109, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611651

B1249-09

1.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor front LH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 2.

2.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1249-12

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and corner sensor front LH connector.
3. Turn ignition switch ON.
4. Check the voltage between sonar control unit harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Sonar control unit			
Connector	Terminal		
E1	36	Ground	0 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor front LH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and corner sensor front LH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-105, "DTC Description".

Is DTC “B1249-12” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1249-14

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and corner sensor front LH connector.
3. Check continuity between sonar control unit harness connector and corner sensor front LH harness connector.

Sonar control unit		Corner sensor front LH		Continuity
Connector	Terminal	Connector	Terminal	
E1	36	E128	2	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

Check continuity between sonar control unit harness connector and ground.

Terminals			Continuity
(+)		(–)	
Sonar control unit			
Connector	Terminal		
E1	36	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace harness or connector.

3.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor front LH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and corner sensor front LH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-105, "DTC Description".

Is DTC “B1249-14” detected as the current malfunction?

YES >> GO TO 5.
NO >> GO TO 6.

5.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 6.

6.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1249-23

1.CHECK SONAR SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and corner sensor front LH connector.
3. Check continuity between sonar control unit harness connector and corner sensor front LH harness connector.

Sonar control unit		Corner sensor front LH		Continuity
Connector	Terminal	Connector	Terminal	
E1	35	E128	3	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor front LH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and corner sensor front LH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-105, "DTC Description".

Is DTC “B1249-23” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1249-95

1.CHECK SONAR SENSOR POLLUTION

Check sonar sensor pollution.

Is the sonar sensor dirty?

YES >> GO TO 2.
NO >> GO TO 3.

2.CLEAN SONAR SENSOR

Clean sonar sensor.

>> GO TO 8.

3. CHECK SENSOR FOR TIGHT SEATING

Manually check sensor for tight seating.

Is the sonar sensor properly installed?

YES >> GO TO 4.
NO >> GO TO 5.

4. CHECK SENSOR INSTALLATION POSITION

Check whether the sonar sensor is seated in the center of the bumper opening.

Is the sonar sensor properly installed?

YES >> GO TO 6.
NO >> GO TO 5.

5. PROPERLY INSTALL SONAR SENSOR

Properly install sonar sensor.

>> GO TO 8.

6. CHECK SONAR SENSOR DAMAGED

Check whether the sonar sensor membrane has been damaged by stone chipping.

Does the sonar sensor have damage caused by stone chipping?

YES >> GO TO 7.
NO >> GO TO 8.

7. REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor front LH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 8.

8. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B124E CENTER SENSOR [FL]

DTC Description

INFOID:0000000013611652

DTC DETECTION LOGIC

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B124E	09	Inner FL distance sen has malf (The inner left front distance sensor has a malfunction)	[COMPONENT MALFUNCTION]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Verify error)
					Diagnosis delay time	7.5 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (ASIC error)
					Diagnosis delay time	1.3 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Incident radiation error)
					Diagnosis delay time	1.2 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B124E	12	Inner FL distance sen has malf (The inner left front distance sensor has a malfunction)	[CIRC SHORT TO BATTERY]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sonar sensor signal
				Threshold		Short circuit to power supply.
				Diagnosis delay time		2.0 seconds or more
B124E	14	Inner FL distance sen has malf (The inner left front distance sensor has a malfunction)	[CIRC SHORT TO GROUND OR OPEN]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Short circuit to ground
					Diagnosis delay time	2.0 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Open circuit
					Diagnosis delay time	2.0 seconds or more
B124E	23	Inner FL distance sen has malf (The inner left front distance sensor has a malfunction)	[SIGNAL STUCK LOW]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sensor ground signal
				Threshold		Open circuit
				Diagnosis delay time		2.0 seconds or more

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B124E	95	Inner FL distance sen has malf (The inner left front distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: 5 km/h (3.1 MPH) < Vehicle speed < 12 km/h (7.5 MPH) • Constant sensor distance value: 10 cm (3.9 in) < distance < 35 cm (13.8 in) **NOTE:** Vehicle speed and sensor distance must be present for at least 6 seconds • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	15 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: 5 km/h (3.1 MPH) < Vehicle speed < 12 km/h (7.5 MPH) • Constant sensor distance value: 10 cm (3.9 in) < distance < 35 cm (13.8 in) **NOTE:** Vehicle speed and sensor distance must be present for at least 6 seconds • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	15 seconds or more

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B124E	95	Inner FL distance sen has malf (The inner left front distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	1.5 seconds or more
				4	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	1.5 seconds or more

POSSIBLE CAUSE

09 [COMPONENT MALFUNCTION]
Internal error of the sonar center sensor front LH

12 [CIRC SHORT TO BATTERY]
Short circuit of the sonar sensor signal to power supply circuit.
(Is detected by communication between sonar center sensor front LH and sonar control unit)

14 [CIRC SHORT TO GROUND OR OPEN]
- Short circuit of the sonar sensor signal to ground
  (Is detected by communication between sonar center sensor front LH and sonar control unit)
- Open circuit of the sonar sensor signal
  (Is detected by communication between sonar center sensor front LH and sonar control unit)

23 [SIGNAL STUCK LOW]
Open circuit of the sonar sensor ground circuit
(Is detected by communication between sonar center sensor front LH and sonar control unit)

95 [INCORRECT ASSEMBLY]
- Icing of the sonar center sensor front LH
- Pollution of the sonar center sensor front LH
- Improper installation of sonar center sensor front LH

FAIL-SAFE

The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.

DTC CONFIRMATION PROCEDURE

B124E-09, B124E-12, B124E-14, B124E-23

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Turn ignition switch ON and wait at least 10 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “B124E-09”, “B124E-12”, “B124E-14” or “B124E-23” detected?

YES >> Proceed to SN-118, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

B124E-95

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Lift up drive wheel or vehicle.
2. Place an obstacle (e.g. tool box) near sonar center sensor front LH [approximately 30 cm (11.8 in) from the sensor].
   NOTE:
   Be careful not to allow the obstacle to contact with the vehicle.
3. Start the engine.
4. Keep the vehicle speed at approximately 10 km/h (6.2 MPH) for at least 15 seconds.
5. Stop the vehicle.
6. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
7. Check DTC.

Is DTC “B124E-95” detected?

YES >> Proceed to SN-118, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611653

B124E-09

1.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor front LH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 2.

2.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B124E-12

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and center sensor front LH connector.
3. Turn ignition switch ON.
4. Check the voltage between sonar control unit harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Sonar control unit			
Connector	Terminal		
E1	31	Ground	0 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor front LH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and center sensor front LH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-114, "DTC Description".

Is DTC “B124E-12” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B124E-14

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and center sensor front LH connector.
3. Check continuity between sonar control unit harness connector and center sensor front LH harness connector.

Sonar control unit		Center sensor front LH		Continuity
Connector	Terminal	Connector	Terminal	
E1	31	E127	2	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

Check continuity between sonar control unit harness connector and ground.

Terminals			Continuity
(+)		(−)	
Sonar control unit			
Connector	Terminal		
E1	31	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace harness or connector.

3.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor front LH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and center sensor front LH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-114, "DTC Description".

Is DTC “B124E-14” detected as the current malfunction?

YES >> GO TO 5.
NO >> GO TO 6.

5.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 6.

6.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B124E-23

1.CHECK SONAR SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and center sensor front LH connector.
3. Check continuity between sonar control unit harness connector and center sensor front LH harness connector.

Sonar control unit		Center sensor front LH		Continuity
Connector	Terminal	Connector	Terminal	
E1	35	E127	3	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor front LH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and center sensor front LH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-114, "DTC Description".

Is DTC “B124E-23” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B124E-95

1.CHECK SONAR SENSOR POLLUTION

Check sonar sensor pollution.

Is the sonar sensor dirty?

YES >> GO TO 2.
NO >> GO TO 3.

2.CLEAN SONAR SENSOR

Clean sonar sensor.

>> GO TO 8.

3. CHECK SENSOR FOR TIGHT SEATING

Manually check sensor for tight seating.

Is the sonar sensor properly installed?

YES >> GO TO 4.
NO >> GO TO 5.

4. CHECK SENSOR INSTALLATION POSITION

Check whether the sonar sensor is seated in the center of the bumper opening.

Is the sonar sensor properly installed?

YES >> GO TO 6.
NO >> GO TO 5.

5.PROPERLY INSTALL SONAR SENSOR

Properly install sonar sensor.

>> GO TO 8.

6. CHECK SONAR SENSOR DAMAGED

Check whether the sonar sensor membrane has been damaged by stone chipping.

Does the sonar sensor have damage caused by stone chipping?

YES >> GO TO 7.
NO >> GO TO 8.

7.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor front LH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 8.

8.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1253 CENTER SENSOR [FR]

DTC Description

INFOID:0000000013611654

DTC DETECTION LOGIC

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B1253	09	Inner FR distance sen has malf (The inner right front distance sensor has a malfunction)	[COMPONENT MALFUNCTION]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Verify error)
					Diagnosis delay time	7.5 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (ASIC error)
					Diagnosis delay time	1.3 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Incident radiation error)
					Diagnosis delay time	1.2 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B1253	12	Inner FR distance sen has malf (The inner right front distance sensor has a malfunction)	[CIRC SHORT TO BATTERY]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sonar sensor signal
				Threshold		Short circuit to power supply.
				Diagnosis delay time		2.0 seconds or more
B1253	14	Inner FR distance sen has malf (The inner right front distance sensor has a malfunction)	[CIRC SHORT TO GROUND OR OPEN]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Short circuit to ground
					Diagnosis delay time	2.0 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Open circuit
					Diagnosis delay time	2.0 seconds or more
B1253	23	Inner FR distance sen has malf (The inner right front distance sensor has a malfunction)	[SIGNAL STUCK LOW]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sensor ground signal
				Threshold		Open circuit
				Diagnosis delay time		2.0 seconds or more

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B1253	95	Inner FR distance sen has malf (The inner right front distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: 5 km/h (3.1 MPH) < Vehicle speed < 12 km/h (7.5 MPH) • Constant sensor distance value: 10 cm (3.9 in) < distance < 35 cm (13.8 in) **NOTE:** Vehicle speed and sensor distance must be present for at least 6 seconds • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	15 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: 5 km/h (3.1 MPH) < Vehicle speed < 12 km/h (7.5 MPH) • Constant sensor distance value: 10 cm (3.9 in) < distance < 35 cm (13.8 in) **NOTE:** Vehicle speed and sensor distance must be present for at least 6 seconds • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	15 seconds or more

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B1253	95	Inner FR distance sen has malf (The inner right front distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	1.5 seconds or more
				4	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	1.5 seconds or more

POSSIBLE CAUSE

09 [COMPONENT MALFUNCTION]
Internal error of the sonar center sensor front RH

12 [CIRC SHORT TO BATTERY]
Short circuit of the sonar sensor signal to power supply circuit.
(Is detected by communication between sonar center sensor front RH and sonar control unit)

14 [CIRC SHORT TO GROUND OR OPEN]
- Short circuit of the sonar sensor signal to ground
  (Is detected by communication between sonar center sensor front RH and sonar control unit)
- Open circuit of the sonar sensor signal
  (Is detected by communication between sonar center sensor front RH and sonar control unit)

23 [SIGNAL STUCK LOW]
Open circuit of the sonar sensor ground circuit
(Is detected by communication between sonar center sensor front RH and sonar control unit)

95 [INCORRECT ASSEMBLY]
- Icing of the sonar center sensor front RH
- Pollution of the sonar center sensor front RH
- Improper installation of sonar center sensor front RH

FAIL-SAFE

The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.

DTC CONFIRMATION PROCEDURE

B1253-09, B1253-12, B1253-14, B1253-23

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Turn ignition switch ON and wait at least 10 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “B1253-09”, “B1253-12”, “B1253-14” or “B1253-23” detected?

YES >> Proceed to SN-127, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

B1253-95

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Lift up drive wheel or vehicle.
2. Place an obstacle (e.g. tool box) near sonar center sensor front RH [approximately 30 cm (11.8 in) from the sensor].
   NOTE:
   Be careful not to allow the obstacle to contact with the vehicle.
3. Start the engine.
4. Keep the vehicle speed at approximately 10 km/h (6.2 MPH) for at least 15 seconds.
5. Stop the vehicle.
6. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
7. Check DTC.

Is DTC “B1253-95” detected?

YES >> Proceed to SN-127, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611655

B1253-09

1.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor front RH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 2.

2.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1253-12

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and center sensor front RH connector.
3. Turn ignition switch ON.
4. Check the voltage between sonar control unit harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Sonar control unit			
Connector	Terminal		
E1	37	Ground	0 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor front RH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and center sensor front RH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-123, "DTC Description".

Is DTC “B1253-12” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1253-14

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and center sensor front RH connector.
3. Check continuity between sonar control unit harness connector and center sensor front RH harness connector.

Sonar control unit		Center sensor front RH		Continuity
Connector	Terminal	Connector	Terminal	
E1	37	E130	2	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

Check continuity between sonar control unit harness connector and ground.

Terminals			Continuity
(+)		(–)	
Sonar control unit			
Connector	Terminal		
E1	37	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace harness or connector.

3.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor front RH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and center sensor front RH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-123, "DTC Description".

Is DTC “B1253-14” detected as the current malfunction?

YES >> GO TO 5.
NO >> GO TO 6.

5.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 6.

6.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1253-23

1.CHECK SONAR SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and center sensor front RH connector.
3. Check continuity between sonar control unit harness connector and center sensor front RH harness connector.

Sonar control unit		Center sensor front RH		Continuity
Connector	Terminal	Connector	Terminal	
E1	35	E130	3	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor front RH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and center sensor front RH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-123, "DTC Description".

Is DTC “B1253-23” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1253-95

1.CHECK SONAR SENSOR POLLUTION

Check sonar sensor pollution.

Is the sonar sensor dirty?

YES >> GO TO 2.
NO >> GO TO 3.

2.CLEAN SONAR SENSOR

Clean sonar sensor.

>> GO TO 8.

3. CHECK SENSOR FOR TIGHT SEATING

Manually check sensor for tight seating.

Is the sonar sensor properly installed?

YES >> GO TO 4.
NO >> GO TO 5.

4. CHECK SENSOR INSTALLATION POSITION

Check whether the sonar sensor is seated in the center of the bumper opening.

Is the sonar sensor properly installed?

YES >> GO TO 6.
NO >> GO TO 5.

5. PROPERLY INSTALL SONAR SENSOR

Properly install sonar sensor.

>> GO TO 8.

6. CHECK SONAR SENSOR DAMAGED

Check whether the sonar sensor membrane has been damaged by stone chipping.

Does the sonar sensor have damage caused by stone chipping?

YES >> GO TO 7.
NO >> GO TO 8.

7. REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the center sensor front RH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 8.

8. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1258 CORNER SENSOR [FR]

DTC Description

INFOID:0000000013611656

DTC DETECTION LOGIC

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B1258	09	Center FR distance sen has malf (The center right front distance sensor has a malfunction)	[COMPONENT MALFUNCTION]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Verify error)
					Diagnosis delay time	7.5 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (ASIC error)
					Diagnosis delay time	1.3 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Incident radiation error)
					Diagnosis delay time	1.2 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B1258	12	Center FR distance sen has malf (The center right front distance sensor has a malfunction)	[CIRC SHORT TO BATTERY]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sonar sensor signal
				Threshold		Short circuit to power supply.
				Diagnosis delay time		2.0 seconds or more
B1258	14	Center FR distance sen has malf (The center right front distance sensor has a malfunction)	[CIRC SHORT TO GROUND OR OPEN]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Short circuit to ground
					Diagnosis delay time	2.0 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Open circuit
					Diagnosis delay time	2.0 seconds or more
B1258	23	Center FR distance sen has malf (The center right front distance sensor has a malfunction)	[SIGNAL STUCK LOW]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sensor ground signal
				Threshold		Open circuit
				Diagnosis delay time		2.0 seconds or more

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B1258	95	Center FR distance sen has malf (The center right front distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: 5 km/h (3.1 MPH) < Vehicle speed < 12 km/h (7.5 MPH) • Constant sensor distance value: 10 cm (3.9 in) < distance < 35 cm (13.8 in) **NOTE:** Vehicle speed and sensor distance must be present for at least 6 seconds • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	15 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: 5 km/h (3.1 MPH) < Vehicle speed < 12 km/h (7.5 MPH) • Constant sensor distance value: 10 cm (3.9 in) < distance < 35 cm (13.8 in) **NOTE:** Vehicle speed and sensor distance must be present for at least 6 seconds • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	15 seconds or more

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B1258	95	Center FR distance sen has malf (The center right front distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	1.5 seconds or more
				4	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	1.5 seconds or more

POSSIBLE CAUSE

09 [COMPONENT MALFUNCTION]
Internal error of the sonar corner sensor front RH

12 [CIRC SHORT TO BATTERY]
Short circuit of the sonar sensor signal to power supply circuit.
(Is detected by communication between sonar corner sensor front RH and sonar control unit)

14 [CIRC SHORT TO GROUND OR OPEN]
- Short circuit of the sonar sensor signal to ground
  (Is detected by communication between sonar corner sensor front RH and sonar control unit)
- Open circuit of the sonar sensor signal
  (Is detected by communication between sonar corner sensor front RH and sonar control unit)

23 [SIGNAL STUCK LOW]
Open circuit of the sonar sensor ground circuit
(Is detected by communication between sonar corner sensor front RH and sonar control unit)

95 [INCORRECT ASSEMBLY]
- Icing of the sonar corner sensor front RH
- Pollution of the sonar corner sensor front RH
- Improper installation of sonar corner sensor front RH

FAIL-SAFE

The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.

DTC CONFIRMATION PROCEDURE

B1258-09, B1258-12, B1258-14, B1258-23

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Turn ignition switch ON and wait at least 10 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “B1258-09” “B1258-12”, “B1258-14” or “B1258-23” detected?

YES >> Proceed to SN-136, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

B1258-95

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Lift up drive wheel or vehicle.
2. Place an obstacle (e.g. tool box) near sonar corner sensor front RH [approximately 30 cm (11.8 in) from the sensor].
   NOTE:
   Be careful not to allow the obstacle to contact with the vehicle.
3. Start the engine.
4. Keep the vehicle speed at approximately 10 km/h (6.2 MPH) for at least 15 seconds.
5. Stop the vehicle.
6. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
7. Check DTC.

Is DTC “B1258-95” detected?

YES >> Proceed to SN-136, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611657

B1258-09

1.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor front RH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 2.

2.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1258-12

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and corner sensor front RH connector.
3. Turn ignition switch ON.
4. Check the voltage between sonar control unit harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Sonar control unit			
Connector	Terminal		
E1	32	Ground	0 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor front RH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and corner sensor front RH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-132, "DTC Description".

Is DTC “B1258-12” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1258-14

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and corner sensor front RH connector.
3. Check continuity between sonar control unit harness connector and corner sensor front RH harness connector.

Sonar control unit		Corner sensor front RH		Continuity
Connector	Terminal	Connector	Terminal	
E1	32	E131	2	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

Check continuity between sonar control unit harness connector and ground.

Terminals			Continuity
(+)		(−)	
Sonar control unit			
Connector	Terminal		
E1	32	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace harness or connector.

3.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor front RH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and corner sensor front RH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-132, "DTC Description".

Is DTC “B1258-14” detected as the current malfunction?

YES >> GO TO 5.
NO >> GO TO 6.

5.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 6.

6.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1258-23

1.CHECK SONAR SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and corner sensor front RH connector.
3. Check continuity between sonar control unit harness connector and corner sensor front RH harness connector.

Sonar control unit		Corner sensor front RH		Continuity
Connector	Terminal	Connector	Terminal	
E1	35	E131	3	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor front RH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and corner sensor front RH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-132, "DTC Description".

Is DTC “B1258-23” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1258-95

1.CHECK SONAR SENSOR POLLUTION

Check sonar sensor pollution.

Is the sonar sensor dirty?

YES >> GO TO 2.
NO >> GO TO 3.

2.CLEAN SONAR SENSOR

Clean sonar sensor.

>> GO TO 8.

3. CHECK SENSOR FOR TIGHT SEATING

Manually check sensor for tight seating.

Is the sonar sensor properly installed?

YES >> GO TO 4.
NO >> GO TO 5.

4. CHECK SENSOR INSTALLATION POSITION

Check whether the sonar sensor is seated in the center of the bumper opening.

Is the sonar sensor properly installed?

YES >> GO TO 6.
NO >> GO TO 5.

5. PROPERLY INSTALL SONAR SENSOR

Properly install sonar sensor.

>> GO TO 8.

6. CHECK SONAR SENSOR DAMAGED

Check whether the sonar sensor membrane has been damaged by stone chipping.

Does the sonar sensor have damage caused by stone chipping?

YES >> GO TO 7.
NO >> GO TO 8.

7. REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor front RH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 8.

8. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B125D SIDE SENSOR [FR]

DTC Description

INFOID:0000000013611658

DTC DETECTION LOGIC

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B125D	09	Outer FR distance sen has malf (The outer right front distance sensor has a malfunction)	[COMPONENT MALFUNCTION]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Verify error)
					Diagnosis delay time	7.5 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (ASIC error)
					Diagnosis delay time	1.3 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Incident radiation error)
					Diagnosis delay time	1.2 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B125D	12	Outer FR distance sen has malf (The outer right front distance sensor has a malfunction)	[CIRC SHORT TO BATTERY]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sonar sensor signal
				Threshold		Short circuit to power supply
				Diagnosis delay time		2.0 seconds or more
B125D	14	Outer FR distance sen has malf (The outer right front distance sensor has a malfunction)	[CIRC SHORT TO GROUND OR OPEN]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Short circuit to ground
					Diagnosis delay time	2.0 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Open circuit
					Diagnosis delay time	2.0 seconds or more
B125D	23	Outer FR distance sen has malf (The outer right front distance sensor has a malfunction)	[SIGNAL STUCK LOW]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sensor ground signal
				Threshold		Open circuit
				Diagnosis delay time		2.0 seconds or more

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B125D	95	Outer FR distance sen has malf (The outer right front distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	1.5 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	1.5 seconds or more

POSSIBLE CAUSE

09 [COMPONENT MALFUNCTION]
Internal error of the sonar side sensor front RH

12 [CIRC SHORT TO BATTERY]
Short circuit of the sonar sensor signal to power supply circuit.
(Is detected by communication between sonar side sensor front RH and sonar control unit)

14 [CIRC SHORT TO GROUND OR OPEN]
- Short circuit of the sonar sensor signal to ground
  (Is detected by communication between sonar side sensor front RH and sonar control unit)
- Open circuit of the sonar sensor signal
  (Is detected by communication between sonar side sensor front RH and sonar control unit)

23 [SIGNAL STUCK LOW]
Open circuit of the sonar sensor ground circuit
(Is detected by communication between sonar side sensor front RH and sonar control unit)

95 [INCORRECT ASSEMBLY]
- Icing of the sonar side sensor front RH
- Pollution of the sonar side sensor front RH
- Improper installation of sonar side sensor front RH

FAIL-SAFE

The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Turn ignition switch ON and wait at least 10 seconds or more.

2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “B125D-09”, “B125D-12”, “B125D-14”, “B125D-23” or “B125D-95” detected?

YES >> Proceed to SN-144, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611659

B125D-09

1.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor front RH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 2.

2.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B125D-12

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and side sensor front RH connector.
3. Turn ignition switch ON.
4. Check the voltage between sonar control unit harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Sonar control unit			
Connector	Terminal		
E1	38	Ground	0 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor front RH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and side sensor front RH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-141, "DTC Description".

Is DTC “B125D-12” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4. REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B125D-14

1. CHECK SONAR SENSOR SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and side sensor front RH connector.
3. Check continuity between sonar control unit harness connector and side sensor front RH harness connector.

Sonar control unit		Side sensor front RH		Continuity
Connector	Terminal	Connector	Terminal	
E1	38	E129	2	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2. CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

Check continuity between sonar control unit harness connector and ground.

Terminals			Continuity
(+)		(–)	
Sonar control unit			
Connector	Terminal		
E129	38	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace harness or connector.

3. REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor front RH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 4.

4. PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and side sensor front RH connector.
2. Turn ignition switch ON.

3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-141, "DTC Description".

Is DTC “B125D-14” detected as the current malfunction?

YES >> GO TO 5.
NO >> GO TO 6.

5.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 6.

6.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B125D-23

1.CHECK SONAR SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and side sensor front RH connector.
3. Check continuity between sonar control unit harness connector and side sensor front RH harness connector.

Sonar control unit		Side sensor front RH		Continuity
Connector	Terminal	Connector	Terminal	
E1	35	E129	3	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor front RH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and side sensor front RH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-141, "DTC Description".

Is DTC “B125D-23” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B125D-95

1.CHECK SONAR SENSOR POLLUTION

Check sonar sensor pollution.

Is the sonar sensor dirty?

YES >> GO TO 2.
NO >> GO TO 3.

2.CLEAN SONAR SENSOR

Clean sonar sensor.

>> GO TO 8.

3. CHECK SENSOR FOR TIGHT SEATING

Manually check sensor for tight seating.

Is the sonar sensor properly installed?

YES >> GO TO 4.
NO >> GO TO 5.

4. CHECK SENSOR INSTALLATION POSITION

Check whether the sonar sensor is seated in the center of the bumper opening.

Is the sonar sensor properly installed?

YES >> GO TO 6.
NO >> GO TO 5.

5.PROPERLY INSTALL SONAR SENSOR

Properly install sonar sensor.

>> GO TO 8.

6. CHECK SONAR SENSOR DAMAGED

Check whether the sonar sensor membrane has been damaged by stone chipping.

Does the sonar sensor have damage caused by stone chipping?

YES >> GO TO 7.
NO >> GO TO 8.

7.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor front RH. Refer to SN-202, "FRONT : Removal and Installation".

>> GO TO 8.

8.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.

3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B127B CORNER SENSOR [RL]

DTC Description

INFOID:0000000013611660

DTC DETECTION LOGIC

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B127B	09	Center RL distance sen has malf (The center left rear distance sensor has a malfunction)	[COMPONENT MALFUNCTION]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Verify error)
					Diagnosis delay time	7.5 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (ASIC error)
					Diagnosis delay time	1.3 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Incident radiation error)
					Diagnosis delay time	1.2 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B127B	12	Center RL distance sen has malf (The center left rear distance sensor has a malfunction)	[CIRC SHORT TO BATTERY]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sonar sensor signal
				Threshold		Short circuit to power supply.
				Diagnosis delay time		2.0 seconds or more
B127B	14	Center RL distance sen has malf (The center left rear distance sensor has a malfunction)	[CIRC SHORT TO GROUND OR OPEN]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Short circuit to ground
					Diagnosis delay time	2.0 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Open circuit
					Diagnosis delay time	2.0 seconds or more
B127B	23	Center RL distance sen has malf (The center left rear distance sensor has a malfunction)	[SIGNAL STUCK LOW]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sensor ground signal
				Threshold		Open circuit
				Diagnosis delay time		2.0 seconds or more

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B127B	95	Center RL distance sen has malf (The center left rear distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: 5 km/h (3.1 MPH) < Vehicle speed < 12 km/h (7.5 MPH) • Constant sensor distance value: 10 cm (3.9 in) < distance < 35 cm (13.8 in) **NOTE:** Vehicle speed and sensor distance must be present for at least 6 seconds • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	15 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: 5 km/h (3.1 MPH) < Vehicle speed < 12 km/h (7.5 MPH) • Constant sensor distance value: 10 cm (3.9 in) < distance < 35 cm (13.8 in) **NOTE:** Vehicle speed and sensor distance must be present for at least 6 seconds • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	15 seconds or more

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B127B	95	Center RL distance sen has malf (The center left rear distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	1.5 seconds or more
				4	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	1.5 seconds or more

POSSIBLE CAUSE

09 [COMPONENT MALFUNCTION]
Internal error of the sonar corner sensor rear LH

12 [CIRC SHORT TO BATTERY]
Short circuit of the sonar sensor signal to power supply circuit.
(Is detected by communication between sonar corner sensor rear LH and sonar control unit)

14 [CIRC SHORT TO GROUND OR OPEN]
- Short circuit of the sonar sensor signal to ground
  (Is detected by communication between sonar corner sensor rear LH and sonar control unit)
- Open circuit of the sonar sensor signal
  (Is detected by communication between sonar corner sensor rear LH and sonar control unit)

23 [SIGNAL STUCK LOW]
Open circuit of the sonar sensor ground circuit
(Is detected by communication between sonar corner sensor rear LH and sonar control unit)

95 [INCORRECT ASSEMBLY]
- Icing of the sonar corner sensor rear LH
- Pollution of the sonar corner sensor rear LH
- Improper installation of sonar corner sensor rear LH

FAIL-SAFE

The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.

DTC CONFIRMATION PROCEDURE

B127B-09, B127B-12, B127B-14, B127B-23

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Turn ignition switch ON and wait at least 10 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “B127B-09”, “B127B-12”, “B127B-14” or “B127B-23” detected?

YES >> Proceed to SN-153, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

B127B-95

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Lift up drive wheel or vehicle.
2. Place an obstacle (e.g. tool box) near sonar corner sensor rear LH [approximately 30 cm (11.8 in) from the sensor].
   NOTE:
   Be careful not to allow the obstacle to contact with the vehicle.
3. Start the engine.
4. Keep the vehicle speed at approximately 10 km/h (6.2 MPH) for at least 15 seconds.
5. Stop the vehicle.
6. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
7. Check DTC.

Is DTC “B127B-95” detected?

YES >> Proceed to SN-153, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611661

B127B-09

1.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor rear LH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 2.

2.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B127B-12

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and corner sensor rear LH connector.
3. Turn ignition switch ON.
4. Check the voltage between sonar control unit harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Sonar control unit			
Connector	Terminal		
M4	6	Ground	0 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor rear LH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and corner sensor rear LH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-149, "DTC Description".

Is DTC “B127B-12” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B127B-14

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and corner sensor rear LH connector.
3. Check continuity between sonar control unit harness connector and corner sensor rear LH harness connector.

Sonar control unit		Corner sensor rear LH		Continuity
Connector	Terminal	Connector	Terminal	
M4	6	M257	2	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

Check continuity between sonar control unit harness connector and ground.

Terminals			Continuity
(+)		(–)	
Sonar control unit			
Connector	Terminal		
M4	6	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace harness or connector.

3.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor rear LH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and corner sensor rear LH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-149, "DTC Description".

Is DTC “B127B-14” detected as the current malfunction?

YES >> GO TO 5.
NO >> GO TO 6.

5.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 6.

6.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B127B-23

1.CHECK SONAR SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and corner sensor rear LH connector.
3. Check continuity between sonar control unit harness connector and corner sensor rear LH harness connector.

Sonar control unit		Corner sensor rear LH		Continuity
Connector	Terminal	Connector	Terminal	
M4	23	M257	3	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor rear LH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and corner sensor rear LH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-149, "DTC Description".

Is DTC “B127B-23” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B127B-95

1.CHECK SONAR SENSOR POLLUTION

Check sonar sensor pollution.

Is the sonar sensor dirty?

YES >> GO TO 2.
NO >> GO TO 3.

2.CLEAN SONAR SENSOR

Clean sonar sensor.

>> GO TO 8.

3. CHECK SENSOR FOR TIGHT SEATING

Manually check sensor for tight seating.

Is the sonar sensor properly installed?

YES >> GO TO 4.
NO >> GO TO 5.

4. CHECK SENSOR INSTALLATION POSITION

Check whether the sonar sensor is seated in the center of the bumper opening.

Is the sonar sensor properly installed?

YES >> GO TO 6.
NO >> GO TO 5.

5. PROPERLY INSTALL SONAR SENSOR

Properly install sonar sensor.

>> GO TO 8.

6. CHECK SONAR SENSOR DAMAGED

Check whether the sonar sensor membrane has been damaged by stone chipping.

Does the sonar sensor have damage caused by stone chipping?

YES >> GO TO 7.
NO >> GO TO 8.

7. REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the corner sensor rear LH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 8.

8. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1280 SIDE SENSOR [RL]

DTC Description

INFOID:0000000013611662

DTC DETECTION LOGIC

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B1280	09	Outer RL distance sen has malf (The outer left rear distance sensor has a malfunction)	[COMPONENT MALFUNCTION]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Verify error)
					Diagnosis delay time	7.5 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (ASIC error)
					Diagnosis delay time	1.3 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)
				3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 12 km/h (7.5 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	—
					Threshold	Internal error of the sensor (Incident radiation error)
					Diagnosis delay time	1.2 seconds or more **NOTE:** The detection time is with all sensors equal if the speed is = 0 km/h (0 MPH)

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B1280	12	Outer RL distance sen has malf (The outer left rear distance sensor has a malfunction)	[CIRC SHORT TO BATTERY]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sonar sensor signal
				Threshold		Short circuit to power supply
				Diagnosis delay time		2.0 seconds or more
B1280	14	Outer RL distance sen has malf (The outer left rear distance sensor has a malfunction)	[CIRC SHORT TO GROUND OR OPEN]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Short circuit to ground
					Diagnosis delay time	2.0 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Sonar sensor signal
					Threshold	Open circuit
					Diagnosis delay time	2.0 seconds or more
B1280	23	Outer RL distance sen has malf (The outer left rear distance sensor has a malfunction)	[SIGNAL STUCK LOW]	Diagnosis condition		When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 18 km/h (11.2 MPH) • Sonar control unit power supply voltage: 8.5 V < voltage < 16.5 V
				Signal (terminal)		Sensor ground signal
				Threshold		Open circuit
				Diagnosis delay time		2.0 seconds or more

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition		
B1280	95	Outer RL distance sen has malf (The outer left rear distance sensor has a malfunction)	[INCORRECT ASSEMBLY]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Pollution of sensor
					Diagnosis delay time	1.5 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V **NOTE:** Decrease of the decay time to 640 μs to 752 μs (e.g. if an air layer is between the membrane and ice)
					Signal (terminal)	—
					Threshold	Improper installation of sensor
					Diagnosis delay time	1.5 seconds or more

POSSIBLE CAUSE

09 [COMPONENT MALFUNCTION]
Internal error of the sonar side sensor rear LH

12 [CIRC SHORT TO BATTERY]
Short circuit of the sonar sensor signal to power supply circuit.
(Is detected by communication between sonar side sensor rear LH and sonar control unit)

14 [CIRC SHORT TO GROUND OR OPEN]
- Short circuit of the sonar sensor signal to ground
  (Is detected by communication between sonar side sensor rear LH and sonar control unit)
- Open circuit of the sonar sensor signal
  (Is detected by communication between sonar side sensor rear LH and sonar control unit)

23 [SIGNAL STUCK LOW]
Open circuit of the sonar sensor ground circuit
(Is detected by communication between sonar side sensor rear LH and sonar control unit)

95 [INCORRECT ASSEMBLY]
- Icing of the sonar side sensor rear LH
- Pollution of the sonar side sensor rear LH
- Improper installation of sonar side sensor rear LH

FAIL-SAFE

The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Turn ignition switch ON and wait at least 10 seconds or more.

2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “B1280-09”, “B1280-12”, “B1280-14”, “B1280-23” or “B1280-95” detected?

YES >> Proceed to SN-161, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611663

B1280-09

1.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor rear LH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 2.

2.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1280-12

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and side sensor rear LH connector.
3. Turn ignition switch ON.
4. Check the voltage between sonar control unit harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Sonar control unit			
Connector	Terminal		
M4	20	Ground	0 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor rear LH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and side sensor rear LH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-158, "DTC Description".

Is DTC “B1280-12” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1280-14

1.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and side sensor rear LH connector.
3. Check continuity between sonar control unit harness connector and side sensor rear LH harness connector.

Sonar control unit		Side sensor rear LH		Continuity
Connector	Terminal	Connector	Terminal	
M4	20	M255	2	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR SHORT

Check continuity between sonar control unit harness connector and ground.

Terminals			Continuity
(+)		(−)	
Sonar control unit			
Connector	Terminal		
M4	20	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace harness or connector.

3.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor rear LH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and side sensor rear LH connector.
2. Turn ignition switch ON.

3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-158, "DTC Description".

Is DTC “B1280-14” detected as the current malfunction?

YES >> GO TO 5.
NO >> GO TO 6.

5.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 6.

6.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1280-23

1.CHECK SONAR SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and side sensor rear LH connector.
3. Check continuity between sonar control unit harness connector and side sensor rear LH harness connector.

Sonar control unit		Side sensor rear LH		Continuity
Connector	Terminal	Connector	Terminal	
M4	23	M255	3	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace harness or connector.

2.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor rear LH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and side sensor rear LH connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-158, "DTC Description".

Is DTC “B1280-23” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1280-95

1.CHECK SONAR SENSOR POLLUTION

Check sonar sensor pollution.

Is the sonar sensor dirty?

YES >> GO TO 2.
NO >> GO TO 3.

2.CLEAN SONAR SENSOR

Clean sonar sensor.

>> GO TO 8.

3. CHECK SENSOR FOR TIGHT SEATING

Manually check sensor for tight seating.

Is the sonar sensor properly installed?

YES >> GO TO 4.
NO >> GO TO 5.

4. CHECK SENSOR INSTALLATION POSITION

Check whether the sonar sensor is seated in the center of the bumper opening.

Is the sonar sensor properly installed?

YES >> GO TO 6.
NO >> GO TO 5.

5.PROPERLY INSTALL SONAR SENSOR

Properly install sonar sensor.

>> GO TO 8.

6. CHECK SONAR SENSOR DAMAGED

Check whether the sonar sensor membrane has been damaged by stone chipping.

Does the sonar sensor have damage caused by stone chipping?

YES >> GO TO 7.
NO >> GO TO 8.

7.REPLACE SONAR SENSOR

1. Turn ignition switch OFF.
2. Replace the side sensor rear LH. Refer to SN-205, "REAR : Removal and Installation".

>> GO TO 8.

8.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.

3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1285 SENSOR POWER SUPPLY AND GROUND CIRCUIT

DTC Description

INFOID:0000000013611664

DTC DETECTION LOGIC

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B1285	1C	Fr distance sens have malf (The front distance sensors have a malfunction)	[CIRC VOLTAGE OUT OF RANGE]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Front sonar sensor power supply signal
					Threshold	Under voltage of the front sensor power supply voltage
					Diagnosis delay time	1.5 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Front sonar sensor power supply signal
					Threshold	Over voltage of the front sensor power supply voltage
					Diagnosis delay time	1.5 seconds or more
				3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Front sonar sensor power supply signal
					Threshold	Short circuit of the front sensor power supply voltage to ground
					Diagnosis delay time	1.5 seconds or more

POSSIBLE CAUSE

1C [CIRC VOLTAGE OUT OF RANGE]
- Under voltage of the front sensor power supply voltage.
- Over voltage of the front sensor power supply voltage.
- Short circuit of the front sensor power supply voltage to ground.

FAIL-SAFE

The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Turn ignition switch ON and wait at least 2 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “B1285-1C” detected?

YES >> Proceed to SN-167, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611665

B1285-1C

1.CHECK BATTERY

Check battery condition.

Is the inspection result normal?

YES >> GO TO 2.
NO >> GO TO 3.

2.CHECK CHARGING SYSTEM

Check charging system condition.

Is the inspection result normal?

YES >> GO TO 4.
NO >> GO TO 3.

3.REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the malfunctioning parts.

>> GO TO 9.

4.CHECK SONAR SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check the voltage between sonar control unit harness connector and ground.

Probe			Standard	Voltage (Approx.)
(+)		(-)		
Sonar control unit				
Connector	Terminal			
E1	39	Ground	11.0 V – 15.5 V	12.5 V

Is the inspection result normal?

YES >> GO TO 7.
NO >> GO TO 5.

5.CHECK SONAR SENSOR POWER SUPPLY CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and all front sonar sensors connector.
3. Turn ignition switch ON.
4. Check the voltage between sonar control unit harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Sonar control unit			
Connector	Terminal		
E1	39	Ground	0 V

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace harness or connector.

6.CHECK SONAR SENSOR SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Check continuity between sonar control unit harness connector and ground.

Terminals			Continuity
(+)		(–)	
Sonar control unit			
Connector	Terminal		
E1	39	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 7.
NO >> Repair or replace harness or connector.

7.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and all front sonar sensors connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-166, "DTC Description".

Is DTC “B1285-1C” detected as the current malfunction?

YES >> GO TO 8.
NO >> GO TO 9.

8.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 9.

9.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B1286 SENSOR POWER SUPPLY AND GROUND CIRCUIT

DTC Description

INFOID:0000000013611666

DTC DETECTION LOGIC

DTC		CONSULT screen terms		DTC detection condition		
		(Trouble diagnosis content)	[Malfunction type]			
B1286	1C	Rr distance sens have malf (The rear distance sensors have a malfunction)	[CIRC VOLTAGE OUT OF RANGE]	1	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Rear sonar sensor power supply signal
					Threshold	Under voltage of the rear sensor power supply voltage.
					Diagnosis delay time	1.5 seconds or more
				2	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Rear sonar sensor power supply signal
					Threshold	Over voltage of the rear sensor power supply voltage.
					Diagnosis delay time	1.5 seconds or more
				3	Diagnosis condition	When the following conditions are satisfied • Ignition switch: ON • Vehicle speed: < 41 km/h (25.5 MPH) • Sonar sensor power supply voltage: 8.5 V < voltage < 16.5 V
					Signal (terminal)	Rear sonar sensor power supply signal
					Threshold	Short circuit of the rear sensor power supply voltage to ground.
					Diagnosis delay time	1.5 seconds or more

POSSIBLE CAUSE

1C [CIRC VOLTAGE OUT OF RANGE]
- Under voltage of the rear sonar sensor power supply voltage.
- Over voltage of the rear sonar sensor power supply voltage.
- Short circuit of the rear sonar sensor power supply voltage to ground.

FAIL-SAFE

The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Turn ignition switch ON and wait at least 2 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “B1286-1C” detected?

YES >> Proceed to SN-170, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611667

B1286-1C

1.CHECK BATTERY

Check battery condition.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the malfunctioning parts.

2.CHECK CHARGING SYSTEM

Check charging system condition.

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace the malfunctioning parts.

3.CHECK SONAR SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check the voltage between sonar control unit harness connector and ground.

Probe			Standard	Voltage (Approx.)
(+)		(-)		
Sonar control unit				
Connector	Terminal			
M4	23	Ground	11.0 V – 15.5 V	12.5 V

Is the inspection result normal?

YES >> GO TO 6.
NO >> GO TO 4.

4.CHECK SONAR SENSOR POWER SUPPLY CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and all rear sonar sensors connector.
3. Turn ignition switch ON.
4. Check the voltage between sonar control unit harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Sonar control unit			
Connector	Terminal		
M4	23	Ground	0 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace harness or connector.

5. CHECK SONAR SENSOR SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Check continuity between sonar control unit harness connector and ground.

Terminals			Continuity
(+)		(–)	
Sonar control unit			
Connector	Terminal		
M4	23	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace harness or connector.

6. PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Connect sonar control unit connector and all rear sonar sensors connector.
2. Turn ignition switch ON.
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to SN-169, "DTC Description".

Is DTC “B1286-1C” detected as the current malfunction?

YES >> GO TO 7.
NO >> GO TO 8.

7. REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 8.

8. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B210A POWER SUPPLY AND GROUND CIRCUIT

DTC Description

INFOID:0000000013611668

DTC DETECTION LOGIC

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition	
B210A	00	Power Supply circuit (The power supply in the system is too low)	[NO SUBTYPE IN-FORMATION]	Diagnosis condition	Ignition switch: ON suppressed when: • Power up to 10 seconds / engine starting or instable engine running • During bus off • During Time out of the message - PN14_STAT; Signal: PN14_SupBat_Volt
				Signal (terminal)	—
				Threshold	By CAN communication received voltage value < 9 V
				Diagnosis delay time	1.5 seconds or more

POSSIBLE CAUSE

00 [NO SUBTYPE INFOMATION]
- The battery voltage is too low.
- Battery
- Alternator

NOTE:
The DTC is set if the value for the battery power supply voltage received via the CAN communication is below the permissible voltage range.

FAIL-SAFE

Sonar system and park assist do not operate.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Turn ignition switch ON and wait at least 2 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “B210A-00” detected?

YES >> Proceed to SN-172, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611669

1.CHECK BATTERY

Check battery condition.

Is the inspection result normal?

YES >> GO TO 2.
NO >> GO TO 3.

2.CHECK CHARGING SYSTEM

Check charging system condition.

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the malfunctioning parts.

>> GO TO 4.

4. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPRCTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B210B POWER SUPPLY AND GROUND CIRCUIT

DTC Description

INFOID:0000000013611670

DTC DETECTION LOGIC

DTC		CONSULT screen terms		DTC detection condition	
		(Trouble diagnosis content)	[Malfunction type]		
B210B	00	Power Supply circuit (The power supply in the system is too high)	[NO SUBTYPE IN-FOMATION]	Diagnosis condition	Ignition switch: ON suppressed when: • Power up to 10 seconds / engine starting or instable engine running • During bus off • During Time out of the message - PN14_STAT; Signal: PN14_SupBat_Volt
				Signal (terminal)	—
				Threshold	By CAN communication received voltage value > 16 V
				Diagnosis delay time	1.5 seconds or more

POSSIBLE CAUSE

00 [NO SUBTYPE INFOMATION]
- The battery voltage is too high
- Battery
- Alternator

NOTE:
The DTC is set if the value for the battery voltage received via the CAN communication is above the permissible voltage range.

FAIL-SAFE

Sonar system and park assist do not operate.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Turn ignition switch ON and wait at least 2 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “B210B-00” detected?

YES >> Proceed to SN-174, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611671

1.CHECK CHARGING SYSTEM

Check charging system condition.

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 2.

2.REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the malfunctioning parts.

>> GO TO 3.

3.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPRCTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B210C POWER SUPPLY AND GROUND CIRCUIT

DTC Description

INFOID:0000000013611672

DTC DETECTION LOGIC

DTC		CONSULT screen terms		DTC detection condition	
		(Trouble diagnosis content)	[Malfunction type]		
B210C	16	Power supply is outside valid range (The power supply is outside the valid range)	[CIRC VOLT BELOW THRESHOLD]	Diagnosis condition	Ignition switch: ON suppressed when: • Power up to 10 seconds / engine starting or instable engine running • During bus off
				Signal (terminal)	Battery power supply signal
				Threshold	Measured voltage value of the sonar control unit operation voltage < 8.5 volt
				Diagnosis delay time	5.0 seconds or more
B210C	17	Power supply is outside valid range (The power supply is outside the valid range)	[CIRC VOLT ABOVE THRESHOLD]	Diagnosis condition	Ignition switch: ON suppressed when: • Power up to 10 seconds / engine starting or instable engine running • During bus off
				Signal (terminal)	Battery power supply signal
				Threshold	Measured voltage value of the sonar control unit operation voltage > 16.5 volt
				Diagnosis delay time	5.0 seconds or more

POSSIBLE CAUSE

16 [CIRC VOLT BELOW THRESHOLD]
Malfunction of the vehicle electric system

17 [CIRC VOLT ABOVE THRESHOLD]
Malfunction of the vehicle electric system

FAIL-SAFE

The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Turn ignition switch ON and wait at least 5 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “B210C-16” or “B210C-17” detected?

YES >> Proceed to SN-176, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611673

1.CHECK BATTERY

Check battery condition.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the malfunctioning parts.

2.CHECK FUSE

Check that the following fuse are not blown.

Signal name	Fuse No.
Battery power supply	43

Is the fuse blown (open)?

YES >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.
NO >> GO TO 3.

3.CHECK POWER SUPPLY CIRCUIT (1)

1. Turn the ignition switch OFF.
2. Disconnect sonar control unit connector.
3. Check voltage between sonar control unit harness connectors.

Terminals				Voltage (Standard)	Voltage (Reference value)
(+)		(−)			
sonar control unit					
Connector	Terminal	Connector	Terminal		
M4	15	M4	13	11 – 11.5 V	Battery voltage

Is the measurement value normal?

YES >> GO TO 4.
NO >> GO TO 5.

4.CHECK INTERMITTENT INCIDENT

In the event of stored DTC with high frequency count or in the event of customer complaints, check electrical lines and connectors for loose contact and corrosion. Refer to GI-56, "Intermittent Incident".

>> GO TO 8.

5.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the connector of sonar control unit.
3. Check the terminals and connectors of the sonar control unit for damage, bend and loose connection (unit side and connector side).

Is the measurement value normal?

YES >> GO TO 6.
NO >> GO TO 7.

6.CHECK SONAR CONTROL UNIT GROUND CIRCUIT

Check continuity between sonar control unit harness connector and ground connections.

Sonar control unit		Ground connections	Continuity
Connector	Terminal		
M4	13	M76	Existed

NOTE:
If the actual value is > 15.5V and other control units are also reporting an over voltage, check regulator and alternator.

Is the inspection result normal?

YES >> GO TO 8.
NO >> GO TO 7.

7. REPAIR OR REPLACE HARNESS OR CONNECTOR

Repair or replace harness or connector.

>> GO TO 8.

8. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B2232 SONAR CONTROL UNIT

DTC Description

INFOID:0000000013611674

DTC DETECTION LOGIC

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition	
B2232	47	Control unit parking system has malf (Control unit 'Parking system' has a malfunction)	[WATCHDOG/ SAFETY UC FAILURE]	Diagnosis condition	Ignition switch: ON
				Signal (terminal)	—
				Threshold	Internal status error
				Diagnosis delay time	1.0 second or less
B2232	55	Control unit parking system has malf (Control unit 'Parking system' has a malfunction)	[NOT CONFIURED]	Diagnosis condition	Ignition switch: OFF > ON
				Signal (terminal)	—
				Threshold	Missing/ wrong configuration
				Diagnosis delay time	3.0 seconds or more
B2232	96	Control unit parking system has malf (Control unit 'Parking system' has a malfunction)	[CMPNENT INTERNAL MLFNCTN]	Diagnosis condition	Ignition switch: ON
				Signal (terminal)	—
				Threshold	Internal error was detected
				Diagnosis delay time	1.0 second or less

POSSIBLE CAUSE

47 [CIRC VOLT BELOW THRESHOLD]
Internal status error

55 [NOT CONFIURED]
Configure control unit (write valid coding string)

96 [CMPNENT INTERNAL MLFNCTN]
Sonar control unit has an internal error

FAIL-SAFE

The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Turn ignition switch ON and wait at least 3 seconds or more.
2. Select "Self Diagnostic Result" mode of "Parking assist" using CONSULT.
3. Check DTC.

Is DTC "B2232-47", "B2232-55" or "B2232-96" detected?

YES >> Proceed to SN-179, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611675

B2232-47

1.WAIT FOR BUS TO GO IDLE

1. Disconnect sonar control unit connector.
2. Wait for bus to go idle.

NOTE:
Bus idle exists if ignition is switched off and there has been no CAN activity for 20 second.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Turn ignition switch ON.
2. Perform DTC confirmation procedure again. Refer to SN-179, "DTC Description".

Is DTC “B2232-47” detected as the current malfunction?

YES >> GO TO 3.
NO >> GO TO 4.

3.CHECK SOFTWARE

1. Turn ignition switch OFF.
2. Replace sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 4.

4.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B2232-55

1.PERFORM CONFIGURATION

With CONSULT
Perform configuration of sonar control unit. Refer to SN-61, "Description".

>> GO TO 2.

2.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

B2232-96

1.ERASE DTC

With CONSULT
1. Turn ignition switch ON.
2. Erase DTC.

>> GO TO 2.

2.PERFORM SONAR SYSTEM FUNCTION CHECK

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

With CONSULT
1. Turn ignition switch ON.
2. Perform DTC confirmation procedure again. Refer to SN-179, "DTC Description".

Is DTC “B2232-96” detected as the current malfunction?

YES >> GO TO 4.
NO >> GO TO 5.

4.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END.
NO >> Check DTC. Refer to SN-39, "DTC Index".

U0037 CAN COMM CIRCUIT

DTC Description

INFOID:0000000013611676

DTC DETECTION LOGIC

DTC		CONSULT screen terms		DTC detection condition	
		(Trouble diagnosis content)	[Malfunction type]		
U0037	88	Vehicle communication bus B (Communication with the chassis CAN bus has a malfunction)	[BUS OFF]	Diagnosis condition	CAN-Battery voltage error active/in filtration
				Signal (terminal)	CAN communication signal
				Threshold	The Suspension-CAN-Communication has a malfunction. Bus Off.
				Diagnosis delay time	1 second or less

POSSIBLE CAUSE

88 [BUS OFF]
CAN Communication disturbed
NOTE:
- A bus OFF error code is set if the control unit cannot transmit a certain number of messages to the CAN bus or if the messages are incomplete.
- The control unit then shuts itself off from the CAN bus for a short time.

FAIL-SAFE

The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Turn ignition switch ON and wait at least 2 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “U0037-88” detected?

YES >> Proceed to SN-182, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611677

U0037-88 Vehicle communication bus B [BUS OFF]

1.CHECK INTERMITTENT INCIDENT

In the event of stored DTC with high frequency count or in the event of customer complaints, check electrical lines and connectors for loose contact and corrosion. Refer to GI-56, "Intermittent Incident".

>> GO TO 2.

2.CAN COMMUNICATION SYSTEM DIAGNOSIS

Perform the trouble diagnosis for CAN communication system. Refer to LAN-58, "Trouble Diagnosis Flow Chart".

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 4.

3.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the sonar control unit. Refer to SN-200, "Removal and Installation".

>> GO TO 5.

4. REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the malfunctioning parts.

>> GO TO 5.

5. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Check DTC. Refer to SN-39, "DTC Index".

U0100 CAN COMM CIRCUIT

DTC Description

INFOID:0000000013611678

DTC DETECTION LOGIC

DTC		CONSULT screen terms		DTC detection condition	
		(Trouble diagnosis content)	[Malfunction type]		
U0100	87	Communication error (Communication with the control unit “combustion engine” has a malfunction)	[MISSING MESSAGE]	Diagnosis condition	CAN-Battery voltage error active/in filtration
				Signal (terminal)	CAN communication signal
				Threshold	Missing CAN-Messages
				Diagnosis delay time	—

POSSIBLE CAUSE

87 [MISSING MESSAGE]
- CAN Communication disturbed
- ECM

NOTE:
- A bus OFF error code is set if the control unit cannot transmit a certain number of messages to the CAN bus or if the messages are incomplete.
- The control unit then shuts itself off from the CAN bus for a short time.

FAIL-SAFE

Sonar system and park assist do not operate.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Turn ignition switch ON and wait at least 2 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “U0100-87” detected?

YES >> Proceed to SN-184, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611679

U0100-87

1.CHECK INTERMITTENT INCIDENT

In the event of stored DTC with high frequency count or in the event of customer complaints, check electrical lines and connectors for loose contact and corrosion. Refer to GI-56, "Intermittent Incident".

>> GO TO 2.

2.CAN COMMUNICATION SYSTEM DIAGNOSIS

Perform the trouble diagnosis for CAN communication system. Refer to LAN-58, "Trouble Diagnosis Flow Chart".

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 4.

3.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.

2. Replace the ECM. Refer to EC-963, "Removal and Installation".

>> GO TO 5.

4. REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the malfunctioning parts.

>> GO TO 5.

5. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPRCTION END
NO >> Check DTC. Refer to SN-39, "DTC Index".

U0101 CAN COMM CIRCUIT

DTC Description

INFOID:0000000013611680

DTC DETECTION LOGIC

DTC		CONSULT screen terms		DTC detection condition	
		(Trouble diagnosis content)	[Malfunction type]		
U0101	87	COMMUNICATION ERROR (LOST) (Communication with control unit “Transmission” has a malfunction)	[MISSING MESSAGE]	Diagnosis condition	• 10 seconds after ignition switch ON • Bus-Battery voltage error active / in filtration
				Signal (terminal)	CAN communication signal
				Threshold	Missing CAN-Messages
				Diagnosis delay time	1.2 seconds or more

POSSIBLE CAUSE

87 MISSING MESSAGE]
- CAN Communication disturbed
- TCM

NOTE:
- A bus OFF error code is set if the control unit cannot transmit a certain number of messages to the CAN bus or if the messages are incomplete.
- The control unit then shuts itself off from the CAN bus for a short time.

FAIL-SAFE

The LED on the sonar system switch will illuminate (red) and cancellation tone will be heard for less than 2 seconds.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Turn ignition switch ON and wait at least 15 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “U0101-87” detected?

YES >> Proceed to SN-186, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611681

U0101-87

1.CHECK INTERMITTENT INCIDENT

In the event of stored DTC with high frequency count or in the event of customer complaints, check electrical lines and connectors for loose contact and corrosion. Refer to GI-56, "Intermittent Incident".

>> GO TO 2.

2.CAN COMMUNICATION SYSTEM DIAGNOSIS

Perform the trouble diagnosis for CAN communication system. Refer to LAN-58, "Trouble Diagnosis Flow Chart".

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 4.

3.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the TCM. Refer to TM-254, "Disassembly and Assembly".

>> GO TO 5.

4.REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the malfunctioning parts.

>> GO TO 5.

5.CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPRCTION END
NO >> Check DTC. Refer to SN-39, "DTC Index".

U0122 CAN COMM CIRCUIT

DTC Description

INFOID:0000000013611682

DTC DETECTION LOGIC

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition	
U0122	87	Lost Communication With VDCM (Communication with control unit 'Traction system' has a malfunction)	[MISSING MESSAGE]	Diagnosis condition	• 10 seconds after ignition switch ON • Bus-Battery voltage error active / in filtration
				Signal (terminal)	CAN communication signal
				Threshold	Missing CAN-Messages
				Diagnosis delay time	1.2 seconds or more

POSSIBLE CAUSE

87 [MISSING MESSAGE]
- CAN Communication disturbed
- Electronic stability program control unit

NOTE:
- A bus OFF error code is set if the control unit cannot transmit a certain number of messages to the CAN bus or if the messages are incomplete.
- The control unit then shuts itself off from the CAN bus for a short time.

FAIL-SAFE

Sonar system and park assist do not operate.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Turn ignition switch ON and wait at least 2 seconds or more.
2. Select "Self Diagnostic Result" mode of "Parking assist" using CONSULT.
3. Check DTC.

Is DTC "U0122-87" detected?

YES >> Proceed to SN-188, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611683

U0122-87

1.CHECK INTERMITTENT INCIDENT

In the event of stored DTC with high frequency count or in the event of customer complaints, check electrical lines and connectors for loose contact and corrosion. Refer to GI-56, "Intermittent Incident".

>> GO TO 2.

2.CAN COMMUNICATION SYSTEM DIAGNOSIS

Perform the trouble diagnosis for CAN communication system. Refer to LAN-58, "Trouble Diagnosis Flow Chart".

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 4.

3.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the electronic stability program control unit. Refer to BRC-975, "Removal and Installation".

>> GO TO 5.

4. REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the malfunctioning parts.

>> GO TO 5.

5. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPRCTION END
NO >> Check DTC. Refer to SN-39, "DTC Index".

U0128 CAN COMM CIRCUIT

DTC Description

INFOID:0000000013611684

DTC DETECTION LOGIC

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition	
U0128	87	COMMUNICATION ERROR (LOST) (Communication with the electric parking brake has a malfunction)	[MISSING MESSAGE]	Diagnosis condition	• 10 seconds after ignition switch ON • Bus-Battery voltage error active / in filtration
				Signal (terminal)	CAN communication signal
				Threshold	Missing CAN-Messages
				Diagnosis delay time	1.2 seconds or more

POSSIBLE CAUSE

87 [MISSING MESSAGE]
- CAN Communication disturbed
- Electric parking brake control module

NOTE:
- A bus OFF error code is set if the control unit cannot transmit a certain number of messages to the CAN bus or if the messages are incomplete.
- The control unit then shuts itself off from the CAN bus for a short time.

FAIL-SAFE

Sonar system and park assist do not operate.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Turn ignition switch ON and wait at least 2 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “U0128-87” detected?

YES >> Proceed to SN-190, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611685

U0128-87

1.CHECK INTERMITTENT INCIDENT

In the event of stored DTC with high frequency count or in the event of customer complaints, check electrical lines and connectors for loose contact and corrosion. Refer to GI-56, "Intermittent Incident".

>> GO TO 2.

2.CAN COMMUNICATION SYSTEM DIAGNOSIS

Perform the trouble diagnosis for CAN communication system. Refer to LAN-58, "Trouble Diagnosis Flow Chart".

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 4.

3.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the electric parking brake control module. Refer to PB-130, "Removal and Installation".

>> GO TO 5.

4. REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the malfunctioning parts.

>> GO TO 5.

5. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPRCTION END
NO >> Check DTC. Refer to SN-39, "DTC Index".

U0131 CAN COMM CIRCUIT

DTC Description

INFOID:0000000013611686

DTC DETECTION LOGIC

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition	
U0131	87	No CAN message EPS C/U (The communication with the ECU “Power steering” has malfunction)	[MISSING MESSAGE]	Diagnosis condition	• 10 seconds after ignition switch ON • Bus-Battery voltage error active / in filtration
				Signal (terminal)	CAN communication signal
				Threshold	Missing CAN-Messages
				Diagnosis delay time	1.0 second or less

POSSIBLE CAUSE

87 [MISSING MESSAGE]
- CAN Communication disturbed
- EPS control unit

NOTE:
- A bus OFF error code is set if the control unit cannot transmit a certain number of messages to the CAN bus or if the messages are incomplete.
- The control unit then shuts itself off from the CAN bus for a short time.

FAIL-SAFE

Sonar system and park assist do not operate.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Turn ignition switch ON and wait at least 2 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “U0131-87” detected?

YES >> Proceed to SN-192, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611687

U0131-87

1.CHECK INTERMITTENT INCIDENT

In the event of stored DTC with high frequency count or in the event of customer complaints, check electrical lines and connectors for loose contact and corrosion. Refer to GI-56, "Intermittent Incident".

>> GO TO 2.

2.CAN COMMUNICATION SYSTEM DIAGNOSIS

Perform the trouble diagnosis for CAN communication system. Refer to LAN-58, "Trouble Diagnosis Flow Chart".

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 4.

3.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the EPS control unit. Refer to STC-57, "Removal and Installation".

>> GO TO 5.

4. REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the malfunctioning parts.

>> GO TO 5.

5. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPRCTION END
NO >> Check DTC. Refer to SN-39, "DTC Index".

U0155 CAN COMM CIRCUIT

DTC Description

INFOID:0000000013611688

DTC DETECTION LOGIC

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition	
U0155	87	COMMUNICATION ERROR (LOST) (Communication with the instrument cluster has a malfunction)	[MISSING MESSAGE]	Diagnosis condition	• 10 seconds after ignition switch ON • Bus-Battery voltage error active / in filtration
				Signal (terminal)	CAN communication signal
				Threshold	Missing CAN-Messages
				Diagnosis delay time	1.2 seconds or more

POSSIBLE CAUSE

87 [MISSING MESSAGE]
- CAN Communication disturbed
- Combination meter

NOTE:
- A bus OFF error code is set if the control unit cannot transmit a certain number of messages to the CAN bus or if the messages are incomplete.
- The control unit then shuts itself off from the CAN bus for a short time.

FAIL-SAFE

Sonar system and park assist do not operate

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Turn ignition switch ON and wait at least 2 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “U0155-87” detected?

YES >> Proceed to SN-194, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611689

U0155-87

1.CHECK INTERMITTENT INCIDENT

In the event of stored DTC with high frequency count or in the event of customer complaints, check electrical lines and connectors for loose contact and corrosion. Refer to GI-56, "Intermittent Incident".

>> GO TO 2.

2.CAN COMMUNICATION SYSTEM DIAGNOSIS

Perform the trouble diagnosis for CAN communication system. Refer to LAN-58, "Trouble Diagnosis Flow Chart".

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 4.

3.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the combination meter. Refer to MWI-155, "Removal and Installation".

>> GO TO 5.

4. REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the malfunctioning parts.

>> GO TO 5.

5. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPRCTION END
NO >> Check DTC. Refer to SN-39, "DTC Index".

U0168 CAN COMM CIRCUIT

DTC Description

INFOID:0000000013611690

DTC DETECTION LOGIC

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition	
U0168	87	COMMUNICATION ERROR (LOST) (Communication with the electronic ignition lock has a malfunction)	[MISSING MESSAGE]	Diagnosis condition	Bus-Battery voltage error active / in filtration
				Signal (terminal)	CAN communication signal
				Threshold	Missing CAN-Messages
				Diagnosis delay time	1.0 second or less

POSSIBLE CAUSE

87 [MISSING MESSAGE]
- CAN Communication disturbed
- Electronic ignition switch control unit

NOTE:
- A bus OFF error code is set if the control unit cannot transmit a certain number of messages to the CAN bus or if the messages are incomplete.
- The control unit then shuts itself off from the CAN bus for a short time.

FAIL-SAFE

Sonar system and park assist do not operate.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Turn ignition switch ON and wait at least 2 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “U0168-87” detected?

YES >> Proceed to SN-196, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611691

U0168-87

1.CHECK INTERMITTENT INCIDENT

In the event of stored DTC with high frequency count or in the event of customer complaints, check electrical lines and connectors for loose contact and corrosion. Refer to GI-56, "Intermittent Incident".

>> GO TO 2.

2.CAN COMMUNICATION SYSTEM DIAGNOSIS

Perform the trouble diagnosis for CAN communication system. Refer to LAN-58, "Trouble Diagnosis Flow Chart".

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 4.

3.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.

2. Replace the electronic ignition switch control unit. Refer to PCS-47, "Removal and Installation".

>> GO TO 5.

4. REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the malfunctioning parts.

>> GO TO 5.

5. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPRCTION END
NO >> Check DTC. Refer to SN-39, "DTC Index".

U0212 CAN COMM CIRCUIT

DTC Description

INFOID:0000000013611692

DTC DETECTION LOGIC

DTC		CONSULT screen terms (Trouble diagnosis content)	CONSULT screen terms [Malfunction type]	DTC detection condition	
U0212	87	COMMUNICATION ERROR (LOST) (Communication with the steering column module has a malfunction)	[MISSING MESSAGE]	Diagnosis condition	• Clamp15 Off • Bus-Battery voltage error active / in filtration
				Signal (terminal)	CAN communication signal
				Threshold	Missing CAN-Messages
				Diagnosis delay time	1.0 second or less

POSSIBLE CAUSE

87 [MISSING MESSAGE]
- CAN Communication disturbed
- Steering column control module

NOTE:
- A bus OFF error code is set if the control unit cannot transmit a certain number of messages to the CAN bus or if the messages are incomplete.
- The control unit then shuts itself off from the CAN bus for a short time.

FAIL-SAFE

Sonar system and park assist do not operate.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Turn ignition switch ON and wait at least 2 seconds or more.
2. Select “Self Diagnostic Result” mode of “Parking assist” using CONSULT.
3. Check DTC.

Is DTC “U0212-87” detected?

YES >> Proceed to SN-198, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-56, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000013611693

U0212-87

1.CHECK INTERMITTENT INCIDENT

In the event of stored DTC with high frequency count or in the event of customer complaints, check electrical lines and connectors for loose contact and corrosion. Refer to GI-56, "Intermittent Incident".

>> GO TO 2.

2.CAN COMMUNICATION SYSTEM DIAGNOSIS

Perform the trouble diagnosis for CAN communication system. Refer to LAN-58, "Trouble Diagnosis Flow Chart".

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 4.

3.REPLACE SONAR CONTROL UNIT

1. Turn ignition switch OFF.
2. Replace the steering column control module. Refer to ST-9, "Removal and Installation".

>> GO TO 5.

4. REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the malfunctioning parts.

>> GO TO 5.

5. CONFIRMATION AFTER REPAIR

With CONSULT
1. Turn ignition switch ON.
2. Select “Work support” mode of “Parking assist” using CONSULT.
3. Perform “ELECTRICAL CONTACTING OF SENSORS” of “Work support” mode.

Is the inspection result normal?

YES >> INSPRCTION END
NO >> Check DTC. Refer to SN-39, "DTC Index".

REMOVAL AND INSTALLATION

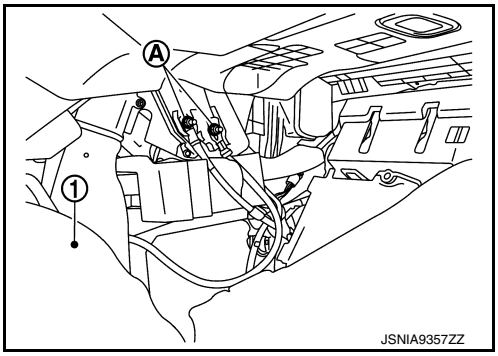
SONAR CONTROL UNIT

Removal and Installation

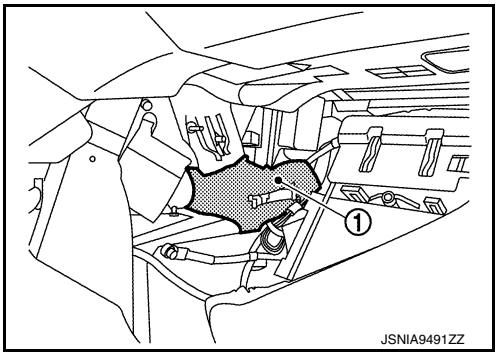
INFOID:0000000013611694

REMOVAL

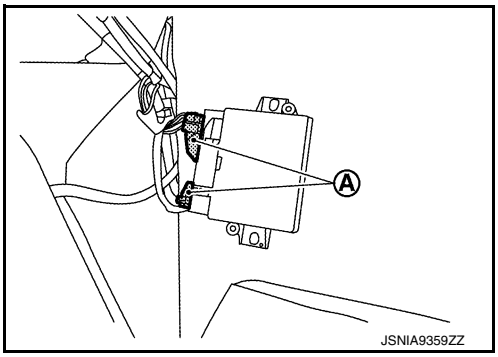
1. Fold back floor carpet ① passenger footwell and remove harness nuts Ⓐ.



2. Remove sonar control unit out of the protective sleeve ①.



3. Disconnect sonar control unit connector Ⓐ.



INSTALLATION

Install in the reverse order of removal.

CAUTION:

Be sure to perform “Read/Write Configuration” when replacing sonar control unit. For details, refer to SN-61, "Description".

SONAR SYSTEM SWITCH

Removal and Installation

INFOID:0000000013611695

REMOVAL

Refer to BCS-252, "Removal and Installation".

NOTE:

Always remove sonar system switch together with upper control panel control unit.

INSTALLATION

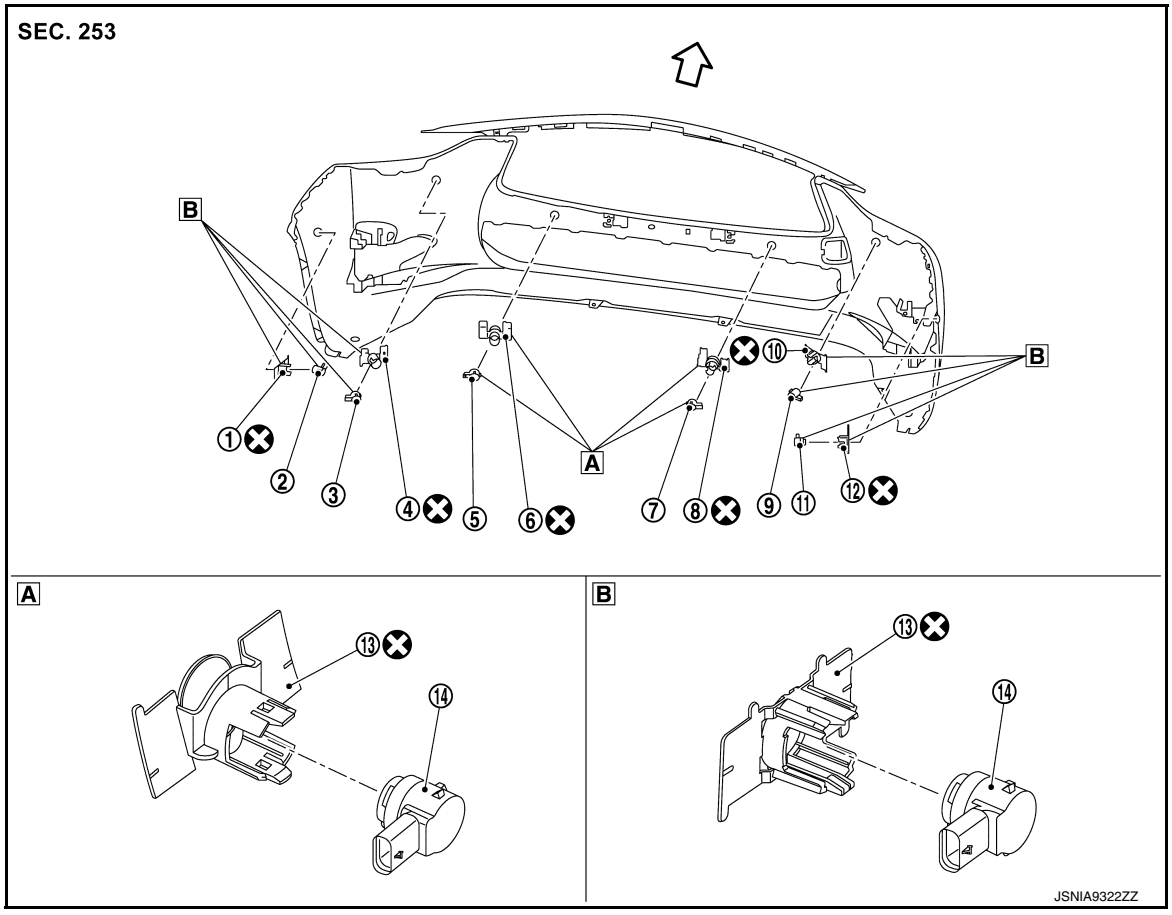
Install in the reverse order of removal.

SONAR SENSOR

FRONT

FRONT : Exploded View

INFOID:0000000013611696



① Side sensor front LH holder
② Side sensor front LH
③ Corner sensor front LH
④ Corner sensor front LH holder
⑤ Center sensor front LH
⑥ Center sensor front LH holder
⑦ Center sensor front RH
⑧ Center sensor front RH holder
⑨ Corner sensor front RH
⑩ Corner sensor front RH holder
⑪ Side sensor front RH
⑫ Side sensor front RH holder
⑬ Sensor holder
⑭ Sonar sensor
A Details of center sensor
B Details of corner sensor and side sensor

⇦ : Vehicle front

⊗ : Always replace after every disassembly.

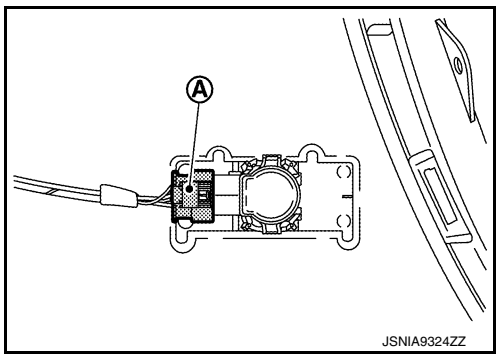
FRONT : Removal and Installation

INFOID:0000000013611697

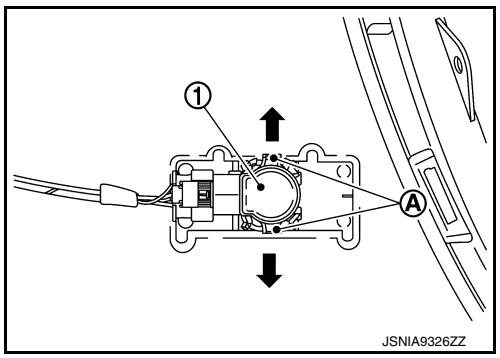
REMOVAL

1. Remove front bumper fascia assembly. Refer to EXT-21, "Removal and Installation".
   NOTE:
   When removing only side sensor and corner sensor, remove front fender protector. Refer to EXT-41, "FENDER PROTECTOR : Removal and Installation".

2. Disconnect sonar sensor connector Ⓐ.



3. Unhook the pawl Ⓐ to remove sonar sensor ①.



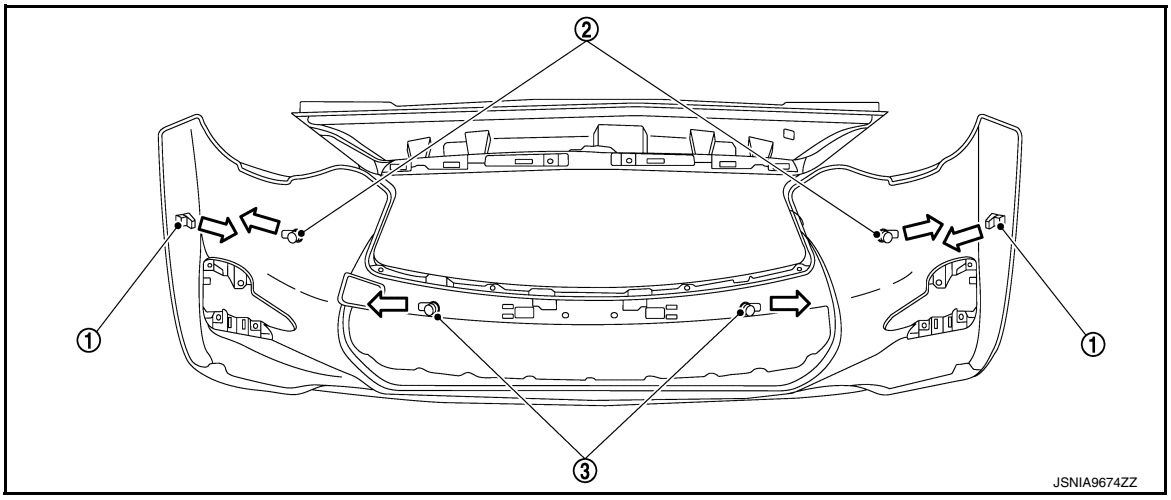
INSTALLATION

NOTE:

When replacing sensor holder, replace bumper as well.

CAUTION:

- **Check sonar sensor packing for damage before installation.**
- **Check that the packing is properly installed to the sonar sensor.**
- **Install it so that the connector of the sensor turns to the arrow direction of the figure.**

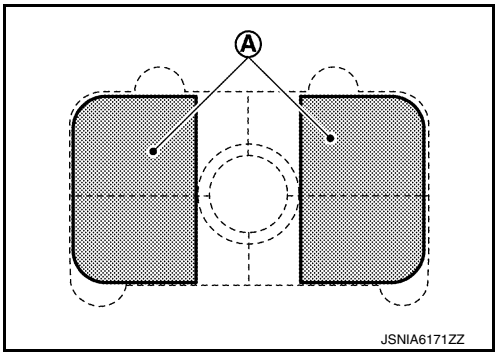


① Side sensor front ② Corner sensor front ③ Center sensor front

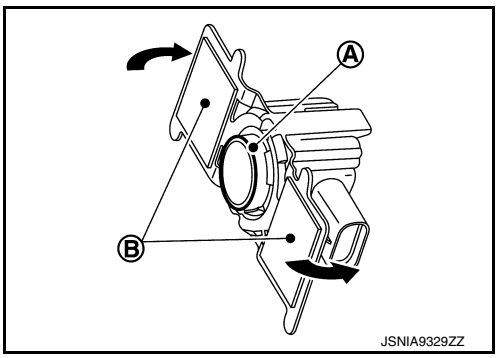
⇦ : Connector direction

1. Install sonar sensor to sensor holder.

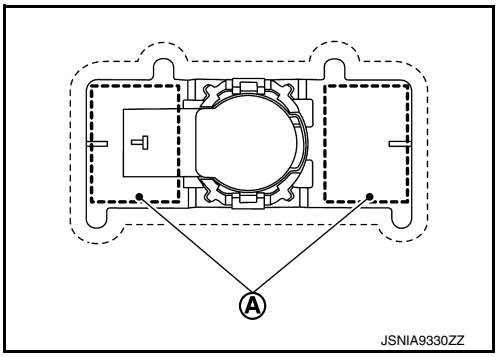
2. Apply primer to sensor mounting part Ⓐ of bumper.
CAUTION:
Never apply two coats of primer. Applying two coats or more of primer results in excessively thick film and this may allow the sensor finisher to come off from primer under exfoliation.



3. Remove the film of double-sided tape, bend sensor holder in the direction shown by arrow so that double-sided tape Ⓑ does not contact bumper, and align portion Ⓐ of sonar sensor with the bumper hole.



4. Press portion Ⓐ of sensor finisher to paste the sensor holder to bumper as shown in the figure.

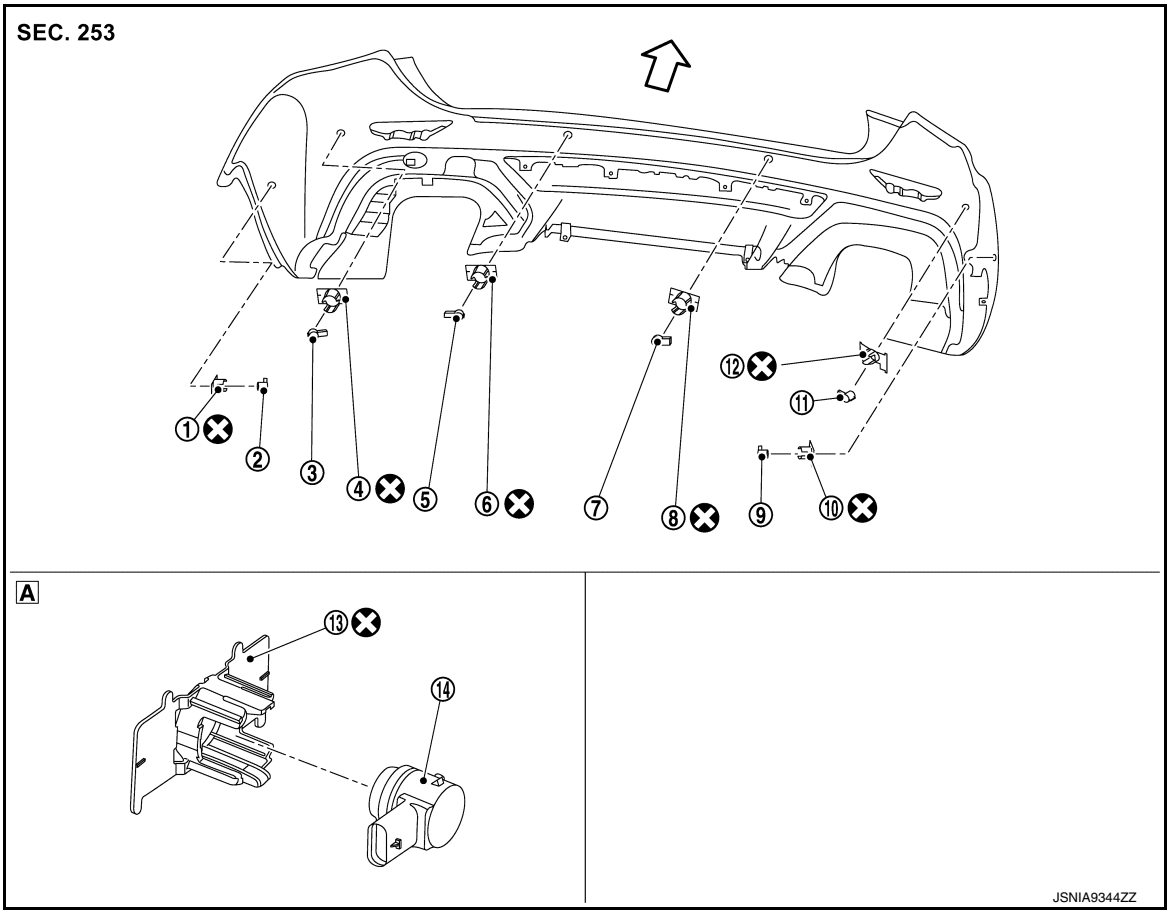


5. Connect connector to sonar sensor.
6. Install front bumper fascia assembly. Refer to EXT-21, "Removal and Installation".

REAR

REAR : Exploded View

INFOID:0000000013611698



① Side sensor rear RH holder
② Side sensor rear RH
③ Corner sensor rear RH
④ Corner sensor rear RH holder
⑤ Center sensor rear RH
⑥ Center sensor rear RH holder
⑦ Center sensor rear LH
⑧ Center sensor rear LH holder
⑨ Side sensor rear LH
⑩ Side sensor rear LH holder
⑪ Corner sensor rear LH
⑫ Corner sensor rear LH holder
⑬ Sensor holder
⑭ Sonar sensor
A Details
⇦ : Vehicle rear
⊗ : Always replace after every disassembly.

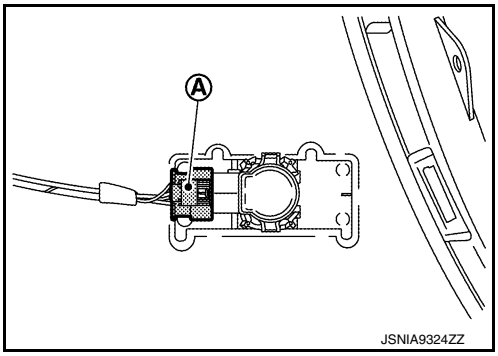
REAR : Removal and Installation

INFOID:0000000013611699

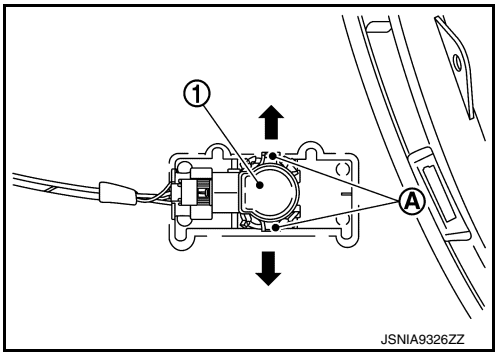
REMOVAL

1. Remove rear bumper fascia assembly. Refer to EXT-29, "Removal and Installation".
   NOTE:
   When removing only side sensor and corner sensor, remove rear wheel house protector. Refer to EXT-42, "REAR WHEEL HOUSE PROTECTOR : Removal and Installation".

2. Disconnect sonar sensor connector Ⓐ.



3. Unhook the pawl Ⓐ to remove sonar sensor ①.



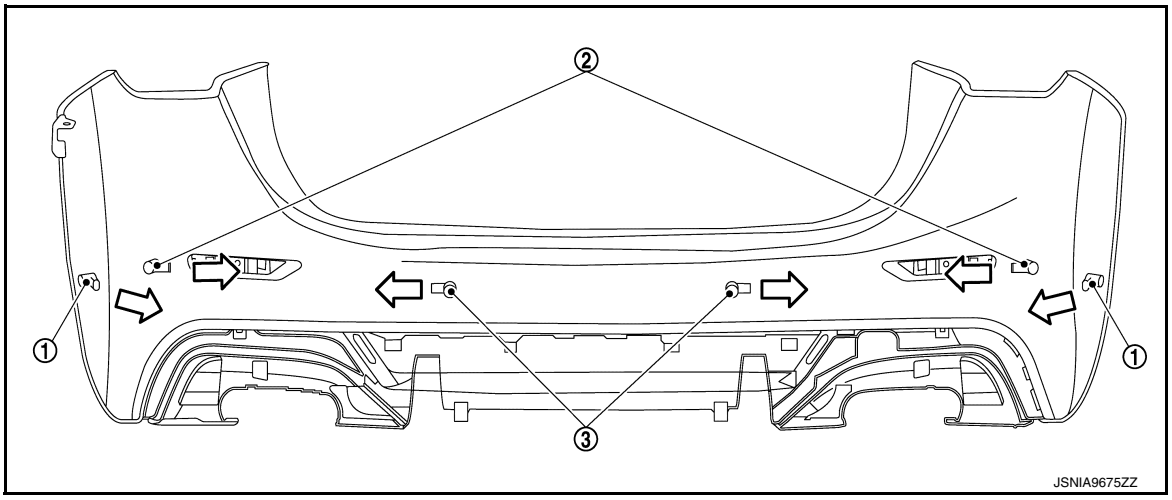
INSTALLATION

NOTE:

When replacing sensor holder, replace bumper as well.

CAUTION:

- **Check sonar sensor packing for damage before installation.**
- **Check that the packing is properly installed to the sonar sensor.**
- **Install it so that the connector of the sensor turns to the arrow direction of the figure.**

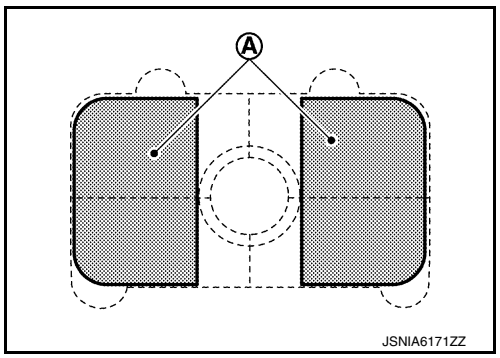


① Side sensor rear ② Corner sensor rear ③ Center sensor rear

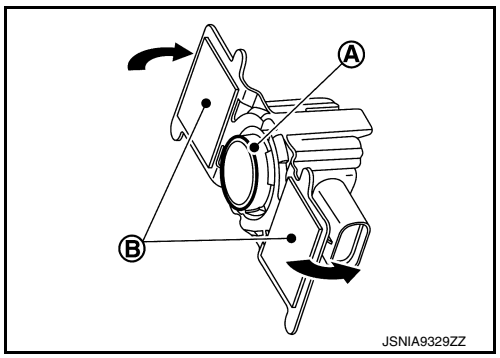
⇦ : Connector direction

1. Install sonar sensor to sensor holder.

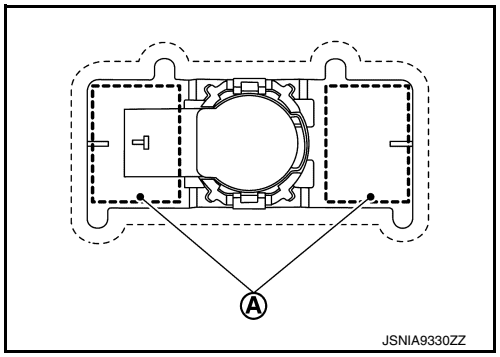
2. Apply primer to sensor mounting part Ⓐ of bumper.
CAUTION:
Never apply two coats of primer. Applying two coats or more of primer results in excessively thick film and this may allow the sensor finisher to come off from primer under exfoliation.



3. Remove the film of double-sided tape, bend sensor holder in the direction shown by arrow so that double-sided tape Ⓑ does not contact bumper, and align portion Ⓐ of sonar sensor with the bumper hole.



4. Press portion Ⓐ of sensor finisher to paste the sensor holder to bumper as shown in the figure.



5. Connect connector to sonar sensor.
6. Install rear bumper fascia assembly. Refer to EXT-29, "Removal and Installation".