

SECTION **SN**
SONAR SYSTEM

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PRECAUTIONS

< PRECAUTION >

PRECAUTION

PRECAUTIONS

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

INFOID:000000007463573

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the "SRS AIR BAG" and "SEAT BELT" of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

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COMPONENT PARTS

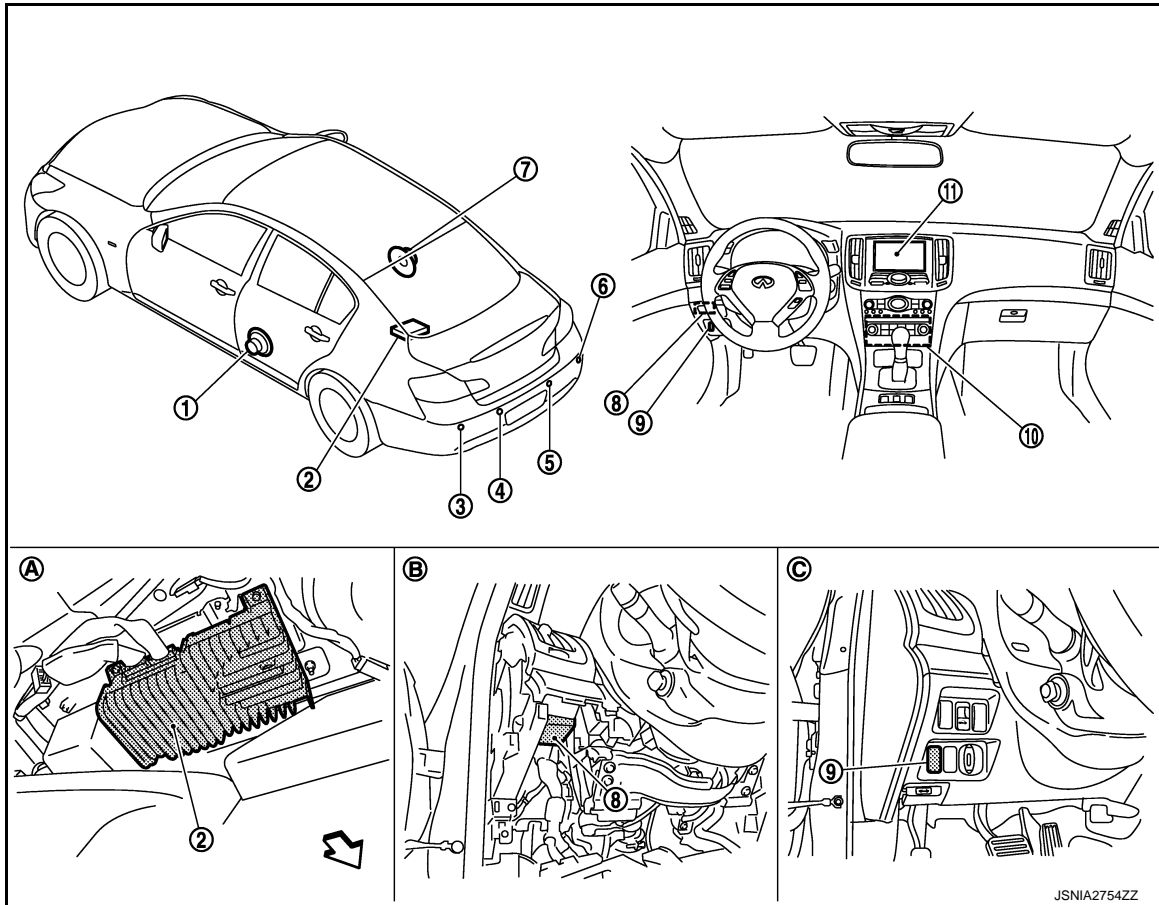
< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

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- | | | |
|------------------------------------|--|----------------------------------|
| 1. Rear door speaker LH | 2. BOSE amp. | 3. Corner sensor rear LH |
| 4. Center sensor rear LH | 5. Center sensor rear RH | 6. Corner sensor rear RH |
| 7. Rear door speaker RH | 8. Sonar control unit | 9. Sonar cancel switch |
| 10. AV control unit | 11. Display unit | |
| A. Lower part of rear parcel shelf | B. Instrument driver lower panel removed condition | C. Instrument driver lower panel |

Component Description

INFOID:000000007463575

WITHOUT NAVIGATION

Component	Description
SONAR CONTROL UNIT	<ul style="list-style-type: none"> An integrated warning buzzer sounds when receiving a sensor signal from the corner/center sensor. The sonar system starts when receiving a reverse signal. Converts a signal received from the corner sensor and the center sensor into a distance signal (center sensor: four levels, corner sensor: three levels) to transmit it to the AV control unit via AV communication. The sonar system turns OFF when receiving a sonar cancel switch signal. Capable of system settings and trouble diagnoses with CONSULT (K-LINE).
CORNER SENSOR REAR (LH, RH)	When a distance from an obstacle is detected, a distance signal is transmitted to the sonar control unit.

COMPONENT PARTS

< SYSTEM DESCRIPTION >

Component	Description
CENTER SENSOR REAR (LH, RH)	When a distance from an obstacle is detected, a distance signal is transmitted to the sonar control unit.
SONAR CANCEL SWITCH	The sonar cancel switch signal is transmitted to the sonar control unit.
AV CONTROL UNIT	<ul style="list-style-type: none"> • An image on the display is switched between the AV control unit and the display unit via serial communication. • An RGB image signal is transmitted to the AV control unit.
DISPLAY UNIT	<ul style="list-style-type: none"> • An RGB image signal is transmitted from the AV control unit. • An image on the display is switched between the AV control unit and the display unit via serial communication.

WITH NAVIGATION

Component	Description
SONAR CONTROL UNIT	<ul style="list-style-type: none"> • Converts a signal received from the corner sensor and the center sensor into a distance signal (center sensor: four levels, corner sensor: three levels) to transmit it to the AV control unit via AV communication. • The sonar system starts when receiving a reverse signal. • The sonar system turns OFF when receiving a sonar cancel switch signal. • Capable of system settings and trouble diagnoses with CONSULT (K-LINE).
CORNER SENSOR REAR (LH, RH)	When a distance from an obstacle is detected, a distance signal is transmitted to the sonar control unit.
CENTER SENSOR REAR (LH, RH)	When a distance from an obstacle is detected, a distance signal is transmitted to the sonar control unit.
SONAR CANCEL SWITCH	The sonar cancel switch signal is transmitted to the sonar control unit.
AV CONTROL UNIT	<ul style="list-style-type: none"> • An image on the display is switched between the AV control unit and the display unit via serial communication. • Transmits an RGB digital image signal to the display unit and a sound signal (buzzer) to the BOSE amp., based on the signal received from the sonar control unit via AV communication.
DISPLAY UNIT	<ul style="list-style-type: none"> • An RGB digital image signal is transmitted from the AV control unit. • An image on the display is switched between the AV control unit and the display unit via serial communication.
BOSE AMP.	Receives a sound signal (buzzer) from the AV control unit and transmits the signal to the door speakers (LH, RH).
REAR DOOR SPEAKER (LH, RH)	Receives a sound signal (buzzer) from the AV control unit to allow the buzzer to sound.

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SONAR SYSTEM

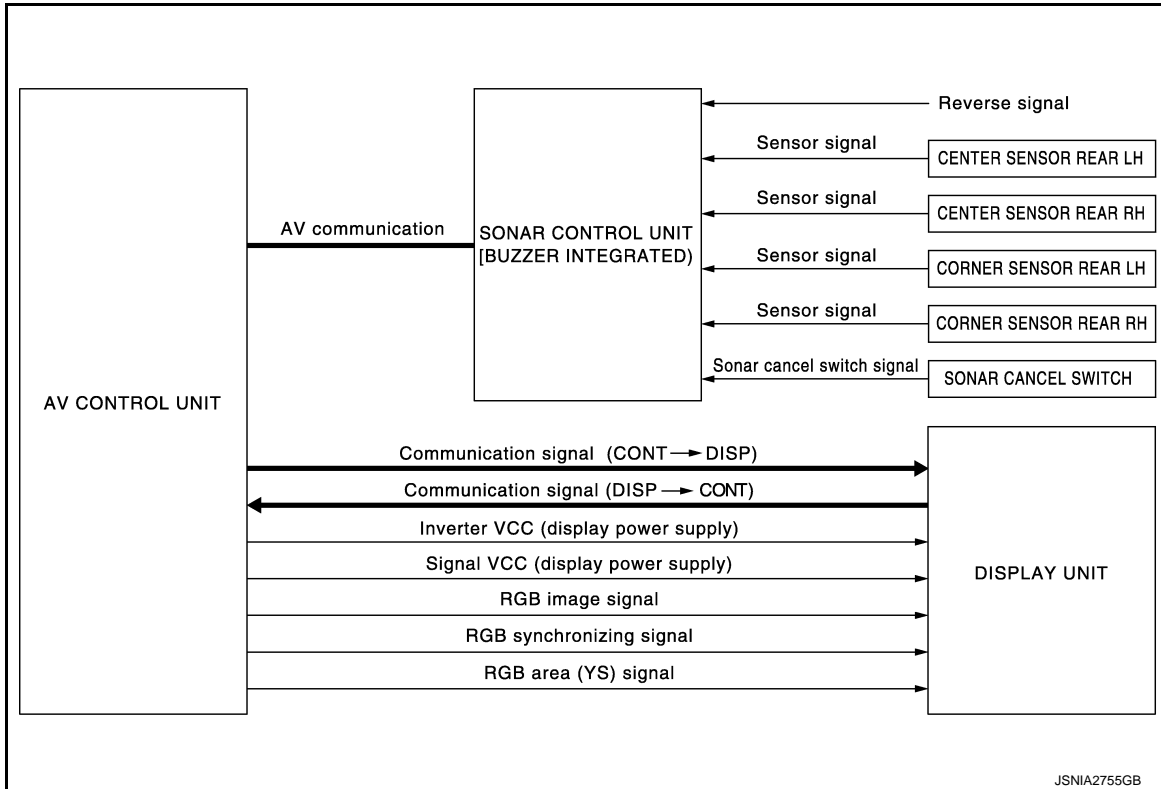
< SYSTEM DESCRIPTION >

SONAR SYSTEM

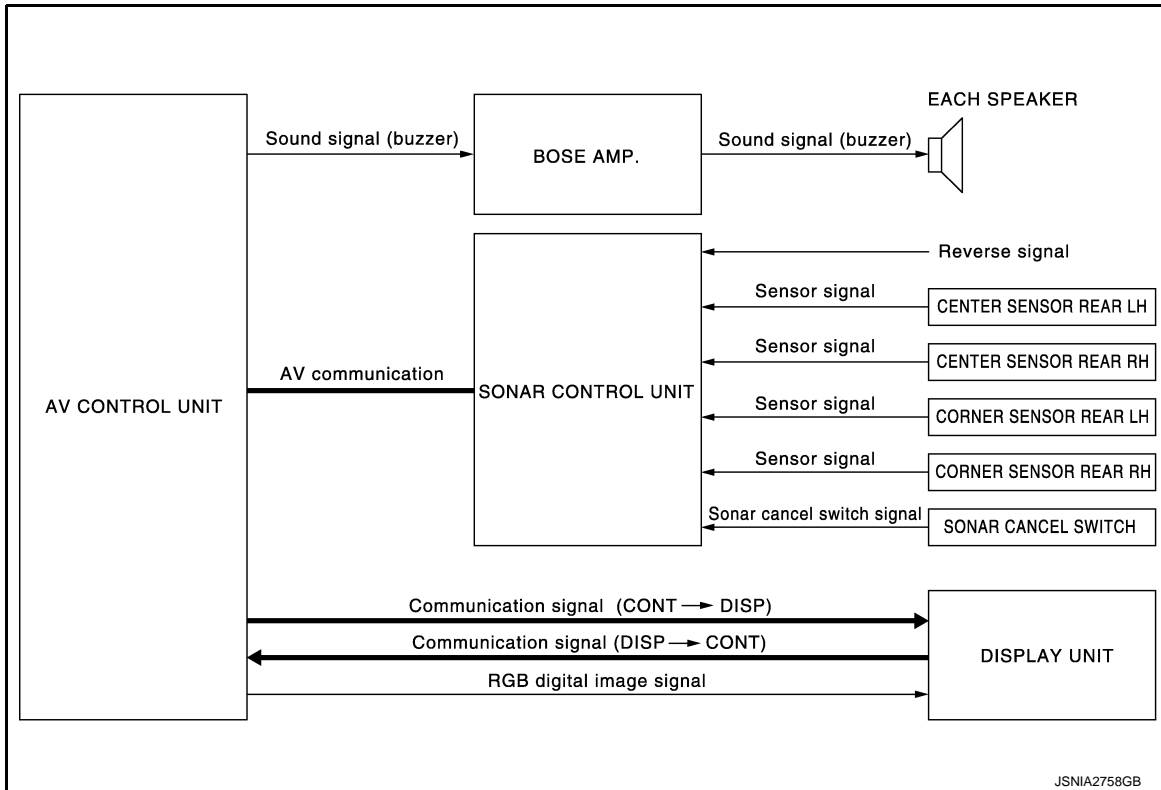
System Diagram

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WITHOUT NAVIGATION



WITH NAVIGATION



SONAR SYSTEM

< SYSTEM DESCRIPTION >

System Description

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WITHOUT NAVIGATION

- The sonar sensor installed to the rear bumper detects obstacles around the rear bumper.
- When the rear corner sensor or the rear center sensor detects an obstacle during rear view monitor indication, the buzzer built in the sonar control unit sounds and the location of the obstacle is indicated on the display unit by displaying an icon.
- Sonar system turns ON/OFF with the sonar cancel switch.
- The sonar control unit is connected to the AV control unit via the AV communication.
- The sonar control unit is connected to the diagnosis connector via K-Line and allows diagnoses with CONSULT.

WITH NAVIGATION

- The sonar sensor installed to the rear bumper detects obstacles around the rear bumper.
- When the rear corner sensor or the rear center sensor detects an obstacle during rear view monitor indication, the buzzer sounds via each speaker and the location of the obstacle is indicated on the display unit by displaying an icon.
- Sonar system turns ON/OFF with the sonar cancel switch.
- The sonar control unit is connected to the AV control unit via the AV communication.
- Sonar control unit is connected to the diagnosis connector via K-Line and allows diagnoses with CONSULT.

Warning by Buzzer (Without Navigation)

- The cycle of buzzer changes according to the distance from an obstacle: the center sensor, in four levels; the corner sensor, in three levels.
- Each sonar sensor transmits a sensor signal to the sonar control unit when detecting an obstacle.
- When receiving a sensor signal, the buzzer built in the sonar control unit sounds if an obstacle is detected on the rear side of the vehicle.

Warning by Buzzer (With Navigation)

- The cycle of buzzer changes according to the distance from an obstacle: the center sensor, in four levels; the corner sensor, in three levels.
- Each sonar sensor transmits a sensor signal to the sonar control unit when detecting an obstacle.
- The sonar control unit converts a signal received from each sonar sensor into a distance signal (center sensor: four levels, corner sensor: three levels) and transmits it to the AV control unit via AV communication.
- The AV control unit transmits a sound signal (buzzer) to the BOSE amp. when receiving a distance signal from the sonar control unit.
- When receiving a sound signal (buzzer), the BOSE amp. transmits the sound signal (buzzer) to each speaker.
- When each speaker receives a sound signal (buzzer), buzzer sounds.
- When the rear center sensor or the rear corner sensor detects an obstacle, a buzzer is heard from the speakers on the rear side.

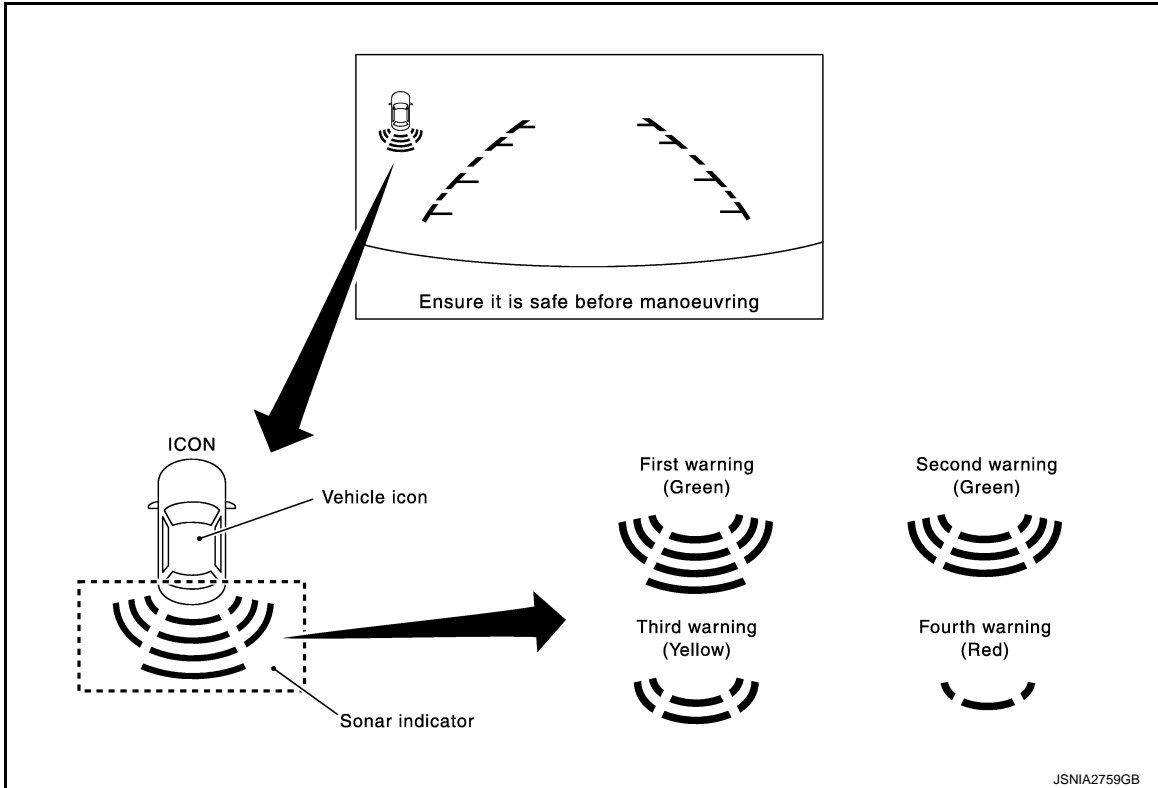
Warning by Indicator

- Detecting an obstacle when in reverse gear, the direction and the distance to the obstacle are displayed on the rear view monitor with icons.
- The color and the number of blinks of the sonar indicator changes, according to the distance to an obstacle (during icon indication).
- The sonar display function can be turned ON/OFF from "SETTING" of "Other". In this case, buzzer sounds by turning OFF the display function.
- Each sonar sensor transmits a sensor signal to the sonar control unit when detecting an obstacle.
- The sonar control unit converts a signal received from each sonar sensor into a distance signal (center sensor: four levels, corner sensor: three levels) and transmits it to the AV control unit via AV communication.
- The AV control unit transmits an RGB image signal to the display unit, based on the received signal. (Without navigation)
- The AV control unit transmits an RGB digital image signal to the display unit, based on the received signal. (With navigation)
- When receiving an RGB image signal, the display unit indicates "Icon display." (Without navigation)
- When receiving an RGB digital image signal, the display unit indicates "Icon display." (With navigation)

SONAR SYSTEM

< SYSTEM DESCRIPTION >

- Warning indications of the sonar system on the display are generated by the AV control unit.



ACTIVATION CONDITION

The rear sensor activates under the following conditions:

- Sonar cancel switch OFF
- Reverse position
- During obstacle detection

x: applicable

Sonar cancel switch	Reverse signal	Sonar sensor
OFF	ON	X*
OFF	OFF	—

NOTE:

*: When the rear sensors simultaneously detect different obstacle:

- The sonar sensor detecting shorter distance from the object has priority to sound a buzzer.

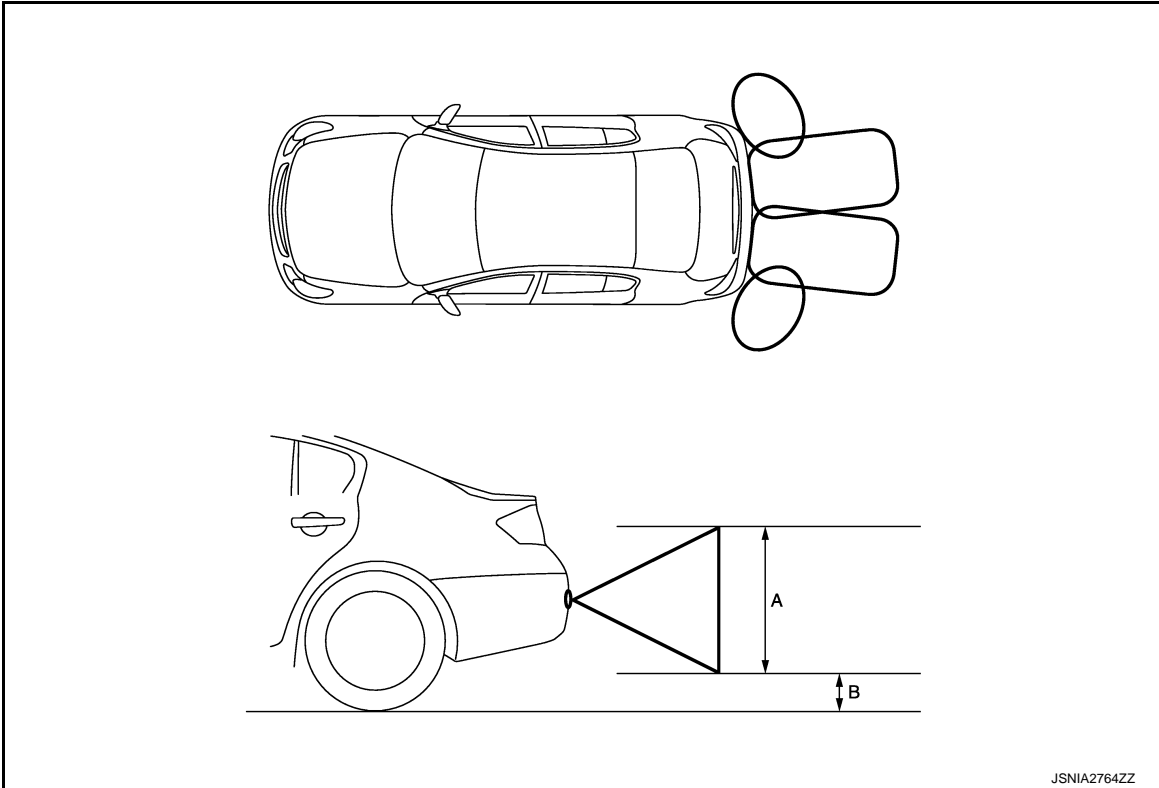
OBSTACLE DETECTION DISTANCE

- The sonar control unit controls the obstacle detection distance. The detection distance differs between the corner sensor and the center sensor.
- The sonar control unit controls a warning buzzer cycle which changes in 4 levels (for center) or in 3 levels (for corner), according to the detection distance.
- The detection condition setting is adjustable in 4 levels with CONSULT. Refer to [SN-11, "CONSULT Function"](#).
- CONSULT enables the center sensor (rear) not to detect the range of 40 cm (15.75 in) or less to prevent from the trailer hitch vehicle detection error. Refer to [SN-11, "CONSULT Function"](#).

SONAR SYSTEM

< SYSTEM DESCRIPTION >

Obstacle detection range image



A. Approx. 50 cm (19.6 in)

B. Approx. 15 cm (5.9 in)

Detection distance (default value)

Warning item	Corner sensor	Center sensor
First warning	—	60 – 100 cm (23.6 – 39.3 in)
Second warning	50 – 60 cm (19.6 – 23.6 in)	50 – 60 cm (19.6 – 23.6 in)
Third warning	30 – 50 cm (11.8 – 19.6 in)	30 – 50 cm (11.8 – 19.6 in)
Fourth warning	Less than 30 cm (11.8 in)	Less than 30 cm (11.8 in)

Warning Buzzer Frequency

- The warning buzzer cycle changes between 4 levels (for rear center) and 3 levels (for rear corner), according to the detection distance.

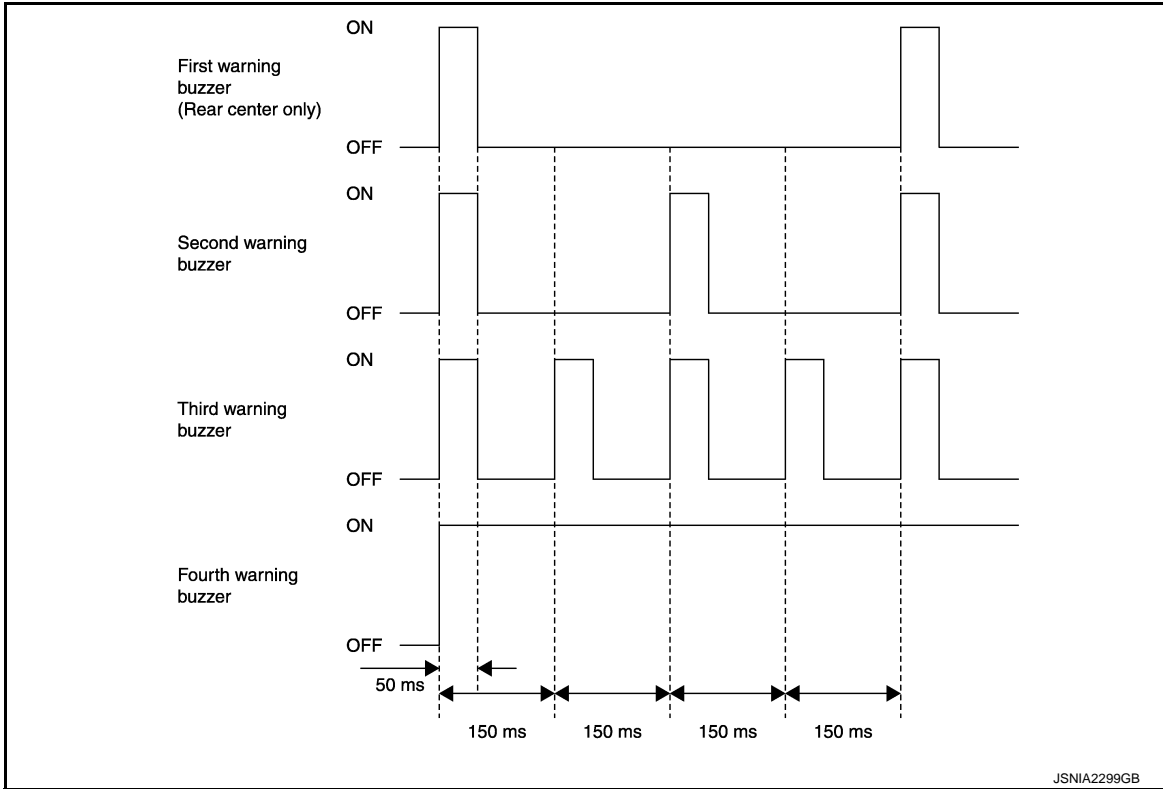
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SONAR SYSTEM

< SYSTEM DESCRIPTION >

- The nearest sensor from the detected obstacle determines the buzzer cycle if plural sensors simultaneously detect obstacles.



NOTE:

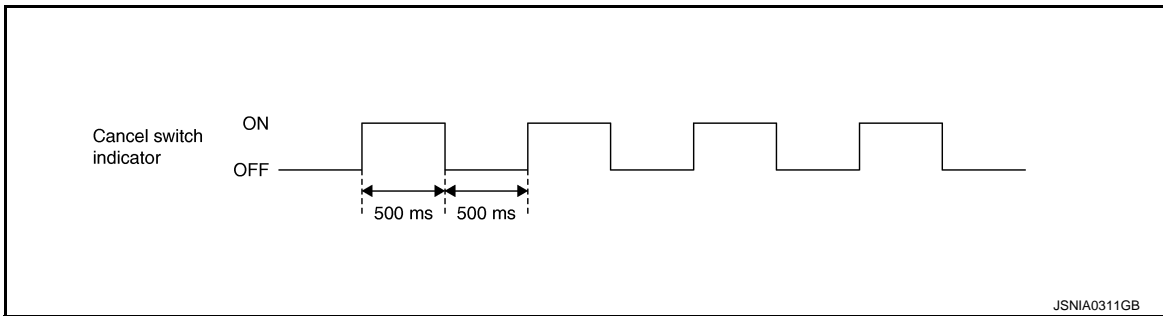
The warning buzzer of the corner sensor sounds as follows:

- As for the second and third stages, the warning buzzer sounds for 3 seconds at maximum.
- As for the fourth stage, the warning buzzer does not stop even after a lapse of 3 seconds.
- Buzzer stops when the vehicle moves away from an obstacle and the warning level decreases.

Fail-Safe

INFOID:000000007463578

The warning buzzer function is deactivated and the cancel switch indicator blinks when a sensor system error is detected.



DIAGNOSIS SYSTEM (SONAR CONTROL UNIT)

< SYSTEM DESCRIPTION >

DIAGNOSIS SYSTEM (SONAR CONTROL UNIT)

CONSULT Function

INFOID:000000007463579

DESCRIPTION

CONSULT can display each diagnostic item, using the diagnostic test modes shown below:

Test mode	Function
Ecu Identification	Sonar control unit part number can be read.
Self Diagnostic Results	Sonar control unit checks the conditions and displays memorized error.
Data Monitor	Sonar control unit input/output data in real time.
Active Test	Gives a drive signal to a load to check the operation.
Work support	Changes setting of each function.

ECU IDENTIFICATION

Displays the part number of the sonar control unit.

SELF-DIAGNOSTIC RESULTS

For details, refer to [SN-16, "DTC Index"](#).

DATA MONITOR

Monitor Item	Display	Description
REAR BUZZER	On	Buzzer output condition.
	Off	Buzzer non-output condition.
REVERSE RANGE	On	Shift the selector lever to R position.
	Off	Shift the selector lever other than R position.
CANCEL SW	On	While pressing the sonar cancel switch.
	Off	Other than above.
CANCEL SW IND	On	When sonar cancel switch indicator lamp is ON.
	Blink	When sonar cancel switch indicator lamp is blinking.
	Off	When sonar cancel switch indicator lamp is OFF.
CR SEN [RL] CR SEN [RR]	ERROR	When a sensor is abnormal.
	LV.0	When a sensor is not detection.
	LV.2	The distance between the center sensor and an obstacle is 50 cm (19.6 in) or more and less than 60 cm (23.6 in).
	LV.3	The distance between the center sensor and an obstacle is 30 cm (11.8 in) or more and less than 50 cm (19.6 in).
	LV.4	The distance between center sensor and an obstacle less than 30 cm (11.8 in).
CTR SEN [RL] CTR SEN [RR]	ERROR	When a sensor is abnormal.
	LV.0	When a sensor is not detection.
	LV.1	The distance between the center sensor and an obstacle is 60 cm (23.6 in) or more and less than 100 cm (39.3 in).
	LV.2	The distance between the center sensor and an obstacle is 50 cm (19.6 in) or more and less than 60 cm (23.6 in).
	LV.3	The distance between the center sensor and an obstacle is 30 cm (11.8 in) or more and less than 50 cm (19.6 in).
	LV.4	The distance between center sensor and an obstacle less than 30 cm (11.8 in).
DISPLAY INFO	On	Icon display indication condition.
	Off	Icon display non-indication condition.

DIAGNOSIS SYSTEM (SONAR CONTROL UNIT)

< SYSTEM DESCRIPTION >

ACTIVE TEST

Active test item	Function
BUZZER	This test is able to check buzzer operation.
CANCEL SW	This test is able to check cancel indicator lamp operation.
SONAR SENSOR	This test is able to check each sonar sensor operation.

WORK SUPPORT

Work support item	Function
CORNER SEN DISTANCE SET	Corner sensor warning buzzer distance is adjustable to 4 phases.
CENTER SEN DISTANCE SET	Center sensor warning buzzer distance is adjustable to 4 phases.
VOLUME SETTING*	Warning buzzer volume can set it 2 phases.
TRAILER HITCH MODE	Center sensor (RR, RL) only is adjustable not to detect the distance less than 40 cm (15.7 in). NOTE: This adjustment is for preventing to miss detect the distance when installing the trailer hitch.

*: Without navigation models

CORNER SEN DISTANCE SET

Corner sensor warning buzzer distance can set it to 4 phases as follows.

Warning item	FARTHER	FAR	NORMAL (Default)	NEAR
Second stage warning	70 – 80 cm (27.5 – 31.4 in)	60 – 70 cm (23.6 – 27.5 in)	50 – 60 cm (19.6 – 23.6 in)	40 – 50 cm (15.7 – 19.6 in)
Third stage warning	50 – 70 cm (19.6 – 27.5 in)	40 – 60 cm (15.7 – 23.6 in)	30 – 50 cm (11.8 – 19.6 in)	30 – 40 cm (11.8 – 15.7 in)
Fourth stage warning	Less than 50 cm (19.6 in)	Less than 40 cm (15.7 in)	Less than 30 cm (11.8 in)	Less than 30 cm (11.8 in)

The default of this model is "NORMAL".

CENTER SEN DISTANCE SET

Center sensor warning buzzer distance can set it to 4 phases as follows.

Warning item	FARTHER	FAR	NORMAL (Default)	NEAR
First stage warning	80 – 120 cm (31.4 – 47.2 in)	70 – 110 cm (27.5 – 43.3 in)	60 – 100 cm (23.6 – 39.3 in)	50 – 90 cm (19.6 – 35.4 in)
Second stage warning	70 – 80 cm (27.5 – 31.4 in)	60 – 70 cm (23.6 – 27.5 in)	50 – 60 cm (19.6 – 23.6 in)	40 – 50 cm (15.7 – 19.6 in)
Third stage warning	50 – 70 cm (19.6 – 27.5 in)	40 – 60 cm (15.7 – 23.6 in)	30 – 50 cm (11.8 – 19.6 in)	30 – 40 cm (11.8 – 15.7 in)
Fourth stage warning	Less than 50 cm (19.6 in)	Less than 40 cm (15.7 in)	Less than 30 cm (11.8 in)	Less than 30 cm (11.8 in)

The default of this model is "NORMAL".

VOLUME SETTING

Warning buzzer volume can set it to 2 phases.

TRAILER HITCH MODE

Center sensor (RR, RL) only is adjustable not to detect the distance less than 40 cm (15.7 in).

When installing the trailer hitch : ON

When not installing the trailer hitch : OFF

SONAR CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

ECU DIAGNOSIS INFORMATION

SONAR CONTROL UNIT

Reference Value

INFOID:000000007463580

VALUES ON THE DIAGNOSIS TOOL

CONSULT MONITOR ITEM

Monitor Item	Condition		Value/Status
REAR BUZZER	Ignition switch ON	Buzzer output condition.	On
		Buzzer non-output condition.	Off
REVERSE RANGE	Ignition switch ON	Selector lever in reverse position.	On
		Other than selector lever in reverse position.	Off
CANCEL SW	Ignition switch ON	While pressing the sonar cancel switch.	On
		Other than above.	Off
CANCEL SW IND	Ignition switch ON	When sonar cancel switch indicator lamp is ON.	On
		When sonar cancel switch indicator lamp is blinking.	Blink
		When sonar cancel switch indicator lamp is OFF.	Off
CR SEN [RL]	Ignition switch ON	When a sensor is abnormal.	ERROR
		When a sensor is not detection.	LV.0
		The distance between the corner sensor and an obstacle is 50 cm (19.6 in) or more and less then 60 cm (23.6 in).	LV.2
		The distance between the corner sensor and an obstacle is 30 cm (11.8 in) or more and less then 50 cm (19.6 in).	LV.3
		The distance between corner sensor and an obstacle less than 30 cm (11.8 in).	LV.4
CR SEN [RR]	Ignition switch ON	When a sensor is abnormal.	ERROR
		When a sensor is not detection.	LV.0
		The distance between the corner sensor and an obstacle is 50 cm (19.6 in) or more and less then 60 cm (23.6 in).	LV.2
		The distance between the corner sensor and an obstacle is 30 cm (11.8 in) or more and less then 50 cm (19.6 in).	LV.3
		The distance between corner sensor and an obstacle less than 30 cm (11.8 in).	LV.4
CTR SEN [RL]	Ignition switch ON	When a sensor is abnormal.	ERROR
		When a sensor is not detection.	LV.0
		The distance between the center sensor and an obstacle is 60 cm (23.6 in) or more and less then 100 cm (39.3 in).	LV.1
		The distance between the center sensor and an obstacle is 50 cm (19.6 in) or more and less then 60 cm (23.6 in).	LV.2
		The distance between the center sensor and an obstacle is 30 cm (11.8 in) or more and less then 50 cm (19.6 in).	LV.3
		The distance between center sensor and an obstacle less than 30 cm (11.8 in).	LV.4

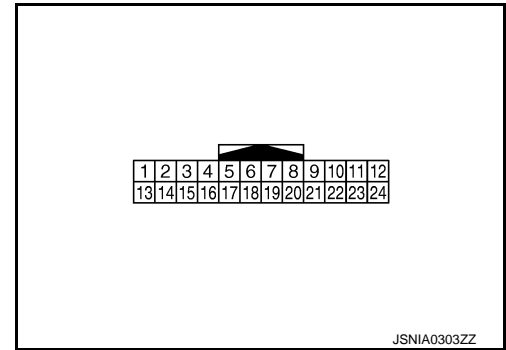
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SONAR CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

Monitor Item	Condition		Value/Status
CTR SEN [RR]	Ignition switch ON	When a sensor is abnormal.	ERROR
		When a sensor is not detection.	LV.0
		The distance between the center sensor and an obstacle is 60 cm (23.6 in) or more and less then 100 cm (39.3 in).	LV.1
		The distance between the center sensor and an obstacle is 50 cm (19.6 in) or more and less then 60 cm (23.6 in).	LV.2
		The distance between the center sensor and an obstacle is 30 cm (11.8 in) or more and less then 50 cm (19.6 in).	LV.3
		The distance between center sensor and an obstacle less than 30 cm (11.8 in).	LV.4
DISPLAY INFO	Ignition switch ON	Icon display indication condition.	On
		Icon display non-indication condition.	Off

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	-	Signal name	Input/ Output			
1 (LG)	Ground	Ignition signal	Input	Ignition switch ON	—	12.0 V
2 (SB)	Ground	Sonar cancel switch signal	Input	Ignition switch ON	Turns ON while pressing sonar cancel switch ON.	2.0 V
					Other than while pressing sonar cancel switch ON.	12.0 V
5 (W)	12 (B)	Corner sensor signal rear LH	Input	Ignition switch ON	Shift position in reverse position.	
6 (Y)	12 (B)	Corner sensor signal rear RH	Input	Ignition switch ON	Selector lever in reverse position.	

SONAR CONTROL UNIT

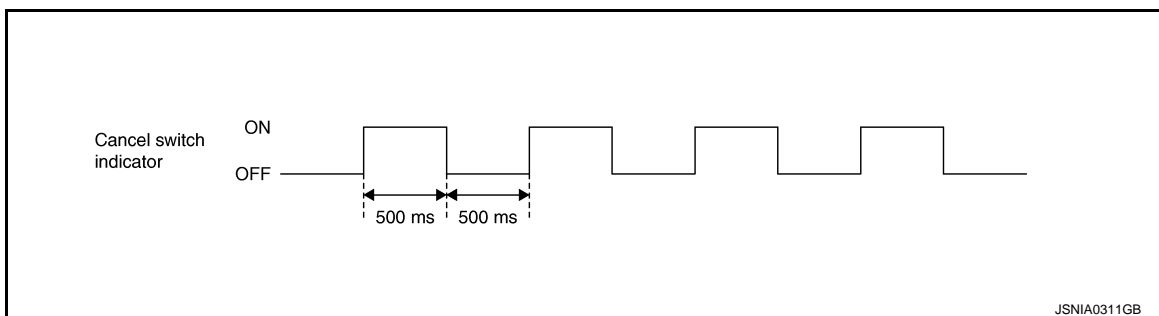
< ECU DIAGNOSIS INFORMATION >

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	-	Signal name	Input/ Output			
7 (G)	12 (B)	Center sensor signal rear LH	Input	Ignition switch ON	Selector lever in R position.	
8 (R)	12 (B)	Center sensor signal rear RH	Input	Ignition switch ON	Selector lever in R position.	
11 (B)	Ground	Sonar cancel switch indicator signal	Output	Ignition switch ON	Sonar system ON	12.0 V
					Sonar system OFF	0 V
13 (GR)	Ground	ACC power supply	Input	Ignition switch ACC	—	Battery voltage
17 (BG)	Ground	Reverse range signal	Input	Ignition switch ON	Shift position in R position.	12.0 V
					Other than shift position in R position.	0 V
18 (V)	—	K-line (CONSULT)	—	—	—	—
19 (SB)	—	AV communication signal (H)	Input/ Output	—	—	—
20 (LG)	—	AV communication signal (L)	Input/ Output	—	—	—
24 (B)	Ground	Ground	—	Ignition switch ON	—	0 V

Fail-Safe

INFOID:000000007463581

The warning buzzer function is deactivated and the cancel switch indicator blinks when a sensor system error is detected.



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SONAR CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

DTC Index

INFOID:000000007463582

DTC	Display item [Code]	Malfunction is detected when...	Reference
B2704	CORNER SENSOR [RL] [B2704]	Corner sensor rear LH is malfunctioning.	SN-23
B2705	SENSOR HARNESS OPEN [CR-RL] [B2705]	Corner sensor rear LH harness circuit is open.	SN-24
B2706	CORNER SENSOR [RR] [B2706]	Corner sensor rear RH is malfunctioning.	SN-25
B2707	SENSOR HARNESS OPEN [CR-RR] [B2707]	Corner sensor rear RH harness circuit is open.	SN-26
B2708	CENTER SENSOR [BL] [B2708]	Center sensor rear LH is malfunctioning.	SN-27
B2709	SENSOR HARNESS OPEN [CT-BL] [B2709]	Center sensor rear LH harness circuit is open.	SN-28
B270A	CENTER SENSOR [BR] [B270A]	Center sensor rear RH is malfunctioning.	SN-29
B270B	SENSOR HARNESS OPEN [CT-BR] [B270B]	Center sensor rear RH harness circuit is open.	SN-30

NOTE:

“TIME” means the following.

- 0: Means detected malfunction at present. (From malfunction detection to turning ignition switch OFF)
- 1–39: Means detected malfunction in past.

SONAR SYSTEM

< WIRING DIAGRAM >


WIRING DIAGRAM

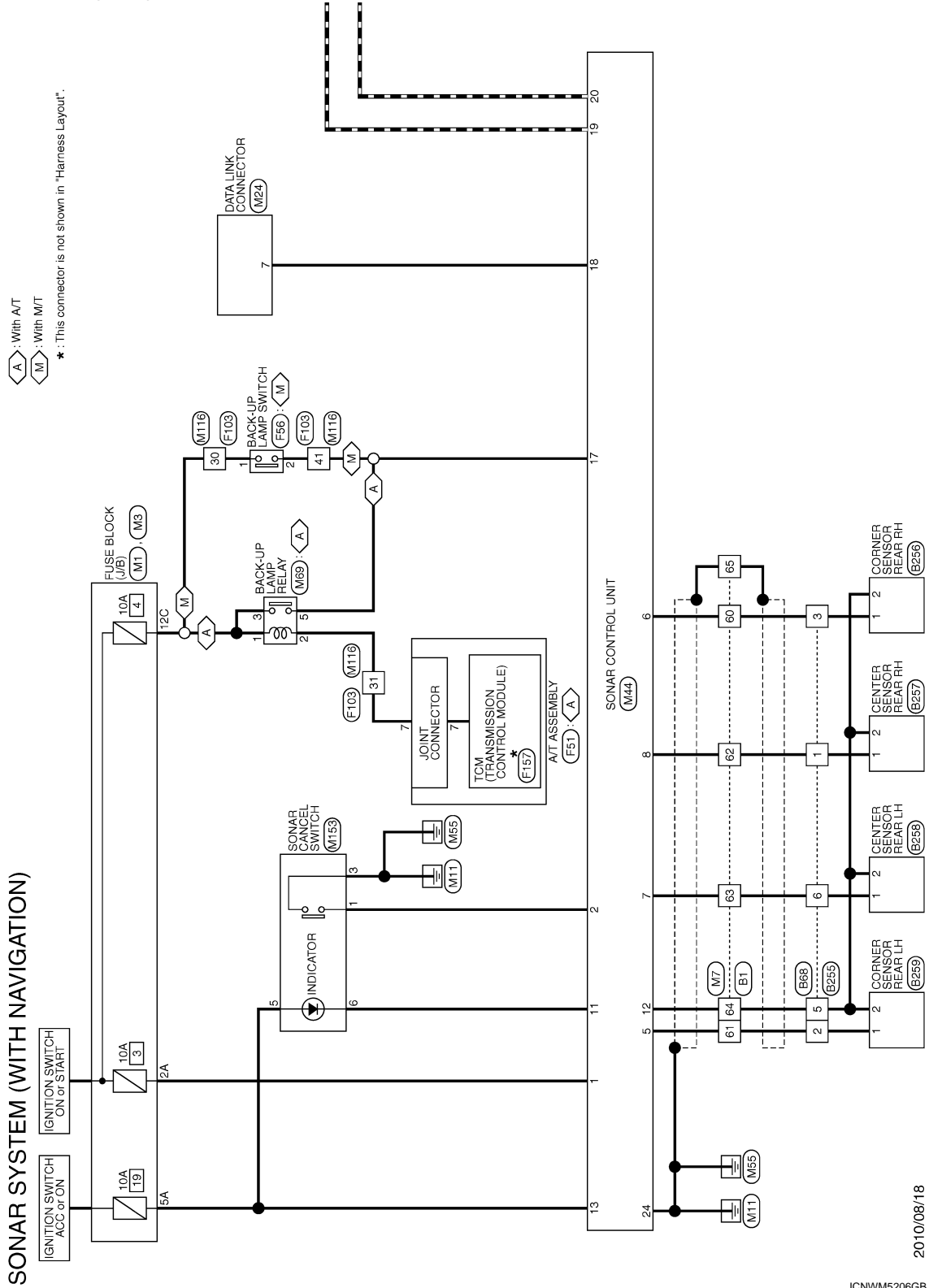
SONAR SYSTEM

Wiring Diagram

INFOID:000000007463583

WITH NAVIGATION

For connector terminal arrangements, harness layouts, and alphabets in a  (option abbreviation; if not described in wiring diagram), refer to [GI-12, "Connector Information"](#).



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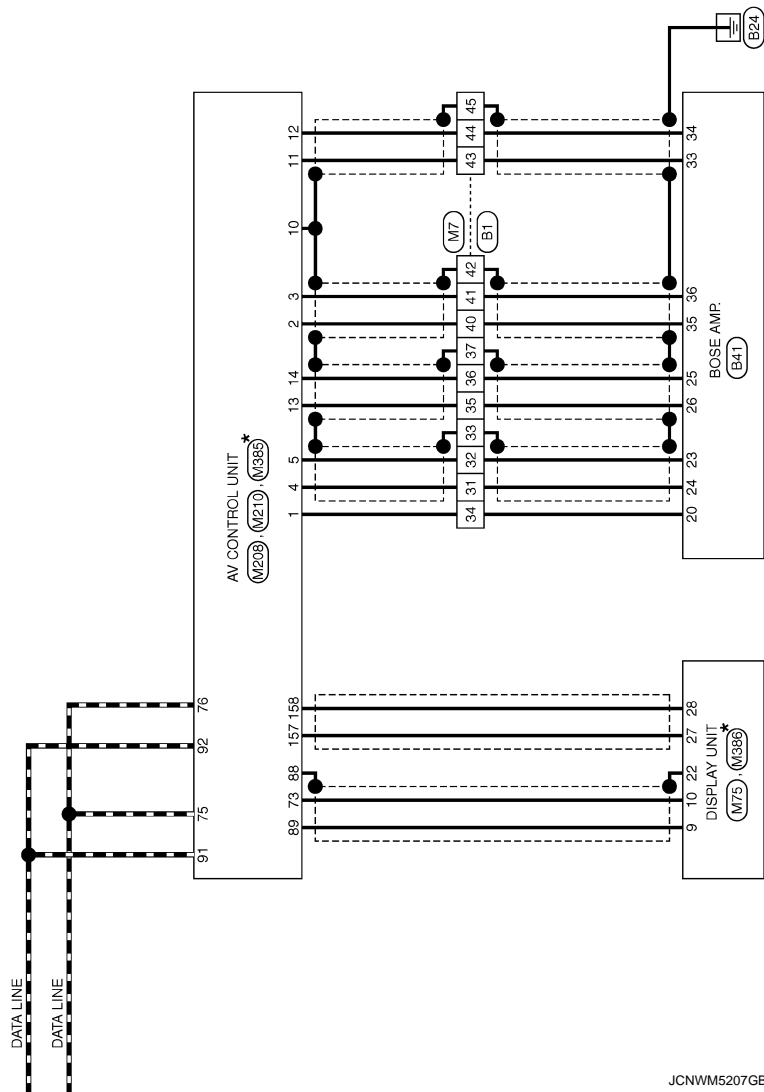
2010/08/18

JCNWM5206GB

SONAR SYSTEM

< WIRING DIAGRAM >

*: This connector is not shown in "Harness Layout".




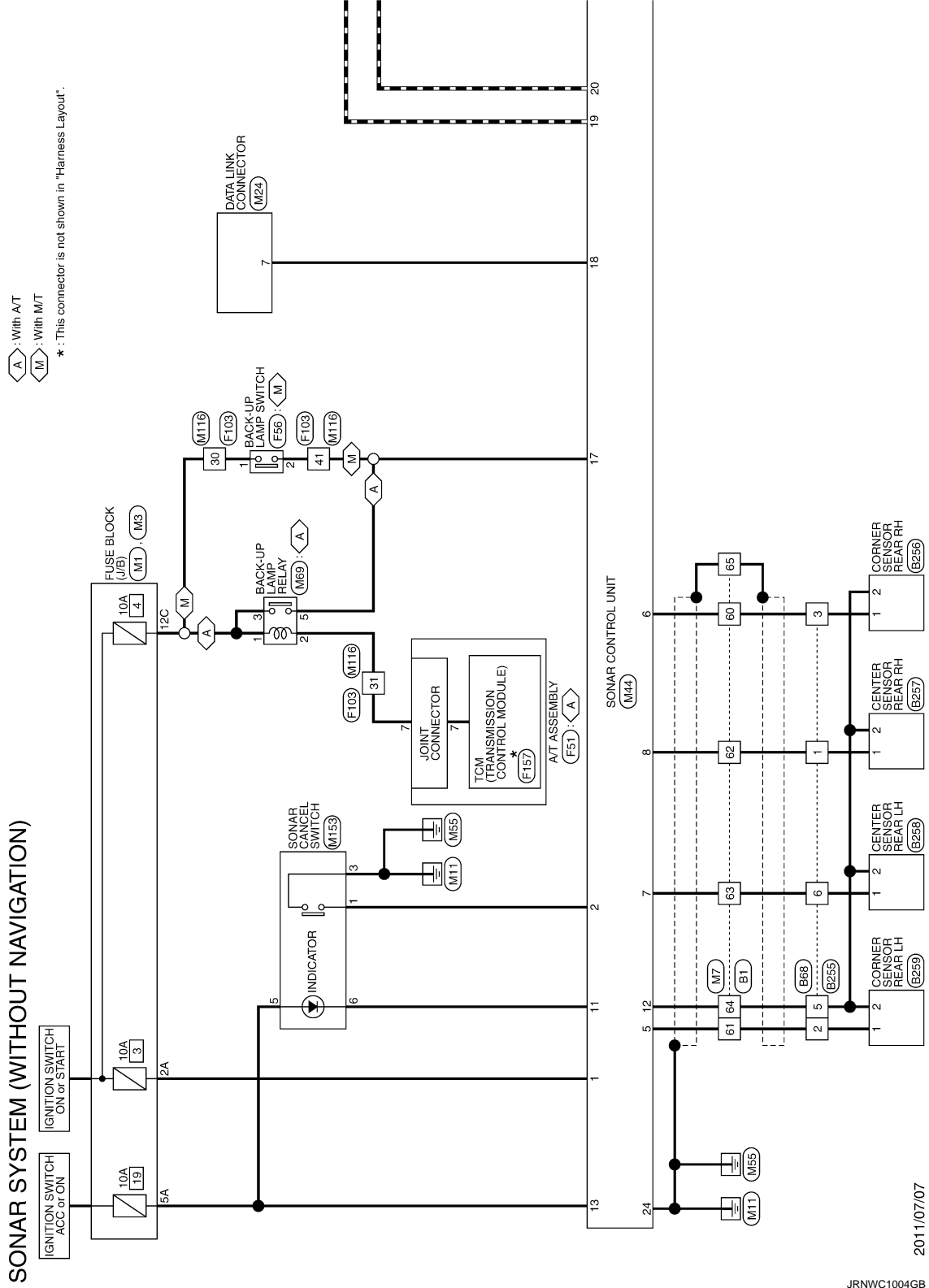
JCNWM5207GB

WITHOUT NAVIGATION

SONAR SYSTEM

< WIRING DIAGRAM >

For connector terminal arrangements, harness layouts, and alphabets in a  (option abbreviation; if not described in wiring diagram), refer to [GI-12, "Connector Information"](#).



2011/07/07

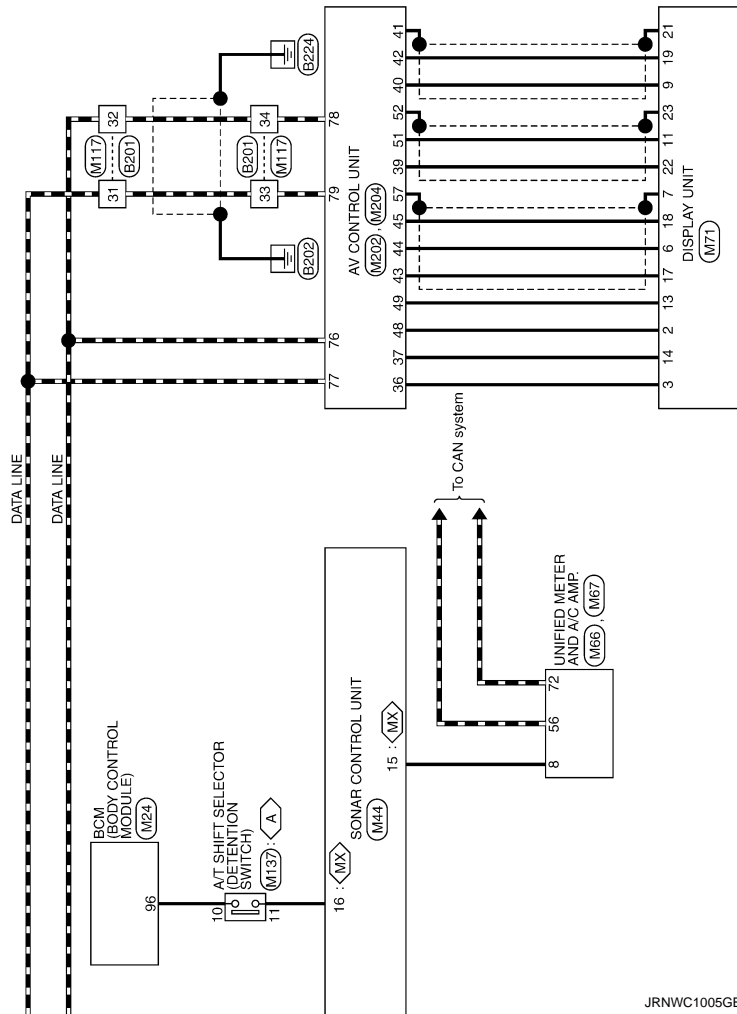
JRNWC1004GB

SN

SONAR SYSTEM

< WIRING DIAGRAM >

MX : For Mexico
A : With A/T



JRNWC1005GB

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

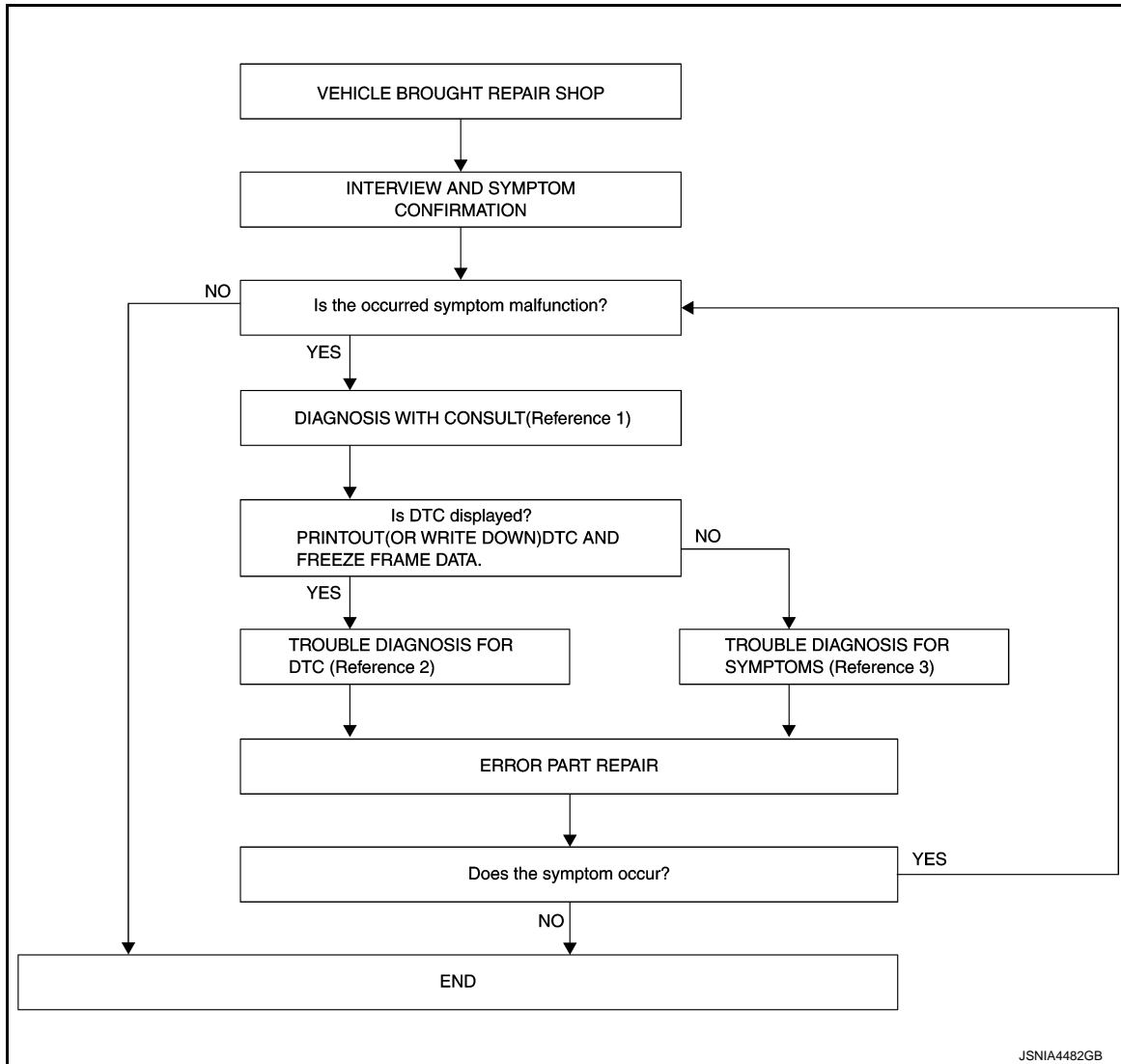
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000007463584

OVERALL SEQUENCE



- Reference 1... Refer to [SN-11. "CONSULT Function"](#).
- Reference 2... Refer to [SN-16. "DTC Index"](#).
- Reference 3... Refer to [SN-35. "Symptom Table"](#).

DETAILED FLOW

1. INTERVIEW AND SYMPTOM CONFIRMATION

Check the malfunction symptoms by performing the following items.

- Interview the customer to obtain the malfunction information (conditions and environment when the malfunction occurred).
- Check if mud, or other foreign objects are not adhering to the sonar sensor.
- Check if there is no deformation, scratches, or other damage to the sonar sensor.
- Check if water has not accumulated in the sonar sensor.
- Check the symptom.

Is the occurred symptom malfunction?

YES >> GO TO 2.

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

NO >> INSPECTION END

2. DIAGNOSIS WITH CONSULT

1. Connect CONSULT and perform a self-diagnosis for "SONAR". Refer to [SN-11, "CONSULT Function"](#).
2. When DTC is detected, follow the instructions below:
 - Record DTC and Freeze Frame Data.

Is DTC displayed?

YES >> GO TO 3.

NO >> GO TO 4.

3. TROUBLE DIAGNOSIS FOR DTC

1. Check the DTC indicated in the self-diagnosis results.
2. Perform the relevant diagnosis referring to the DTC Index. Refer to [SN-16, "DTC Index"](#).

>> GO TO 5.

4. TROUBLE DIAGNOSIS FOR SYMPTOMS

Perform the relevant diagnosis referring to the diagnosis chart by symptom. Refer to [SN-35, "Symptom Table"](#).

>> GO TO 5.

5. ERROR PART REPAIR

1. Repair or replace the identified malfunctioning parts.
2. Perform a self-diagnosis for "SONAR" with CONSULT.
3. Check that the symptom does not occur.

Does the symptom occur?

YES >> GO TO 1.

NO >> INSPECTION END

B2704 CORNER SENSOR [RL]

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS

B2704 CORNER SENSOR [RL]

Description

INFOID:000000007463585

Component	Description
CORNER/CENTER SENSOR	The obstacle distance is detected. The signal is transmitted to the sonar control unit.

DTC Logic

INFOID:000000007463586

DTC DETECTION LOGIC

DTC No.	CONSULT indication	DTC detection condition	Troubleshooting
B2704	CORNER SENSOR [RL] [B2704]	Corner sensor rear LH is malfunctioning.	Replace corner sensor rear LH Refer to SN-38, "Removal and Installation"

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B2705 SENSOR HARNESS OPEN [CR-RL]

< DTC/CIRCUIT DIAGNOSIS >

B2705 SENSOR HARNESS OPEN [CR-RL]

Description

INFOID:000000007463587

Component	Description
CORNER/CENTER SENSOR	The obstacle distance is detected. The signal is transmitted to the sonar control unit.

DTC Logic

INFOID:000000007463588

DTC DETECTION LOGIC

DTC No.	CONSULT indication	DTC detection condition	Troubleshooting
B2705	SENSOR HARNESS OPEN [CR-RL] [B2705]	Corner sensor rear LH harness circuit is open.	Check corner sensor rear LH circuit

Diagnosis Procedure

INFOID:000000007463589

1. CHECK HARNESS CORNER SENSOR REAR LH SIGNAL CIRCUIT

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	
M44	5	B259	1	Existed

4. Check continuity between sonar control unit harness connector and ground.

Sonar control unit		Ground	Continuity
Connector	Terminal		
M44	5		Not existed

Is the inspection result normal?

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

2. CHECK HARNESS CORNER SENSOR REAR LH GROUND CIRCUIT

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	
M44	12	B259	2	Existed

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Repair harness or connector.

B2706 CORNER SENSOR [RR]

< DTC/CIRCUIT DIAGNOSIS >

B2706 CORNER SENSOR [RR]

Description

INFOID:000000007463590

Component	Description
CORNER/CENTER SENSOR	The obstacle distance is detected. The signal is transmitted to the sonar control unit.

DTC Logic

INFOID:000000007463591

DTC DETECTION LOGIC

DTC No.	CONSULT indication	DTC detection condition	Troubleshooting
B2706	CORNER SENSOR [RR] [B2706]	Corner sensor rear RH is malfunctioning.	Replace corner sensor rear RH Refer to SN-38. "Removal and Installation"

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B2707 SENSOR HARNESS OPEN [CR-RR]

< DTC/CIRCUIT DIAGNOSIS >

B2707 SENSOR HARNESS OPEN [CR-RR]

Description

INFOID:000000007463592

Component	Description
CORNER/CENTER SENSOR	The obstacle distance is detected. The signal is transmitted to the sonar control unit.

DTC Logic

INFOID:000000007463593

DTC DETECTION LOGIC

DTC No.	CONSULT indication	DTC detection condition	Troubleshooting
B2707	SENSOR HARNESS OPEN [CR-RR] [B2707]	Corner sensor rear RH harness circuit is open.	Check corner sensor rear RH circuit

Diagnosis Procedure

INFOID:000000007463594

1. CHECK HARNESS CORNER SENSOR REAR RH SIGNAL CIRCUIT

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	
M44	6	B256	1	Existed

4. Check continuity between sonar control unit harness connector and ground.

Sonar control unit		Ground	Continuity
Connector	Terminal		
M44	6		Not existed

Is the inspection result normal?

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

2. CHECK HARNESS CORNER SENSOR REAR RH GROUND CIRCUIT

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	
M44	12	B256	2	Existed

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Repair harness or connector.

B2708 CENTER SENSOR [BL]

< DTC/CIRCUIT DIAGNOSIS >

B2708 CENTER SENSOR [BL]

Description

INFOID:000000007463595

Component	Description
CORNER/CENTER SENSOR	The obstacle distance is detected. The signal is transmitted to the sonar control unit.

DTC Logic

INFOID:000000007463596

DTC DETECTION LOGIC

DTC No.	CONSULT indication	DTC detection condition	Troubleshooting
B2708	CENTER SENSOR [BL] [B2708]	Center sensor rear LH is malfunctioning.	Replace center sensor rear LH Refer to SN-38. "Removal and Installation"

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B2709 SENSOR HARNESS OPEN [CT-BL]

< DTC/CIRCUIT DIAGNOSIS >

B2709 SENSOR HARNESS OPEN [CT-BL]

Description

INFOID:000000007463597

Component	Description
CORNER/CENTER SENSOR	The obstacle distance is detected. The signal is transmitted to the sonar control unit.

DTC Logic

INFOID:000000007463598

DTC DETECTION LOGIC

DTC No.	CONSULT indication	DTC detection condition	Troubleshooting
B2709	SENSOR HARNESS OPEN [CT-BL] [B2709]	Center sensor rear LH harness circuit is open.	Check center sensor rear LH circuit

Diagnosis Procedure

INFOID:000000007463599

1. CHECK HARNESS CENTER SENSOR REAR LH SIGNAL CIRCUIT

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	
M44	7	B258	1	Existed

4. Check continuity between sonar control unit harness connector and ground.

Sonar control unit		Ground	Continuity
Connector	Terminal		
M44	7		Not existed

Is the inspection result normal?

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

2. CHECK HARNESS CENTER SENSOR REAR LH GROUND CIRCUIT

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	
M44	12	B258	2	Existed

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Repair harness or connector.

B270A CENTER SENSOR [BR]

< DTC/CIRCUIT DIAGNOSIS >

B270A CENTER SENSOR [BR]

Description

INFOID:000000007463600

Component	Description
CORNER/CENTER SENSOR	The obstacle distance is detected. The signal is transmitted to the sonar control unit.

DTC Logic

INFOID:000000007463601

DTC DETECTION LOGIC

DTC No.	CONSULT indication	DTC detection condition	Troubleshooting
B270A	CENTER SENSOR [BR] [B270A]	Center sensor rear RH is malfunctioning.	Replace center sensor rear RH Refer to SN-38. "Removal and Installation"

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B270B SENSOR HARNESS OPEN [CT-BR]

< DTC/CIRCUIT DIAGNOSIS >

B270B SENSOR HARNESS OPEN [CT-BR]

Description

INFOID:000000007463602

Component	Description
CORNER/CENTER SENSOR	The obstacle distance is detected. The signal is transmitted to the sonar control unit.

DTC Logic

INFOID:000000007463603

DTC DETECTION LOGIC

DTC No.	CONSULT indication	DTC detection condition	Troubleshooting
B270B	SENSOR HARNESS OPEN [CT-BR] [B270B]	Center sensor rear RH harness circuit is open.	Check center sensor rear RH circuit

Diagnosis Procedure

INFOID:000000007463604

1. CHECK HARNESS CENTER SENSOR REAR RH SIGNAL CIRCUIT

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	
M44	8	B257	1	Existed

4. Check continuity between sonar control unit harness connector and ground.

Sonar control unit		Ground	Continuity
Connector	Terminal		
M44	8		Not existed

Is the inspection result normal?

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

2. CHECK HARNESS CENTER SENSOR REAR RH GROUND CIRCUIT

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	
M44	12	B257	2	Existed

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Repair harness or connector.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

POWER SUPPLY AND GROUND CIRCUIT SONAR CONTROL UNIT

SONAR CONTROL UNIT : Diagnosis Procedure

INFOID:000000007463605

1. CHECK FUSE

Check for blown fuses.

Power source	Fuse No.
Ignition switch ACC or ON	19
Ignition switch ON or START	3

Is the inspection result normal?

YES >> GO TO 2.

NO >> Be sure to eliminate cause of malfunction before installing new fuse.

2. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between sonar control unit harness connector and ground.

Signal name	Connector No.	Terminal No.	Ignition switch position	Value (Approx.)
Battery power supply	M44	13	OFF	Battery voltage
Ignition signal	M44	1	ON	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace sonar control unit power supply harness.

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector.
3. Check continuity between sonar control unit harness connector and ground.

Sonar control unit		Ground	Continuity
Connector	Terminal		
M44	24		Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace sonar control unit ground harness.

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R RANGE SIGNAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

R RANGE SIGNAL CIRCUIT

Description

INFOID:000000007463606

The sonar control unit turns the sonar system activation OFF when inputting the reverse signal.

Component Function Check

INFOID:000000007463607

1. SONAR CONTROL UNIT DATA MONITOR INSPECTION

Check "REVERSE RANGE" with "DATA MONITOR" of "SONAR".

REVERSE RANGE

Vehicle condition	Indication
Shift position in R position	: On
Other than shift position in R position	: Off

>> INSPECTION END

Diagnosis Procedure

INFOID:000000007463608

1. CHECK P RANGE SIGNAL

1. Turn ignition switch ON.
2. Check voltage between sonar control unit harness connector and ground.

(+) Sonar control unit		(-)	Condition	Voltage (Approx.)
Connector	Terminal			
M44	17	Ground	Shift position in R position.	12.0 V
			Other than shift position in R position.	0 V

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Repair harness or connector.

SONAR CANCEL SWITCH CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

SONAR CANCEL SWITCH CIRCUIT

Description

INFOID:000000007463609

The sonar control unit turns the sonar system activation OFF when inputting the cancel switch signal.

Component Function Check

INFOID:000000007463610

1. SONAR CONTROL UNIT DATA MONITOR INSPECTION

Check "CANCEL SW" with "DATA MONITOR" of "SONAR".

Cancel switch

Vehicle condition	Indication
While pressing the sonar cancel switch	: On
Other than above	: Off

>> INSPECTION END

Diagnosis Procedure

INFOID:000000007463611

1. CHECK HARNESS CANCEL SWITCH SIGNAL CIRCUIT

1. Disconnect sonar control unit connector and cancel switch connector.
2. Check continuity between sonar control unit harness connector and cancel switch harness connector.

Sonar control unit		Cancel switch		Continuity
Connector	Terminal	Connector	Terminal	
M44	2	M153	1	Existed

3. Check continuity between sonar control unit harness connector and ground.

Sonar control unit		Ground	Continuity
Connector	Terminal		
M44	2		Not existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair harness or connector.

2. CHECK VOLTAGE SONAR CONTROL UNIT

1. Connect sonar control unit connector.
2. Turn ignition switch ON.
3. Check voltage between sonar control unit harness connector and ground.

(+)		(-)	Voltage (Approx.)
Connector	Terminal		
M44	2	Ground	12.0 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace sonar control unit. Refer to [SN-37, "Removal and Installation"](#).

3. CHECK CANCEL SWITCH

1. Turn ignition switch OFF.
2. Check sonar cancel switch function. Refer to [SN-33, "Component Function Check"](#).

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SONAR CANCEL SWITCH CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace sonar cancel switch. Refer to [SN-39. "Removal and Installation"](#).

4. CHECK HARNESS CANCEL SWITCH GROUND CIRCUIT

1. Turn ignition switch ON.
2. Check continuity between cancel switch harness connector and ground.

Cancel switch		Ground	Continuity
Connector	Terminal		
M153	3		Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair harness or connector.

SONAR SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

SONAR SYSTEM SYMPTOMS

Symptom Table

INFOID:000000007463612

Symptom	Check item	Diagnosis method
All sonar sensors do not activate.	"SONAR" is indicated on "SELECT SYSTEM" screen after connection CONSULT.	<ul style="list-style-type: none"> Perform "Self Diagnostic Result" of "SONAR" with CONSULT. Refer to SN-11, "CONSULT Function". Perform the on board diagnosis of MULTI AV. Refer to AV-213, "On Board Diagnosis Function" (BOSE audio without navigation) or AV-336, "On Board Diagnosis Function" (BOSE audio with navigation). Check reverse signal for sonar control unit. Refer to SN-32, "Diagnosis Procedure".
	"SONAR" is not indicated on "SELECT SYSTEM" screen after connection CONSULT.	Check sonar control unit power supply and ground circuit. Refer to SN-31, "SONAR CONTROL UNIT : Diagnosis Procedure" .
Any sonar sensor does not activate.	—	Perform "Self Diagnostic Result" of "SONAR" with CONSULT. Refer to SN-11, "CONSULT Function" .
Sonar indicator is not displayed by display unit.	—	Perform the on board diagnosis of MULTI AV. Refer to AV-213, "On Board Diagnosis Function" (BOSE audio without navigation) or AV-336, "On Board Diagnosis Function" (BOSE audio with navigation).

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NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Symptom Table

INFOID:000000009336409

Symptom	Possible cause
Unstable object detection	<ul style="list-style-type: none">• The vehicle is on a rough surface, such as stone or gravel.• When used in poor weather conditions, such as heavy snow/rain or strong wind.• When subjected to an ultrasonic noise generated from exhaust muffler or brakes.• When left standing in the hot sun or in a cold climate.• When the surface of the sensor is frozen or covered with snow/dirt/moisture.• When a retrofitted xenon lamp, lighted license plate, or harness is close to the sensor body or sensor harness.• When subjected to loop coil noises generated from a vehicle detector placed at an intersection or coin parking area.
Object undetectable	<ul style="list-style-type: none">• Air-containing objects, such as cloth, cotton, glass wool, dust, and snow.• Thin objects, such as rope, chain, and wire.• Smooth-faced objects placed in a slanting direction.• Fast-moving small animals.• A corner of an angular object. <p>NOTE: If the sensor detection part is scratched, obstacles cannot be detected.</p>

SONAR CONTROL UNIT

< REMOVAL AND INSTALLATION >

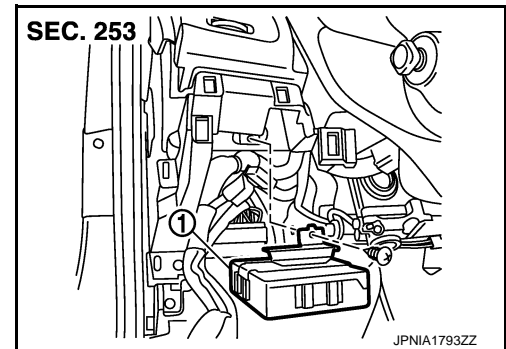
REMOVAL AND INSTALLATION

SONAR CONTROL UNIT

Exploded View

INFOID:000000007463613

1. Sonar control unit



Removal and Installation

INFOID:000000007463614

REMOVAL

1. Remove the instrument finisher A. Refer to [IP-12, "A/T MODELS : Removal and Installation"](#) (A/T models) or [IP-23, "M/T MODELS : Removal and Installation"](#) (M/T models).
2. Remove sonar control unit screw, then disconnect sonar control unit connector and remove the sonar control unit.

INSTALLATION

Install in the reverse order of removal.

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SONAR SENSOR

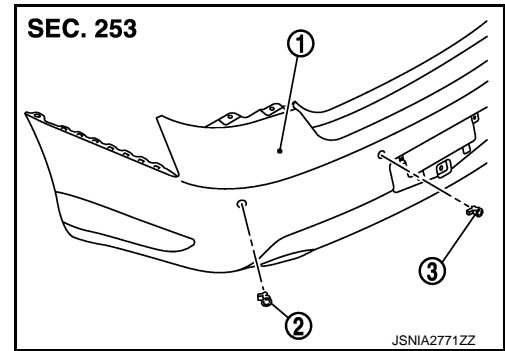
< REMOVAL AND INSTALLATION >

SONAR SENSOR

Exploded View

INFOID:000000007463615

1. Rear bumper
2. Corner sensor rear
3. Center sensor rear



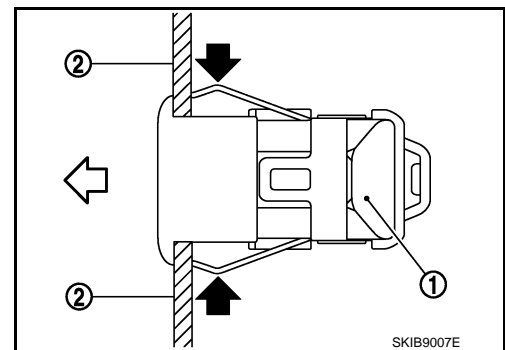
Removal and Installation

INFOID:000000007463616

REMOVAL

1. Remove the rear bumper.
2. Disconnect rear sensor connector.
3. Press the spring fixing the sensor (1) (black arrows).
4. Remove the sensor to the white arrow direction.

2 : rear bumper



INSTALLATION

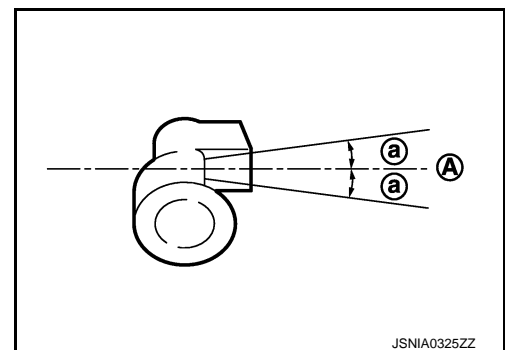
Install in the reverse order of removal.

CAUTION:

The connector direction is within $\pm 10^\circ$ from the horizontal position when assembling the bumper.

A : Horizontal position

a : 10°



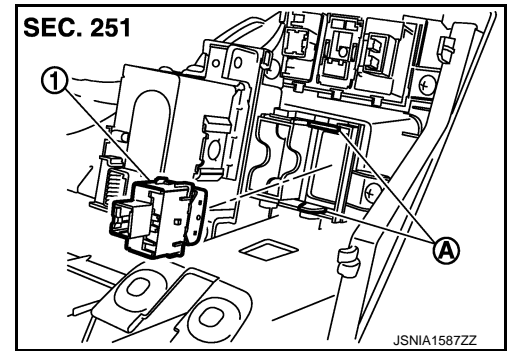
SONAR CANCEL SWITCH

< REMOVAL AND INSTALLATION >

SONAR CANCEL SWITCH

Exploded View

- 1 : Sonar cancel switch
- A : Pawls



INFOID:000000007463617

Removal and Installation

INFOID:000000007463618

REMOVAL

1. Remove the instrument driver lower panel. Refer to [IP-12, "A/T MODELS : Removal and Installation"](#) (A/T models) or [IP-23, "M/T MODELS : Removal and Installation"](#) (M/T models).
2. Disengage the pawls. And then remove sonar cancel switch.

INSTALLATION

Install in the reverse order of removal.

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