

**SECTION SN**  
**SONAR SYSTEM**

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# PRECAUTION

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## PRECAUTION

### PRECAUTION

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

INFOID:000000007071211

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 SR and SB section of this Service Manual.

#### **WARNING:**

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which 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 the SR section.
- Do not 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:**

- When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT 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.

#### Precaution for Work

INFOID:000000007152474

- When removing or disassembling each component, be careful not to damage or deform it. If a component may be subject to interference, be sure to protect it with a shop cloth.
- When removing (disengaging) components with a screwdriver or similar tool, be sure to wrap the component with a shop cloth or vinyl tape to protect it.
- Protect the removed parts with a shop cloth and prevent them from being dropped.
- Replace a deformed or damaged clip.
- If a part is specified as a non-reusable part, always replace it with new one.
- Be sure to tighten bolts and nuts securely to the specified torque.
- After installation is complete, be sure to check that each part works properly.
- Follow the steps below to clean components.
  - Water soluble dirt: Dip a soft cloth into lukewarm water, and wring the water out of the cloth to wipe the dirty area.  
Then rub with a soft and dry cloth.
  - Oily dirt: Dip a soft cloth into lukewarm water with mild detergent (concentration: within 2 to 3%), and wipe the dirty area.  
Then dip a cloth into fresh water, and wring the water out of the cloth to wipe the detergent off. Then rub with a soft and dry cloth.
- Do not use organic solvent such as thinner, benzene, alcohol, or gasoline.
- For genuine leather seats, use a genuine leather seat cleaner.

# PREPARATION

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## PREPARATION

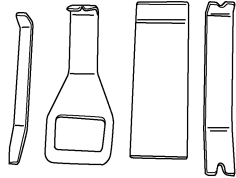
### PREPARATION

#### Special Service Tool

INFOID:000000007838532

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
— (J-46534) Trim tool set	Removing trim components



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# COMPONENT PARTS

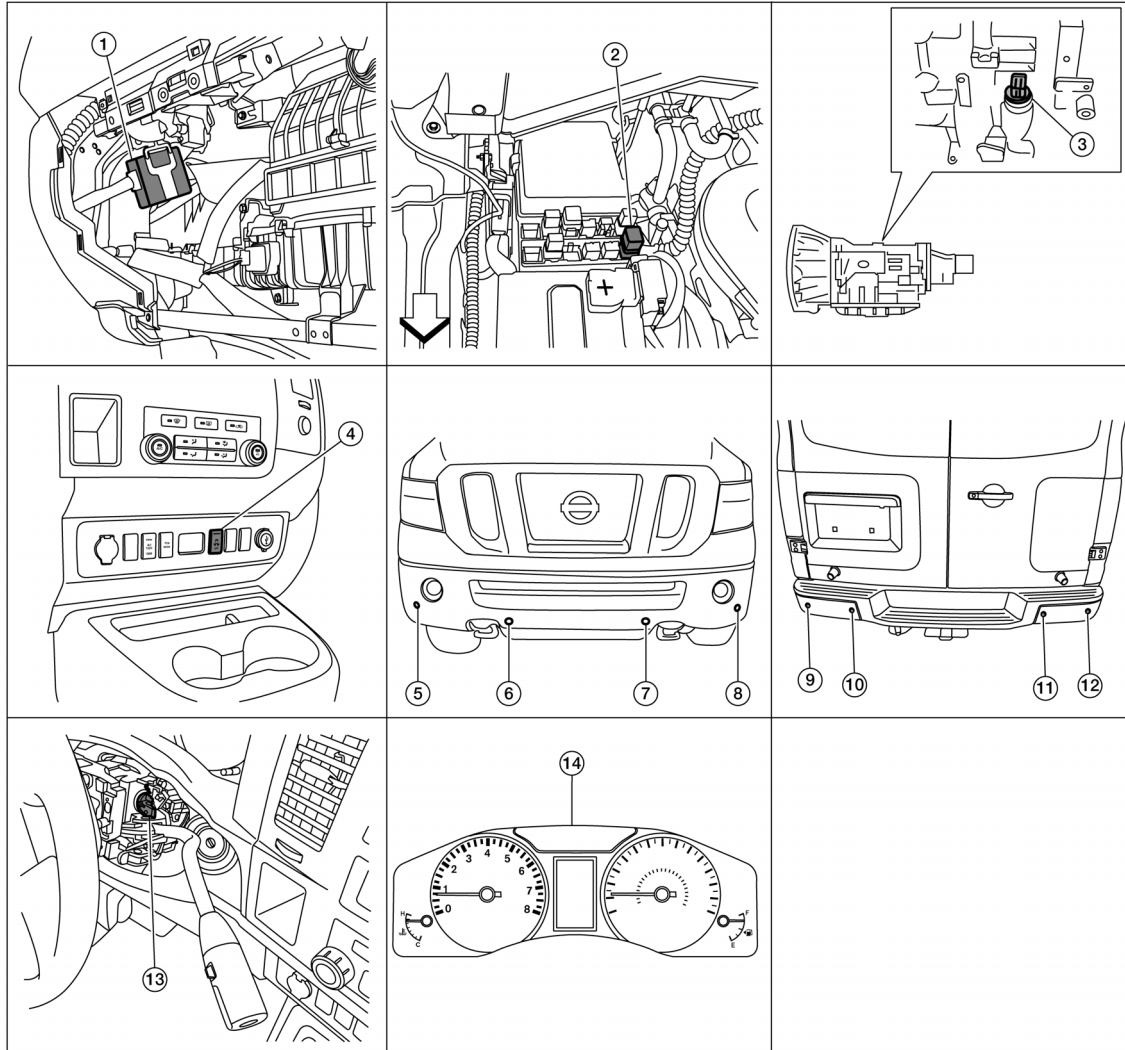
< SYSTEM DESCRIPTION >

## SYSTEM DESCRIPTION

### COMPONENT PARTS

#### Component Parts Location

INFOID:000000007107214



AWNIA25332Z

- |  |                                |                                |
|--|--------------------------------|--------------------------------|
| 1. Sonar control unit<br>(View with glove box removed)               | 2. Back-up lamp relay          | 3. A/T assembly                |
| 4. Sonar system OFF switch<br>(with sonar system OFF indicator)      | 5. Front sonar sensor RH outer | 6. Front sonar sensor RH inner |
| 7. Front sonar sensor LH inner                                       | 8. Front sonar sensor LH outer | 9. Rear sonar sensor LH outer  |
| 10. Rear sonar sensor LH inner                                       | 11. Rear sonar sensor RH inner | 12. Rear sonar sensor RH outer |
| 13. A/T shift selector<br>(View with steering column covers removed) | 14. Combination meter          | ← :Front of vehicle            |

#### Component Description

INFOID:000000007107215

Component	Function
Sonar control unit (with integral sonar buzzer)	<ul style="list-style-type: none"> <li>Controls sonar system and provides self-diagnosis</li> <li>Sounds a signal when objects are detected in the rear of the vehicle</li> </ul>
Back-up lamp relay	Provides reverse signal for sonar control unit

## COMPONENT PARTS

### < SYSTEM DESCRIPTION >

Component	Function	
A/T assembly	Controls back-up lamp relay	A
A/T shift selector	Provides park signal for sonar control unit	
Sonar system OFF switch	Enables the driver to turn the system OFF and signals a system malfunction	B
Front sonar sensors	Senses objects in the front of the vehicle	
Rear sonar sensors	Senses objects in the rear of the vehicle	
Combination meter	Provides vehicle speed signal for sonar control unit	C

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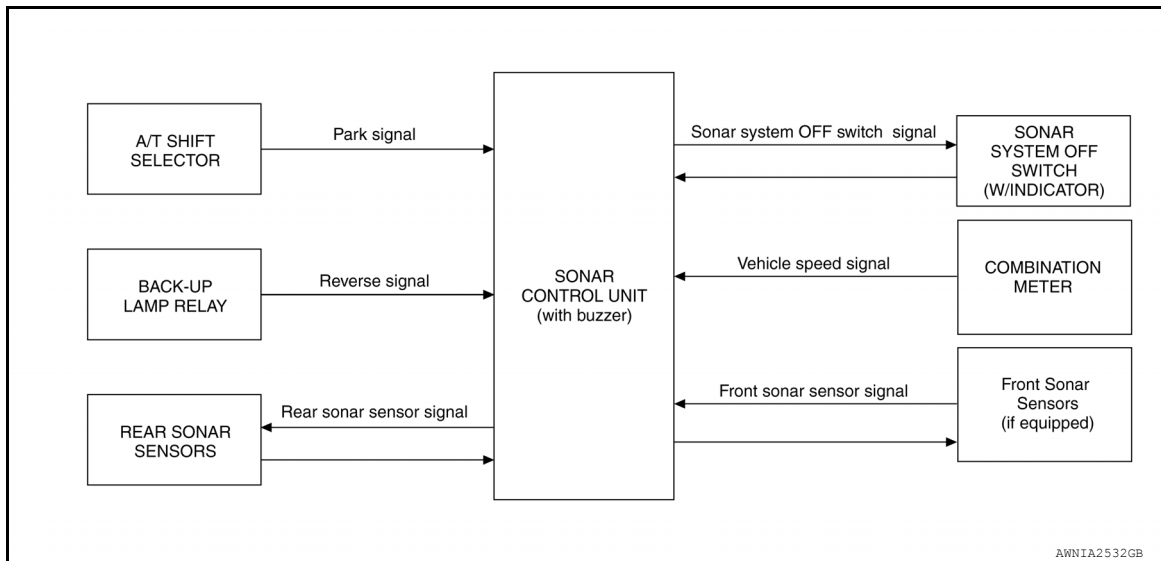
# SYSTEM

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## SYSTEM

### System Diagram

INFOID:000000007071059



### System Description

INFOID:000000008047665

#### FUNCTION

##### FUNCTION WHILE MOVING IN REVERSE

With power and ground supplied, transmission gear selector lever in R position, and the sonar system OFF switch ON, the sonar system will detect obstacles within 1.8 m (5.9 ft.) of the rear sonar sensors and within 0.5 m (1.64 ft.) of the two outer front sonar sensors (if equipped). The vehicle operator is notified of obstacles by varied rate of tone from the sonar buzzers depending on location and distance of obstacle being sensed. In Tow Mode, the rear center sonar sensors do not detect objects in the range of 40 cm (15.75 in.) or less to prevent detection of the trailer hitch.

##### FUNCTION WHILE MOVING FORWARD (WITH FRONT AND REAR SONAR SYSTEM)

With power and ground supplied, transmission gear selector lever in a forward drive gear, and the sonar system OFF switch ON, the front sonar system will detect obstacles within 1.0 m (3 ft.) of the front sonar sensors. The vehicle operator is notified of obstacles by varied rate of tone from the sonar buzzer depending on distance of obstacle being sensed. When the vehicle accelerates to 14.8 km/h (9.2 MPH) the sonar system will shut down. When the vehicle decelerates to 9.9 km/h (6.2 MPH) the sonar system will turn back on.

##### SONAR SYSTEM OFF SWITCH

With power and ground supplied to the sonar control unit, transmission gear selector lever in a position other than P, the sonar system can be disabled and the sonar buzzers silenced by momentarily pressing the sonar system OFF switch. The sonar system OFF indicator lamp will be illuminated in the sonar system OFF switch. The sonar system and buzzers will be disabled and the sonar system OFF indicator will be illuminated until the ignition switch is turned OFF. When the ignition switch is turned ON, the sonar system will be enabled. Depressing the sonar system OFF switch again will enable the sonar system also. Enabling the sonar system will cause the sonar system OFF indicator to go out. If the sonar control unit detects a malfunction in the front system, the front system will be disabled. If the sonar control unit detects a malfunction in the rear system, the rear system will be disabled. The indicator will flash when a malfunction exists in either system.

##### SONAR BUZZER (INTEGRAL WITH SONAR CONTROL UNIT)

##### FUNCTION WHILE MOVING IN REVERSE

With power and ground supplied to the sonar control unit and the A/T selector lever in R position, a stationary object that is at least 7.0 cm (2.8 in.) wide and 1.0 m (39.0 in. tall) and closer than 1.8 m (5.9 ft.) will be detected by the rear sonar sensors, causing the sonar buzzer to sound a tone. As the vehicle moves closer to the object, the rate of the tone will increase. When the object is less than 25.0 cm (10 in.) from the rear bumper, the tone will sound continuously.

# SYSTEM

## < SYSTEM DESCRIPTION >

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### FUNCTION WHILE MOVING FORWARD

With power and ground supplied to the sonar control unit and the A/T selector lever in a forward drive gear, a stationary object that is at least 9.0 cm (3.5 in.) wide and that is closer than 1.0 m (3 ft.) will be detected by the front sonar sensors, causing the sonar buzzer to sound a tone. As the vehicle moves closer to the object, the rate of the tone will increase. When the object is less than 30 cm (11.8 in.) from the front bumper, the tone will sound continuously.

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### REAR SONAR SENSORS

With power and ground supplied to the rear sonar sensors, the sonar sensors transmit an ultrasonic signal. This signal is reflected back to the sensor by objects large enough and close enough to be detected. The rear sonar sensors send information to the sonar control unit that represents the time from the transmitted signal to the time the signal is reflected back.

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### FRONT SONAR SENSORS

With power and ground supplied to the front sonar sensors, the sonar sensors transmit an ultrasonic signal. This signal is reflected back to the sensor by objects large enough and close enough to be detected. The front sonar sensors send information to the sonar control unit that represents the time from the transmitted signal to the time the signal is reflected back.

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### BACK-UP LAMP RELAY

The back-up lamp relay provides a reverse signal to the sonar control unit.

### COMBINATION METER

The combination meter provides the vehicle speed signal to the sonar control unit.

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# DIAGNOSIS SYSTEM (SONAR CONTROL UNIT)

< SYSTEM DESCRIPTION >

## DIAGNOSIS SYSTEM (SONAR CONTROL UNIT)

### CONSULT Function

INFOID:000000007071062

#### APPLICATION ITEM

CONSULT can display each diagnostic item using the diagnostic test modes shown following.

Diagnosis mode	Description
ECU Identification	Displays sonar control unit part number.
Self Diagnostic Results	Displays sonar control unit self-diagnosis results.
Data Monitor	Displays sonar control unit input/output data in real time.
Active Test	Sonar control unit can provide a drive signal to components to check their operation.
Work Support	Sonar control unit can change system settings based on driver requirements.

#### SELF DIAGNOSTIC PROCEDURE

##### NOTE:

Always perform Preliminary Check before running Self-Diagnostic Procedure. Refer to [SN-27, "Preliminary Check"](#).

CONSULT can be used to read and clear DTCs. Refer to [GI-47, "Description"](#).

#### ECU IDENTIFICATION

CONSULT displays the part number of the sonar control unit.

#### SELF DIAGNOSTIC RESULTS

Refer to [SN-13, "DTC Index"](#).

#### DATA MONITOR

Monitor Item	Display	Description
FRONT BUZZER	On	Front sonar buzzer ON.
	Off	Front sonar buzzer OFF.
REAR BUZZER	On	Rear sonar buzzer ON.
	Off	Rear sonar buzzer OFF.
P RANGE	On	Shift selector is in PARK.
	Off	Shift selector is not in PARK.
REVERSE RANGE	On	Shift selector is in Reverse.
	Off	Shift selector is not in Reverse.
CANCEL SW	On	Sonar system OFF switch pressed.
	Off	Sonar system OFF switch released.
CANCEL SW IND	On	Sonar system OFF switch indicator lamp is ON.
	Off	Sonar system OFF switch indicator lamp is OFF.
VHCL SPE COND	On	Sonar control unit vehicle speed condition meets specifications for sonar system operation.
	Off	Sonar control unit vehicle speed condition does not meet specifications for sonar system operation (vehicle speed to high).



# DIAGNOSIS SYSTEM (SONAR CONTROL UNIT)

## < SYSTEM DESCRIPTION >

Monitor Item	Display	Description
CR SEN [FL] CR SEN [FR] CR SEN [RL] CR SEN [RR]	ERROR	ERROR is displayed under the following conditions: <ul style="list-style-type: none"> <li>• sensor is malfunctioning.</li> <li>• sensor is disconnected.</li> <li>• sensor circuit is open.</li> </ul>
	LV.0	When a sensor is not detecting an object
	LV.1	The distance between the corner sensor and an obstacle is 100 cm (36 in.) or more and less than 180 cm (70.92 in.).
	LV.2	The distance between the corner sensor and an obstacle is 70 cm (27.6 in.) or more and less than 100 cm (36 in.).
	LV.3	The distance between the corner sensor and an obstacle is 50 cm (19.6 in.) or more and less than 70 cm (27.6 in.).
	LV.4	The distance between corner sensor and an obstacle less than 50 cm (19.6 in.).
CTR SEN [RL] CTR SEN [RR] CTR SEN [FL] CTR SEN [FR]	ERROR	ERROR is displayed under the following conditions: <ul style="list-style-type: none"> <li>• sensor is malfunctioning.</li> <li>• sensor is disconnected.</li> <li>• sensor circuit is open.</li> </ul>
	LV.0	When a sensor is not detecting an object
	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.).

## ACTIVE TEST

Active test item	Operation	Function
BUZZER	STOP	Sonar control unit turns OFF the buzzer.
	REAR ON	Sonar control unit turns ON the rear sonar buzzer.
	FRONT ON	Sonar control unit turns ON the front sonar buzzer.
CANCEL SW IND	ON	Sonar control unit turns the sonar system OFF switch indicator ON.
	OFF	Sonar control unit turns the sonar system OFF switch indicator OFF.
SONAR SENSOR	RR	Sonar control unit turns the rear sonar sensor RH inner ON.
	RL	Sonar control unit turns the rear sonar sensor LH inner ON.
	CRR	Sonar control unit turns the rear sonar sensor RH outer ON.
	CRL	Sonar control unit turns the rear sonar sensor LH outer ON.
	FR	Sonar control unit turns the front sonar sensor RH inner ON.
	FL	Sonar control unit turns the front sonar sensor LH inner ON.
	CFR	Sonar control unit turns the front sonar sensor RH outer ON.
	CFL	Sonar control unit turns the front sonar sensor LH outer ON.
OFF	Sonar control unit turns all sonar sensors OFF.	

## WORK SUPPORT

Work support item	Function
VOLUME SETTING	Sonar buzzer volume can be adjusted.
TRAILER HITCH MODE	Detection range of the rear center sonar sensors is adjustable to compensate for towing applications.

## TRAILER HITCH MODE

## DIAGNOSIS SYSTEM (SONAR CONTROL UNIT)

### < SYSTEM DESCRIPTION >

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Rear center sonar sensors are adjustable to ignore objects less than 40 cm (15.7 in) away.

**Trailer hitch installed (no audio buzzer) : ON**

**Trailer hitch not installed (audio buzzer) : OFF**

# SONAR CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

## ECU DIAGNOSIS INFORMATION

### SONAR CONTROL UNIT

Reference Value

INFOID:000000007071063

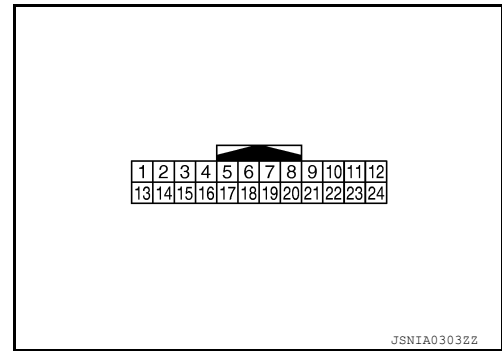
VALUES ON THE DIAGNOSIS TOOL

Monitor Item	Display	Description
FRONT BUZZER	On	Front sonar buzzer ON.
	Off	Front sonar buzzer OFF.
REAR BUZZER	On	Rear sonar buzzer ON.
	Off	Rear sonar buzzer OFF.
P RANGE	On	Shift selector is in PARK.
	Off	Shift selector is not in PARK.
REVERSE RANGE	On	Shift selector is in Reverse.
	Off	Shift selector is not in Reverse.
CANCEL SW	On	Sonar system OFF switch pressed.
	Off	Sonar system OFF switch released.
CANCEL SW IND	On	Sonar system OFF switch indicator lamp is ON.
	Off	Sonar system OFF switch indicator lamp is OFF.
VHCL SPE COND	On	Sonar control unit vehicle speed condition meets specification for sonar system operation.
	Off	Sonar control unit vehicle speed condition does not meet specification for sonar system operation (vehicle speed to high).
CR SEN [RL] CR SEN [FR] CR SEN [RL] CR SEN [RR]	ERROR	ERROR is displayed under the following conditions: <ul style="list-style-type: none"> <li>• sensor is malfunctioning.</li> <li>• sensor is disconnected.</li> <li>• sensor circuit is open.</li> </ul>
	LV.0	When a sensor is not detecting an object
	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 corner 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 corner sensor and an obstacle is 30 cm (11.8 in) or more and less than 50 cm (19.6 in).
CTR SEN [RL] CTR SEN [RR] CTR SEN [FL] CTR SEN [FR]	ERROR	ERROR is displayed under the following conditions: <ul style="list-style-type: none"> <li>• sensor is malfunctioning.</li> <li>• sensor is disconnected.</li> <li>• sensor circuit is open.</li> </ul>
	LV.0	When a sensor is not detecting an object
	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).	

# SONAR CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

## TERMINAL LAYOUT



## PHYSICAL VALUES

Terminal (wire color)	Item	Condition		Reference value (V) (Approx.)	
		Ignition switch	Operation		
2 (O)	Sonar system OFF switch signal	ON	Sonar system OFF switch	Pressed	0
				Released	Battery voltage
3 (W)	Front sonar sensor signal - LH outer	ON	<ul style="list-style-type: none"> <li>• Sonar system OFF switch ON</li> <li>• Transmission gear selector lever in D position</li> <li>• No obstacles</li> </ul>	Battery voltage	
4 (G)	Front sonar sensor signal - RH outer	ON	<ul style="list-style-type: none"> <li>• Sonar system OFF switch ON</li> <li>• Transmission gear selector lever in D position</li> <li>• No obstacles</li> </ul>	Battery voltage	
5 (W)	Rear sonar sensor signal - LH outer	ON	<ul style="list-style-type: none"> <li>• Sonar system OFF switch ON</li> <li>• Transmission gear selector lever in R position</li> <li>• No obstacles</li> </ul>	Battery voltage	
6 (G)	Rear sonar sensor signal - RH outer	ON	<ul style="list-style-type: none"> <li>• Sonar system OFF switch ON</li> <li>• Transmission gear selector lever in R position</li> <li>• No obstacles</li> </ul>	Battery voltage	
7 (L)	Rear sonar sensor signal - LH inner	ON	<ul style="list-style-type: none"> <li>• Sonar system OFF switch ON</li> <li>• Transmission gear selector lever in R position</li> <li>• Distance obstacles</li> </ul>	Battery voltage	
8 (BR)	Rear sonar sensor signal - RH inner	ON	<ul style="list-style-type: none"> <li>• Sonar system OFF switch ON</li> <li>• Transmission gear selector lever in R position</li> <li>• Distance obstacles</li> </ul>	Battery voltage	
9 (B)	Front sonar sensor signal - LH inner	ON	<ul style="list-style-type: none"> <li>• Sonar system OFF switch ON</li> <li>• Transmission gear selector lever in D position</li> <li>• No obstacles</li> </ul>	Battery voltage	
10 (R)	Front sonar sensor signal - RH inner	ON	<ul style="list-style-type: none"> <li>• Sonar system OFF switch ON</li> <li>• Transmission gear selector lever in D position</li> <li>• No obstacles</li> </ul>	Battery voltage	
11 (GR)	Sonar system OFF indicator output	ON	Sonar system OFF switch	ON	0
				OFF	Battery voltage

# SONAR CONTROL UNIT

## < ECU DIAGNOSIS INFORMATION >

Terminal (wire color)	Item	Condition		Reference value (V) (Approx.)	
		Ignition switch	Operation		
12 (Y)	Sonar sensor ground	ON	—	0	
13 (R)	Sonar control unit power	ON	—	Battery voltage	
15 (P)	Vehicle speed signal (8-pulse)	ON	Speedometer operated [When vehicle speed is approx. 40 km/h (25 MPH)]	<p><b>NOTE:</b> Maximum voltage may be 12V due to specifications (connected units).</p> <p style="text-align: right; font-size: small;">PK1C0643E</p>	
16 (W)	Park signal	ON	Transmission gear selector lever	P position	Battery voltage
				Not P position	0
17 (O)	Reverse signal	ON	Transmission gear selector lever	R position	Battery voltage
				Not R position	0
18 (O)	K-line	—	—	—	
24 (B)	Sonar control unit ground	—	—	0	

### Fail-Safe

INFOID:000000007071064

The buzzer function is deactivated and the sonar system OFF switch indicator blinks when a sonar system malfunction is detected.

### DTC Index

INFOID:000000008047675

DTC	Malfunction	Service Procedure
B2700	Front sonar sensor LH outer	Replace sonar sensor. Refer to <a href="#">SN-35, "FRONT SENSOR : Removal and Installation"</a> .
B2701	Front sonar sensor LH outer harness	<ol style="list-style-type: none"> <li>1. Check harness for open or short. Refer to <a href="#">SN-29, "Diagnosis Procedure"</a>.</li> <li>2. Replace sonar sensor. Refer to <a href="#">SN-35, "FRONT SENSOR : Removal and Installation"</a>.</li> </ol>
B2702	Front sonar sensor RH outer	Replace sonar sensor. Refer to <a href="#">SN-35, "FRONT SENSOR : Removal and Installation"</a> .
B2703	Front sonar sensor RH outer harness	<ol style="list-style-type: none"> <li>1. Check harness for open or short. Refer to <a href="#">SN-29, "Diagnosis Procedure"</a>.</li> <li>2. Replace sonar sensor. Refer to <a href="#">SN-35, "FRONT SENSOR : Removal and Installation"</a>.</li> </ol>
B2704	Rear sonar sensor LH outer	Replace sonar sensor. Refer to <a href="#">SN-37, "REAR SENSOR : Removal and Installation"</a> .
B2705	Rear sonar sensor LH outer harness	<ol style="list-style-type: none"> <li>1. Check harness for open or short. Refer to <a href="#">SN-29, "Diagnosis Procedure"</a>.</li> <li>2. Replace sonar sensor. Refer to <a href="#">SN-37, "REAR SENSOR : Removal and Installation"</a>.</li> </ol>
B2706	Rear sonar sensor RH outer	Replace sonar sensor. Refer to <a href="#">SN-37, "REAR SENSOR : Removal and Installation"</a> .

# SONAR CONTROL UNIT

## < ECU DIAGNOSIS INFORMATION >

DTC	Malfunction	Service Procedure
B2707	Rear sonar sensor RH outer harness	<ol style="list-style-type: none"> <li>1. Check harness for open or short. Refer to <a href="#">SN-29, "Diagnosis Procedure"</a>.</li> <li>2. Replace sonar sensor. Refer to <a href="#">SN-37, "REAR SENSOR : Removal and Installation"</a>.</li> </ol>
B2708	Rear sonar sensor LH inner	Replace sonar sensor. Refer to <a href="#">SN-37, "REAR SENSOR : Removal and Installation"</a> .
B2709	Rear sonar sensor LH inner harness	<ol style="list-style-type: none"> <li>1. Check harness for open or short. Refer to <a href="#">SN-29, "Diagnosis Procedure"</a>.</li> <li>2. Replace sonar sensor. Refer to <a href="#">SN-37, "REAR SENSOR : Removal and Installation"</a>.</li> </ol>
B270A	Rear sonar sensor RH inner	Replace sonar sensor. Refer to <a href="#">SN-37, "REAR SENSOR : Removal and Installation"</a> .
B270B	Rear sonar sensor RH inner harness	<ol style="list-style-type: none"> <li>1. Check harness for open or short. Refer to <a href="#">SN-29, "Diagnosis Procedure"</a>.</li> <li>2. Replace sonar sensor. Refer to <a href="#">SN-37, "REAR SENSOR : Removal and Installation"</a>.</li> </ol>
B270C	Front sonar sensor LH inner	Replace sonar sensor. Refer to <a href="#">SN-35, "FRONT SENSOR : Removal and Installation"</a> .
B270D	Front sonar sensor LH inner harness	<ol style="list-style-type: none"> <li>1. Check harness for open or short. Refer to <a href="#">SN-29, "Diagnosis Procedure"</a>.</li> <li>2. Replace sonar sensor. Refer to <a href="#">SN-35, "FRONT SENSOR : Removal and Installation"</a>.</li> </ol>
B270E	Front sonar sensor RH inner	Replace sonar sensor. Refer to <a href="#">SN-35, "FRONT SENSOR : Removal and Installation"</a> .
B270F	Front sonar sensor RH inner harness	<ol style="list-style-type: none"> <li>1. Check harness for open or short. Refer to <a href="#">SN-29, "Diagnosis Procedure"</a>.</li> <li>2. Replace sonar sensor. Refer to <a href="#">SN-35, "FRONT SENSOR : Removal and Installation"</a>.</li> </ol>

# SONAR SYSTEM

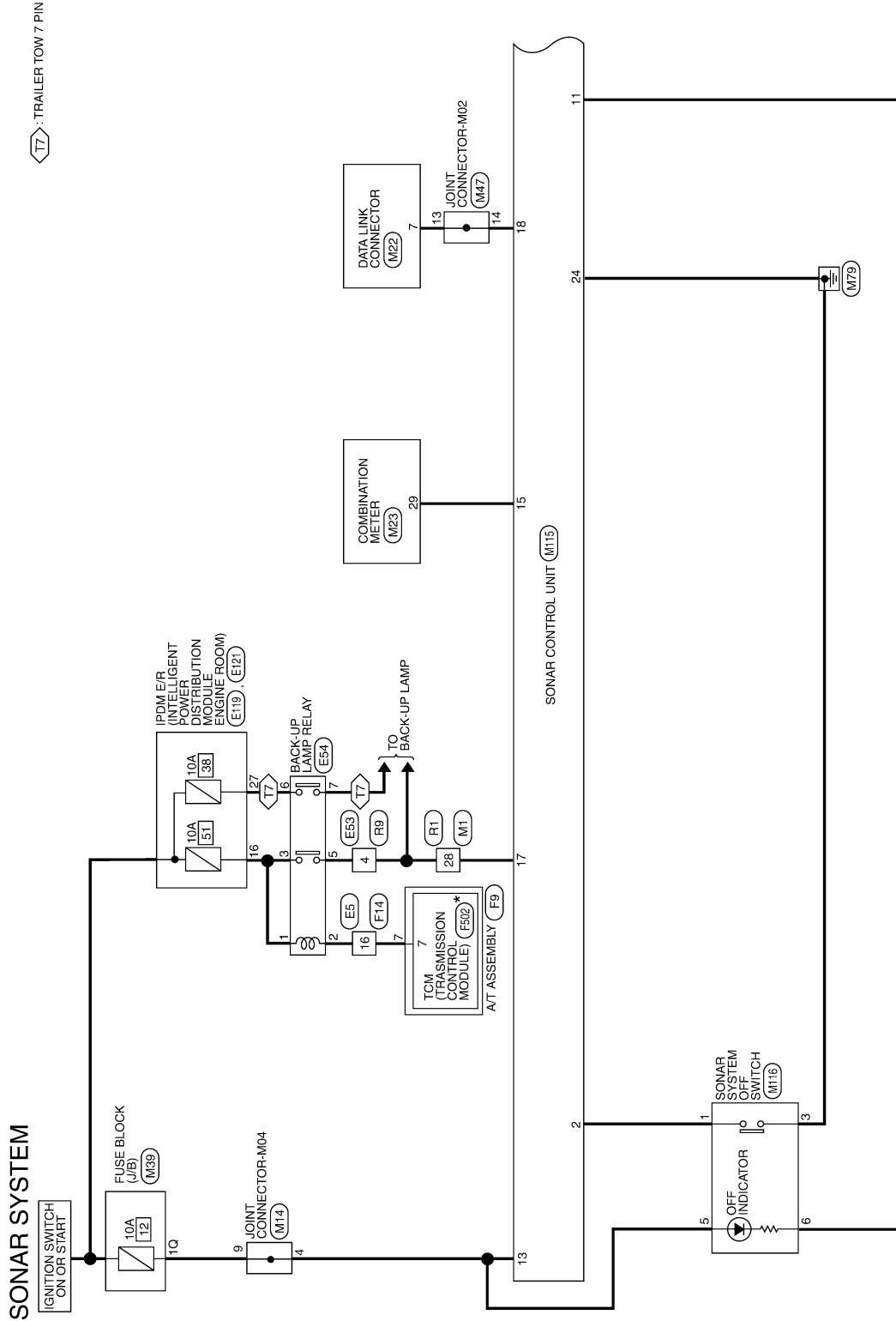
< WIRING DIAGRAM >

## WIRING DIAGRAM

### SONAR SYSTEM

#### Wiring Diagram

INFOID:000000008050303



\* : THIS CONNECTOR IS NOT SHOWN IN "HARNES LAYOUT" OF PG SECTION.

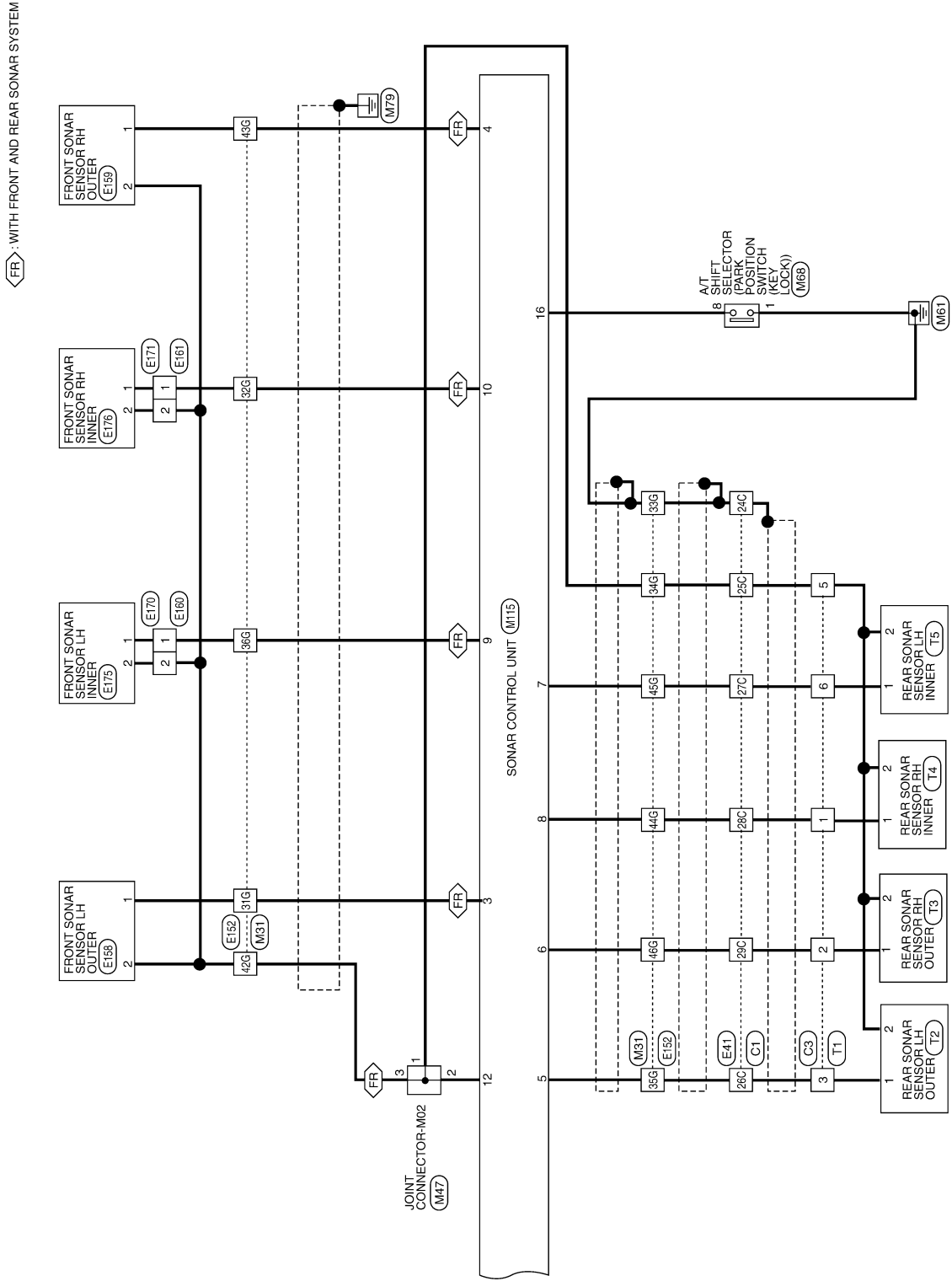
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# SONAR SYSTEM

< WIRING DIAGRAM >



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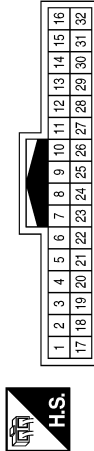


# SONAR SYSTEM

< WIRING DIAGRAM >

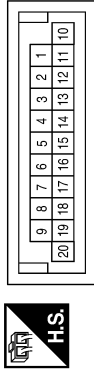
## SONAR SYSTEM CONNECTORS

Connector No.	M1
Connector Name	WIRE TO WIRE
Connector Color	WHITE



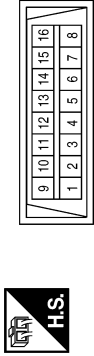
Terminal No.	Color of Wire	Signal Name
28	O	-

Connector No.	M14
Connector Name	JOINT CONNECTOR-M04
Connector Color	BLUE



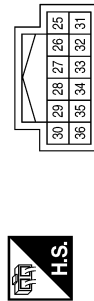
Terminal No.	Color of Wire	Signal Name
4	R	-
9	R	-

Connector No.	M22
Connector Name	DATA LINK CONNECTOR
Connector Color	WHITE



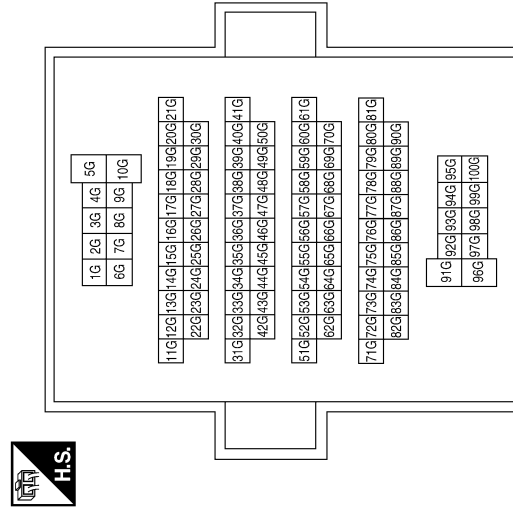
Terminal No.	Color of Wire	Signal Name
7	O	-

Connector No.	M23
Connector Name	COMBINATION METER
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
29	P	SPEED OUT 8

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
31G	W	-
32G	R	-
33G	SHIELD	-
34G	Y	-
35G	W	-
36G	B	-
42G	GR	-
43G	G	-
44G	BR	-
45G	L	-
46G	G	-

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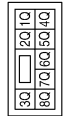
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# SONAR SYSTEM

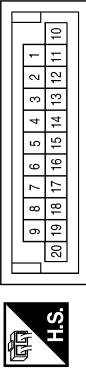
< WIRING DIAGRAM >

Connector No.	M39
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
10Q	R	-

Connector No.	M47
Connector Name	JOINT CONNECTOR-M02
Connector Color	GREEN



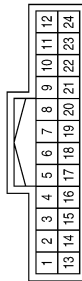
Terminal No.	Color of Wire	Signal Name
1	Y	-
2	Y	-
3	GR	-
13	O	-
14	O	-

Connector No.	M68
Connector Name	A/T SHIFT CONNECTOR
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	B	-
8	W	-

Connector No.	M115
Connector Name	SONAR CONTROL UNIT
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	-	-
2	O	SYSTEM CANCEL SWITCH
3	W	CORNER SONAR FRONT LEFT
4	G	CORNER SONAR FRONT RIGHT
5	W	CORNER SONAR REAR LEFT
6	G	CORNER SONAR REAR RIGHT
7	L	BACK SONAR LEFT
8	BR	BACK SONAR RIGHT
9	B	FRONT SONAR LEFT

Terminal No.	Color of Wire	Signal Name
10	R	FRONT SONAR RIGHT
11	GR	SYSTEM STATUS INDICATOR
12	Y	SENSOR GND
13	R	POWER SUPPLY IGN
14	-	-
15	P	VEHICLE SPEED INPUT
16	W	PARKING POSITION INPUT
17	O	REVERSE POSITION INPUT
18	O	K-LINE
19	-	-
20	-	-
21	-	-
22	-	-
23	-	-
24	B	SYSTEM GND

Connector No.	M116
Connector Name	SONAR SYSTEM OFF SWITCH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	O	-
3	B	-
5	R	-
6	GR	-

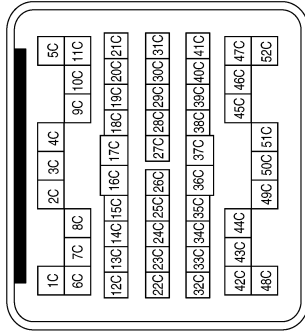
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# SONAR SYSTEM

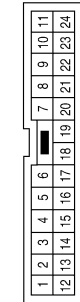
## < WIRING DIAGRAM >

Terminal No.	Color of Wire	Signal Name
24C	GR	-
25C	Y	-
26C	W	-
27C	R	-
28C	G	-
29C	R	-

Connector No.	E41
Connector Name	WIRE TO WIRE
Connector Color	GRAY

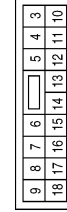


Connector No.	E5
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
16	R	-

Connector No.	E119
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



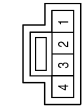
Terminal No.	Color of Wire	Signal Name
16	G	REVERSE LAMP

Connector No.	E54
Connector Name	BACK-UP LAMP RELAY
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1	G	-
2	R	-
3	G	-
5	O	-
6	SB	-
7	Y	-

Connector No.	E53
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
4	O	-

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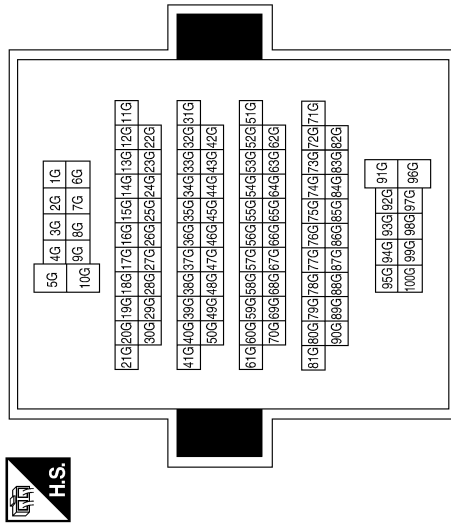
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# SONAR SYSTEM

< WIRING DIAGRAM >

Terminal No.	Color of Wire	Signal Name
31G	W	-
32G	R	-
33G	GR	-
34G	Y	-
35G	W	-
36G	R	-
42G	B	-
43G	G	-
44G	B	-
45G	R	-
46G	G	-

Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Connector No.	E121
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
27	SB	TTOW REV LAMP

Connector No.	E160
Connector Name	WIRE TO WIRE
Connector Color	BLACK



Connector No.	E159
Connector Name	FRONT SONAR SENSOR RH OUTER
Connector Color	BLACK



Connector No.	E158
Connector Name	FRONT SONAR SENSOR LH OUTER
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	B	-
4	R	-

Terminal No.	Color of Wire	Signal Name
1	G	-
2	B	-

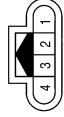
Terminal No.	Color of Wire	Signal Name
1	W	-
2	B	-

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# SONAR SYSTEM

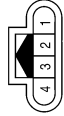
< WIRING DIAGRAM >

Connector No.	E171
Connector Name	WIRE TO WIRE
Connector Color	BLACK



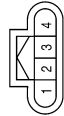
Terminal No.	Color of Wire	Signal Name
1	B	-
4	R	-

Connector No.	E170
Connector Name	WIRE TO WIRE
Connector Color	BLACK



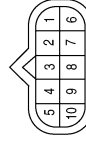
Terminal No.	Color of Wire	Signal Name
1	B	-
4	R	-

Connector No.	E161
Connector Name	WIRE TO WIRE
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	B	-
4	R	-

Connector No.	F9
Connector Name	A/T ASSEMBLY
Connector Color	GREEN



Terminal No.	Color of Wire	Signal Name
7	R	-

Connector No.	E176
Connector Name	FRONT SONAR SENSOR RH INNER
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	R	-
2	B	-

Connector No.	E175
Connector Name	FRONT SONAR SENSOR LH INNER
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	R	-
2	B	-

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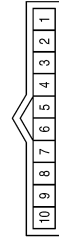
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# SONAR SYSTEM

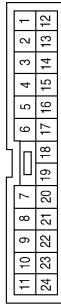
< WIRING DIAGRAM >

Connector No.	F502
Connector Name	TCM (TRANSMISSION CONTROL MODULE)
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
7	O	REV LAMP RLY

Connector No.	F14
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
16	R	-

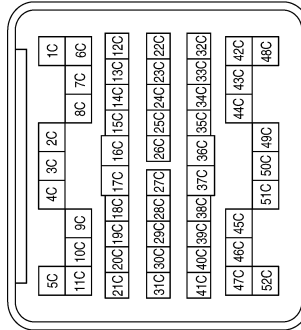
Connector No.	C3
Connector Name	WIRE TO WIRE
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	B	-
2	G	-
3	W	-
5	Y	-
6	R	-

Terminal No.	Color of Wire	Signal Name
24C	GR	-
25C	Y	-
26C	W	-
27C	R	-
28C	B	-
29C	G	-

Connector No.	C1
Connector Name	WIRE TO WIRE
Connector Color	GRAY



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# SONAR SYSTEM

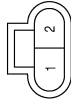
## < WIRING DIAGRAM >

Connector No.	T1
Connector Name	WIRE TO WIRE
Connector Color	GRAY



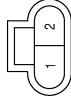
Terminal No.	Color of Wire	Signal Name
1	B	-
2	G	-
3	W	-
5	BR	-
6	R	-

Connector No.	T2
Connector Name	REAR SONAR SENSOR LH OUTER
Connector Color	BLACK



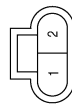
Terminal No.	Color of Wire	Signal Name
1	W	-
2	BR	-

Connector No.	T3
Connector Name	REAR SONAR SENSOR RH OUTER
Connector Color	BLACK



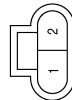
Terminal No.	Color of Wire	Signal Name
1	G	-
2	BR	-

Connector No.	T4
Connector Name	REAR SONAR SENSOR RH INNER
Connector Color	BLACK



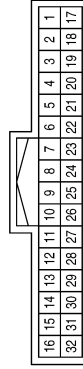
Terminal No.	Color of Wire	Signal Name
1	B	-
2	BR	-

Connector No.	T5
Connector Name	REAR SONAR SENSOR LH INNER
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	R	-
2	BR	-

Connector No.	R1
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
28	O	-

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# SONAR SYSTEM

## < WIRING DIAGRAM >

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Connector No.	R9
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
4	O	-

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# DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

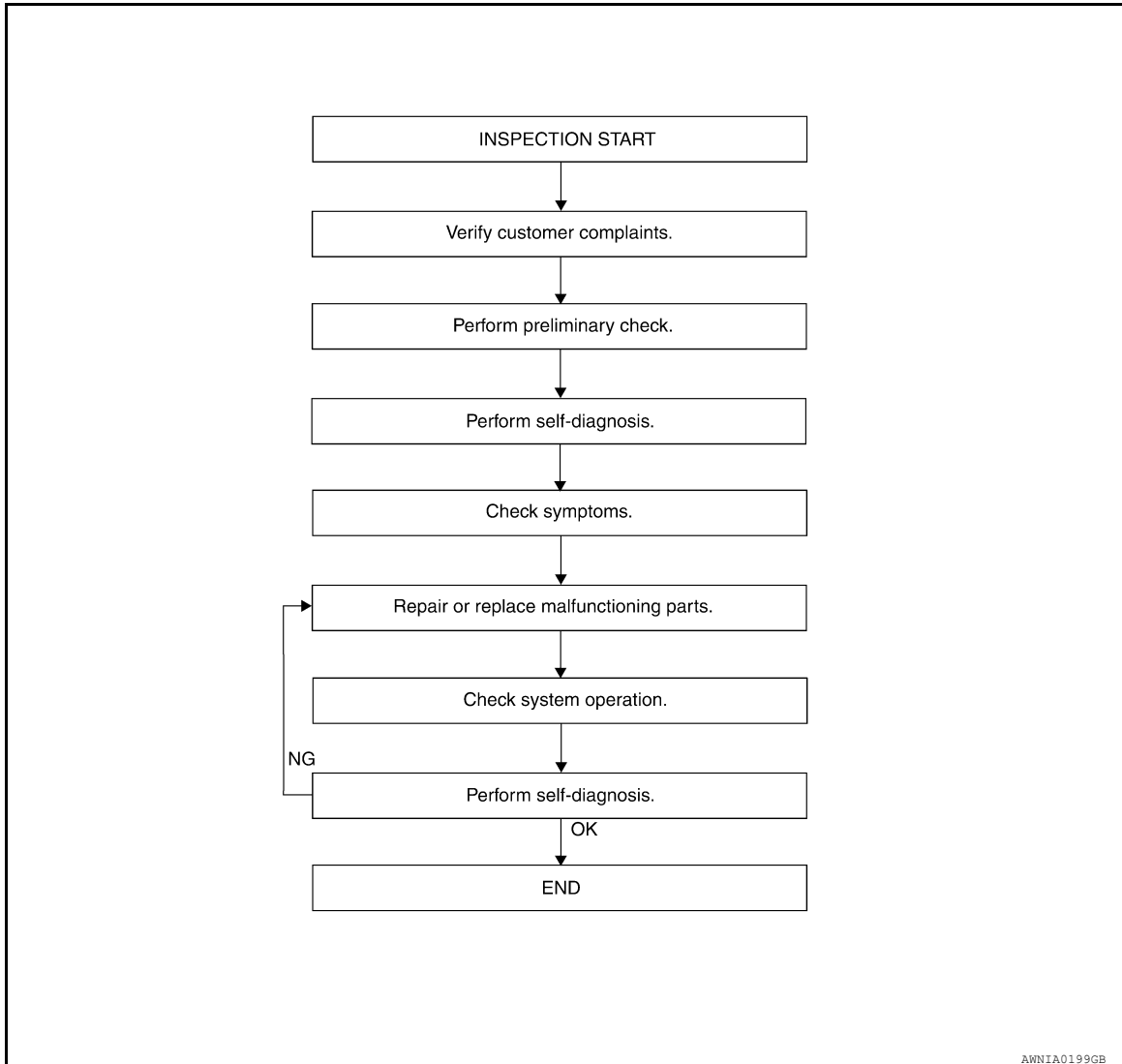
## BASIC INSPECTION

### DIAGNOSIS AND REPAIR WORKFLOW

#### WORK FLOW

INFOID:000000006736496

#### WORK FLOW



#### DETAILED FLOW

### 1. CUSTOMER INFORMATION

Interview the customer to obtain detailed information about the symptom.

>> GO TO 2.

### 2. PRELIMINARY CHECK

Perform preliminary check. Refer to [SN-27, "Preliminary Check"](#).

>> GO TO 3.

### 3. SELF-DIAGNOSIS

Perform self-diagnosis. Refer to [SN-8, "CONSULT Function"](#).

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# DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

---

>> GO TO 4.

## 4.SYMPTOM

---

Check for symptoms. Refer to [SN-34. "Symptom Table"](#).

>> GO TO 5.

## 5.MALFUNCTIONING PARTS

---

Repair or replace the applicable parts.

>> GO TO 6.

## 6.SYSTEM OPERATION

---

Check system operation. Refer to [SN-27. "Preliminary Check"](#).

>> GO TO 7.

## 7.SELF-DIAGNOSIS

---

Perform self-diagnosis. Refer to [SN-8. "CONSULT Function"](#).

Are any DTCs displayed?

YES >> GO TO 5

NO >> Inspection End.

# INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

## INSPECTION AND ADJUSTMENT

### Preliminary Check

INFOID:000000006736497

#### DESCRIPTION

The purpose of the sonar sensor preliminary check is to confirm that there are no outside factors affecting the sonar system.

#### CONDITIONS

- Ignition switch ON
- No obstructions within 3.0 m (10 ft.) of sonar sensors

#### SONAR SENSOR STATUS CHECK

- Check that the sonar sensors are properly aligned (no deformation in sensor mounting areas).
- Check that snow, mud or other foreign objects are not adhering to the sonar sensors.
- Check that there is no deformation, scratches or other damage to the sonar sensors.
- Check that water has not accumulated in the sonar sensors.

#### **CAUTION:**

**Use water, cotton swab, or other soft material for cleaning the sensors.**

1. Inspect for the following:
  - Physical damage to wiring
  - Physical damage to harness connectors
  - Loose or disconnected harness connectors
  - Physical damage to system components
2. Check that there are no obstacles within each sonar sensor's detection range.

Sonar sensors	Detection range
Front	Approx. 1.0 m (3 ft.) maximum
Rear	Approx. 1.8 m (5.9 ft.) maximum

3. Check that there are no nearby ultrasound sources such as the sounds of vehicle horns, motorcycle engines or truck air brakes.
4. Check that the vehicle is on a level surface.

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# POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

## DTC/CIRCUIT DIAGNOSIS

### POWER SUPPLY AND GROUND CIRCUIT

#### Diagnosis Procedure

INFOID:000000007107217

Regarding Wiring Diagram information, refer to [SN-15, "Wiring Diagram"](#).

#### INSPECTION FOR POWER SUPPLY AND GROUND CIRCUIT

##### 1. CHECK FUSES

Check for blown sonar system fuse.

Unit	Power Source	Fuse	Location
Sonar control unit	ON or START	12	Fuse block (J/B)

##### Is the fuse blown?

YES >> Replace the fuse after repairing the affected circuit.

NO >> GO TO 2.

##### 2. CHECK POWER SUPPLY CIRCUIT

1. Disconnect sonar control unit connector M115.
2. Turn ignition switch ON.
3. Check voltage between sonar control unit connector M115 terminal 13 and ground.

Terminals			Voltage (approx.)
(+)		(-)	
Connector	Terminal		
M115	13	Ground	Battery voltage

##### Is the inspection result normal?

YES >> GO TO 3.

NO >> Check harness for open between sonar control unit and fuse.

##### 3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between sonar control unit M115 terminal 24 and ground.

Terminals			Continuity
(+)		(-)	
Connector	Terminal		
M115	24	Ground	Yes

##### Is the inspection result normal?

YES >> Inspection End.

NO >> Check harness ground circuit, repair if needed.

# SONAR SENSOR CIRCUIT INSPECTION

< DTC/CIRCUIT DIAGNOSIS >

## SONAR SENSOR CIRCUIT INSPECTION

### Description

INFOID:000000007071215

With power and ground supplied to the sonar sensors, the sonar sensors transmit an ultrasonic signal. This signal is reflected back to the sensor by objects large enough and close enough to be detected. The sonar sensors measure the time from the transmitted signal to the time the signal is reflected back and send this information to the sonar control unit.

### Component Function Check

INFOID:000000007071216

#### 1. CHECK FUNCTION

1. Select SONAR SENSOR in Active test mode with CONSULT.
2. Check sonar sensor operation.

Test Item	CONSULT	Description
SONAR SENSOR	RR	Sonar control unit turns the rear sonar sensor RH inner ON.
	RL	Sonar control unit turns the rear sonar sensor LH inner ON.
	CRR	Sonar control unit turns the rear sonar sensor RH outer ON.
	CRL	Sonar control unit turns the rear sonar sensor LH outer ON.
	FR	Sonar control unit turns the front sonar sensor RH inner ON.
	FL	Sonar control unit turns the front sonar sensor LH inner ON.
	CFL	Sonar control unit turns the front sonar sensor RH outer ON.
	CFR	Sonar control unit turns the front sonar sensor LH outer ON.
	OFF	Sonar control unit turns all sonar sensors OFF.

#### Is the inspection result normal?

- YES >> Inspection End.  
 NO >> Perform diagnosis procedure. Refer to [SN-29, "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:000000008050305

Regarding Wiring Diagram information, refer to [SN-15, "Wiring Diagram"](#)

#### 1. CHECK SONAR SENSOR CIRCUITS

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connectors and sonar sensor connectors.
3. Check continuity between sonar control unit harness connectors and the front sonar sensor harness connectors.

Connector	Terminal	Connector	Terminal	Continuity
M115	3	E158	1	Yes
	4	E159		
	9	E175		
	10	E176		
	12	E158, E159, E175, E176	2	

4. Check continuity between sonar control unit harness connectors and the rear sonar sensor harness connectors.

# SONAR SENSOR CIRCUIT INSPECTION

## < DTC/CIRCUIT DIAGNOSIS >

Connector	Terminal	Connector	Terminal	Continuity
M115	5	T2	1	Yes
	6	T3		
	7	T5		
	8	T4		
	12	T2, T3, T4, T5	2	

5. Check continuity between the front sonar control unit harness connectors and ground.

Connector	Terminal	Continuity
M115	3, 4, 9, 10, 12	No

6. Check continuity between the rear sonar control unit harness connectors and ground.

Connector	Terminal	Continuity
M115	5, 6, 7, 8, 12	No

Is the inspection result normal?

- YES >> Inspection End.  
 NO >> Repair harness or connector.

## Component Inspection

INFOID:000000007071219

### 1. CHECK FUNCTION

- Select CR SEN[FL], CR SEN[FR], CTR SEN[FL], CTR SEN[FR], CR SEN[RL], CR SEN[RR], CTR SEN[RL], CTR SEN[RR] in Data monitor mode with CONSULT.
- Check sonar sensor signal under the following conditions.

Monitor Item	Display	Description
CR SEN [FL] CR SEN [FR] CR SEN [RL] CR SEN [RR]	ERROR	ERROR is displayed under the following conditions: <ul style="list-style-type: none"> <li>• sensor is malfunctioning.</li> <li>• sensor is disconnected.</li> <li>• sensor circuit is open.</li> </ul>
	LV.0	When a sensor is not detecting an object
	LV.1	The distance between the corner sensor and an obstacle is 100 cm (36 in.) or more and less than 180 cm (70.92 in.).
	LV.2	The distance between the corner sensor and an obstacle is 70 cm (27.6 in.) or more and less than 100 cm (36 in.).
	LV.3	The distance between the corner sensor and an obstacle is 50 cm ( 19.6 in.) or more and less than 70 cm (27.6 in.).
	LV.4	The distance between corner sensor and an obstacle less than 50 cm (19.6 in.).
CTR SEN [RL] CTR SEN [RR] CTR SEN [FL] CTR SEN [FR]	ERROR	ERROR is displayed under the following conditions: <ul style="list-style-type: none"> <li>• sensor is malfunctioning.</li> <li>• sensor is disconnected.</li> <li>• sensor circuit is open.</li> </ul>
	LV.0	When a sensor is not detecting an object
	LV.1	The distance between the center sensor and an obstacle is 60 cm (23.6in) or more and less than 100 cm (36 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).

Is the inspection result normal?

# SONAR SENSOR CIRCUIT INSPECTION

## < DTC/CIRCUIT DIAGNOSIS >

---

YES >> Inspection End.

NO >> Perform diagnosis procedure. Refer to [SN-29, "Diagnosis Procedure"](#).

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**SN**

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# SONAR SYSTEM OFF SWITCH CIRCUIT INSPECTION

< DTC/CIRCUIT DIAGNOSIS >

## SONAR SYSTEM OFF SWITCH CIRCUIT INSPECTION

### Description

INFOID:000000007071220

The sonar system can be disabled by momentarily pressing the sonar system OFF switch. The sonar system OFF indicator lamp will be illuminated when the sonar system is OFF. Enabling the sonar system will cause the sonar system OFF indicator to go out. The indicator will flash if a malfunction exists in the system.

### Component Function Check

INFOID:000000007071221

#### SONAR SYSTEM OFF SWITCH

##### 1. CHECK FUNCTION

1. Select CANCEL SW and CANCEL SW IND in Data Monitor mode with CONSULT.
2. Check sonar system off switch signal under the following conditions.

Monitor Item	Display	Description
CANCEL SW	On	Sonar system OFF switch pressed.
	Off	Sonar system OFF switch released.
CANCEL SW IND	On	Sonar system OFF switch indicator lamp is ON.
	Off	Sonar system OFF switch indicator lamp is OFF.

##### Is the inspection result normal?

- YES >> Inspection End.  
NO >> Perform diagnosis procedure. Refer to [SN-32, "Diagnosis Procedure"](#).

#### SONAR SYSTEM OFF SWITCH INDICATOR

##### 1. CHECK FUNCTION

1. Select CANCEL SW IND in Active test mode with CONSULT.
2. Check the sonar system off switch operation.

Active test item	Operation	Function
CANCEL SW IND	ON	Sonar control unit turns the sonar system OFF switch indicator ON.
	OFF	Sonar control unit turns the sonar system OFF switch indicator OFF.

##### Is the inspection result normal?

- YES >> Inspection End.  
NO >> Perform diagnosis procedure. Refer to [SN-32, "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:000000007071222

Regarding Wiring Diagram information, refer to [SN-15, "Wiring Diagram"](#).

##### 1. CHECK SONAR SYSTEM OFF SWITCH

Refer to [SN-33, "Component Inspection"](#).

##### Is the inspection result normal?

- YES >> GO TO 2.  
NO >> Replace sonar system OFF switch. Refer to [SN-39, "Removal and Installation"](#).

##### 2. CHECK SONAR SYSTEM OFF SWITCH CIRCUITS

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



# SONAR SYSTEM OFF SWITCH CIRCUIT INSPECTION

## < DTC/CIRCUIT DIAGNOSIS >

Connector	Terminal	Connector	Terminal	Continuity
M115	2	M116	1	Yes
	13		5	
	11		6	

4. Check continuity between sonar system OFF switch harness connector and ground.

Connector	Terminal	Continuity
M116	1, 5, 6	No
	3	Yes

Is the inspection result normal?

YES >> Inspection End.

NO >> Repair harness or connector.

## Component Inspection

INFOID:000000007071223

### SONAR SYSTEM OFF SWITCH

1. Disconnect the sonar system OFF switch connector.
2. Check continuity between the following switch terminals.

Sonar system OFF switch	Terminals	Continuity
Depressed	1 - 3	Yes
Released		No

### SONAR SYSTEM OFF INDICATOR

1. Disconnect the sonar system OFF switch connector.
2. Apply battery voltage to switch terminal 5.
3. Check the sonar system OFF indicator operation when switch terminal 6 is connected to battery ground.

	Terminals	Condition	Operation
Sonar system OFF switch	5	Battery voltage	Indicator ON
	6	Ground	

# SONAR SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

## SYMPTOM DIAGNOSIS

### SONAR SYSTEM SYMPTOMS

#### Symptom Table

INFOID:000000008047683

**NOTE:**

Always perform Preliminary Check and Self-Diagnosis Function before diagnosing vehicle by symptom. Refer to [SN-27, "Preliminary Check"](#) and [SN-8, "CONSULT Function"](#).

Symptom	Repair order
When the transmission gear selector lever is in the R position and the sonar system is ON, the rear sonar system does not operate.	<ol style="list-style-type: none"> <li>1. Check sonar control unit power and ground circuits. Refer to <a href="#">SN-15, "Wiring Diagram"</a>.</li> <li>2. Check transmission range switch. Refer to <a href="#">TM-86, "Diagnosis Procedure"</a>.</li> <li>3. Check back-up lamp relay.</li> <li>4. Check related harness and connections for back-up lamp relay.</li> <li>5. Check rear sonar sensors. Refer to <a href="#">SN-29, "Component Function Check"</a>.</li> <li>6. Replace sonar control unit. Refer to <a href="#">SN-38, "Removal and Installation"</a>.</li> </ol>
When the transmission gear selector lever is in a forward drive gear and the sonar system is ON, the front sonar system does not operate. (with front and rear sonar system)	<ol style="list-style-type: none"> <li>1. Check sonar control unit power and ground circuits. Refer to <a href="#">SN-28, "Diagnosis Procedure"</a>.</li> <li>2. Check the transmission range switch. Refer to <a href="#">TM-86, "Diagnosis Procedure"</a>.</li> <li>3. Check back-up lamp relay.</li> <li>4. Check A/T shift selector (park position switch) circuit.</li> <li>5. Check front sonar sensors. Refer to <a href="#">SN-29, "Component Function Check"</a>.</li> <li>6. Replace sonar control unit. Refer to <a href="#">SN-38, "Removal and Installation"</a>.</li> </ol>
Buzzer sounds although there are no obstacles within the detection range (false detection).	<ol style="list-style-type: none"> <li>1. Check all sonar sensors for misalignment or damage (including bumper and fascia). Refer to <a href="#">SN-35, "FRONT SENSOR: Removal and Installation"</a> or <a href="#">SN-37, "REAR SENSOR: Removal and Installation"</a>.</li> <li>2. Check all sonar sensors for dirt or ice buildup. Refer to <a href="#">SN-27, "Preliminary Check"</a>.</li> <li>3. Check sonar sensors. Refer to <a href="#">SN-29, "Component Function Check"</a>.</li> <li>4. Replace sonar control unit. Refer to <a href="#">SN-38, "Removal and Installation"</a>.</li> </ol>
The sonar system still operates when the sonar system OFF indicator lamp is ON.	<ol style="list-style-type: none"> <li>1. Check sonar system OFF indicator lamp. Refer to <a href="#">SN-32, "Component Function Check"</a>.</li> <li>2. Replace sonar control unit. Refer to <a href="#">SN-38, "Removal and Installation"</a>.</li> </ol>
The sonar sensors do not detect objects within the detectable range (intermittent operation).	<ol style="list-style-type: none"> <li>1. Check sonar sensors. Refer to <a href="#">SN-27, "Preliminary Check"</a> and <a href="#">SN-30, "Component Inspection"</a>.</li> <li>2. Replace sonar control unit. Refer to <a href="#">SN-38, "Removal and Installation"</a>.</li> </ol>
When the sonar system is OFF, the OFF indicator does not light and the sonar buzzer does not sound.	<ol style="list-style-type: none"> <li>1. Check sonar system OFF switch. Refer to <a href="#">SN-32, "Diagnosis Procedure"</a>.</li> <li>2. Check harness and connections for sonar system OFF switch. Refer to <a href="#">SN-29, "Diagnosis Procedure"</a>.</li> <li>3. Replace sonar control unit. Refer to <a href="#">SN-38, "Removal and Installation"</a>.</li> </ol>
When the sonar system is OFF, the OFF indicator lamp does not light but the sonar buzzer does sound.	<ol style="list-style-type: none"> <li>1. Check sonar system OFF indicator lamp. Refer to <a href="#">SN-33, "Component Inspection"</a>.</li> <li>2. Check harness and connections for sonar system OFF indicator lamp. Refer to <a href="#">SN-29, "Diagnosis Procedure"</a>.</li> <li>3. Replace sonar control unit. Refer to <a href="#">SN-38, "Removal and Installation"</a>.</li> </ol>

# SONAR SENSOR

< UNIT REMOVAL AND INSTALLATION >

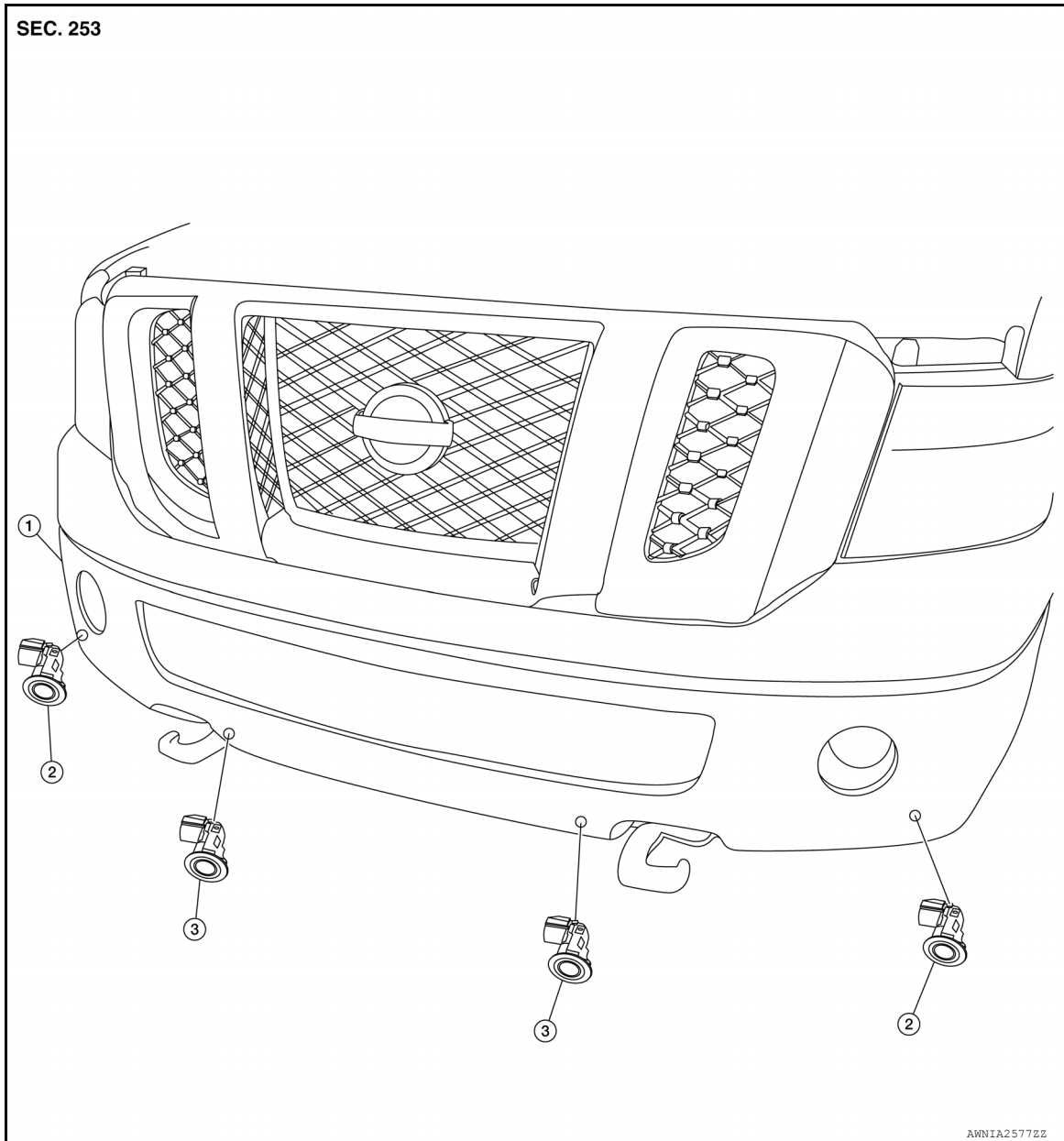
## UNIT REMOVAL AND INSTALLATION

### SONAR SENSOR

#### FRONT SENSOR

#### FRONT SENSOR : Exploded View

INFOID:000000007157557



1. Front bumper

2. Front sonar sensors outer

3. Front sonar sensors inner

#### FRONT SENSOR : Removal and Installation

INFOID:000000006736534

##### REMOVAL

1. Remove the front under cover. Refer to [EXT-38, "Removal and Installation"](#).
2. Disconnect the harness connector from front sonar sensor.

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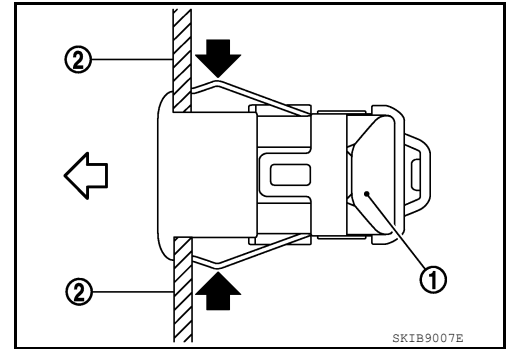
SN

# SONAR SENSOR

## < UNIT REMOVAL AND INSTALLATION >

3. Press the tabs on the top and bottom of the front sonar sensor (1) and push toward the front of the vehicle to remove it from the front bumper (2).

←: Front of vehicle



## INSTALLATION

Installation is in the reverse order of removal.

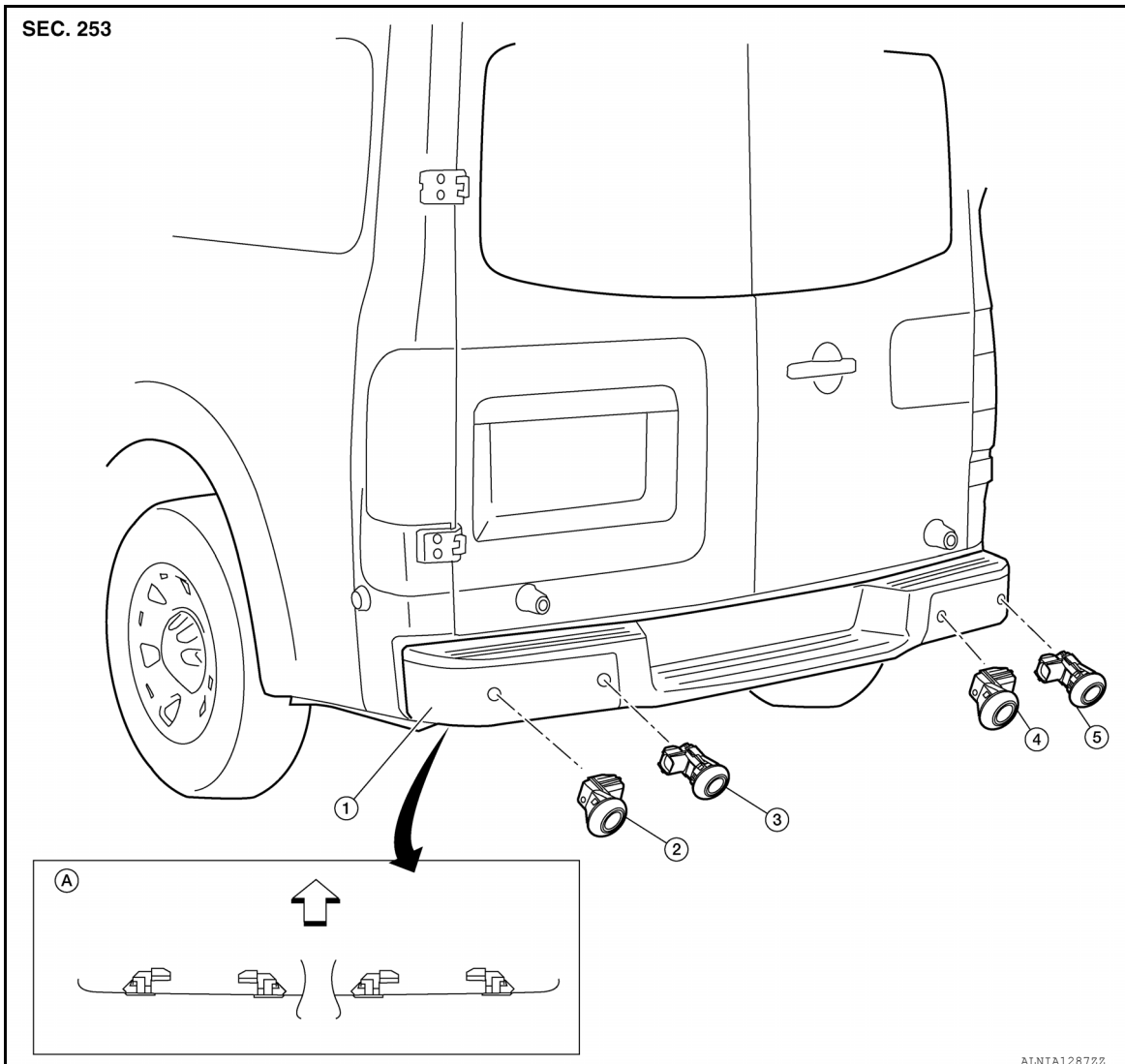
### CAUTION:

- Be sure to install front sonar sensors in the proper direction.
- Do not use hard or sharp objects to install front sonar sensors.
- Do not impact or force front sonar sensors during installation. Gently push the front sonar sensor into the front bumper until it locks into position.

## REAR SENSOR

### REAR SENSOR : Exploded View

INFOID:000000007970669



# SONAR SENSOR

## < UNIT REMOVAL AND INSTALLATION >

- |                               |                               |                                      |   |
|-------------------------------|-------------------------------|--------------------------------------|---|
| 1. Rear bumper                | 2. Rear sonar sensor LH outer | 3. Rear sonar sensor LH inner        | A |
| 4. Rear sonar sensor RH inner | 5. Rear sonar sensor RH outer | A. Sensor direction for installation | B |
- ⇐ Front of vehicle

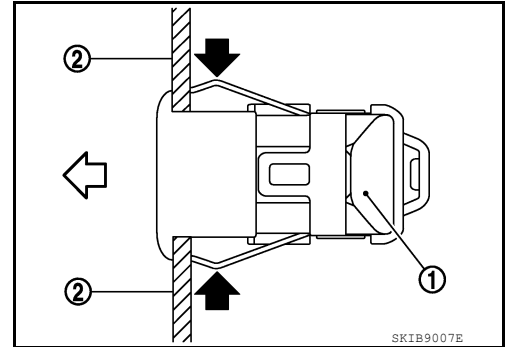
## REAR SENSOR : Removal and Installation

INFOID:000000007970670

### REMOVAL

1. Disconnect the harness connector from rear sonar sensor.
2. Press the tabs on the top and bottom of the rear sonar sensor (1) and push toward the rear of the vehicle to remove it from the rear bumper (2).

⇐: Rear of vehicle



### INSTALLATION

Installation is in the reverse order of removal.

#### CAUTION:

- Be sure to install rear sonar sensors in the proper direction.
- Do not use hard or sharp objects to install rear sonar sensors.
- Do not impact or force rear sonar sensors during installation. Gently push the rear sonar sensor into the rear bumper until it locks into position.

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SN

# SONAR CONTROL UNIT

< UNIT REMOVAL AND INSTALLATION >

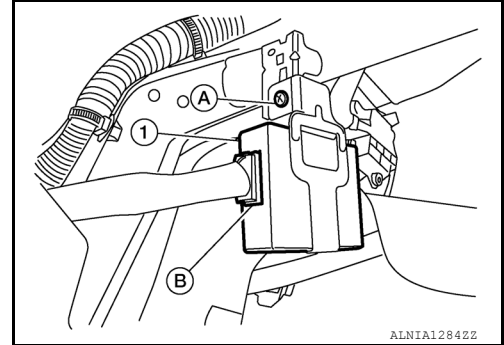
## SONAR CONTROL UNIT

### Removal and Installation

INFOID:000000006736535

#### REMOVAL

1. Remove the instrument lower panel RH and glove box assembly. Refer to [IP-24. "Removal and Installation"](#).
2. Disconnect the harness connector (B) from sonar control unit (1).
3. Remove the sonar control unit screw (A) and the sonar control unit (1).



#### INSTALLATION

Installation is in the reverse order of removal.

# SONAR SYSTEM OFF SWITCH

< UNIT REMOVAL AND INSTALLATION >

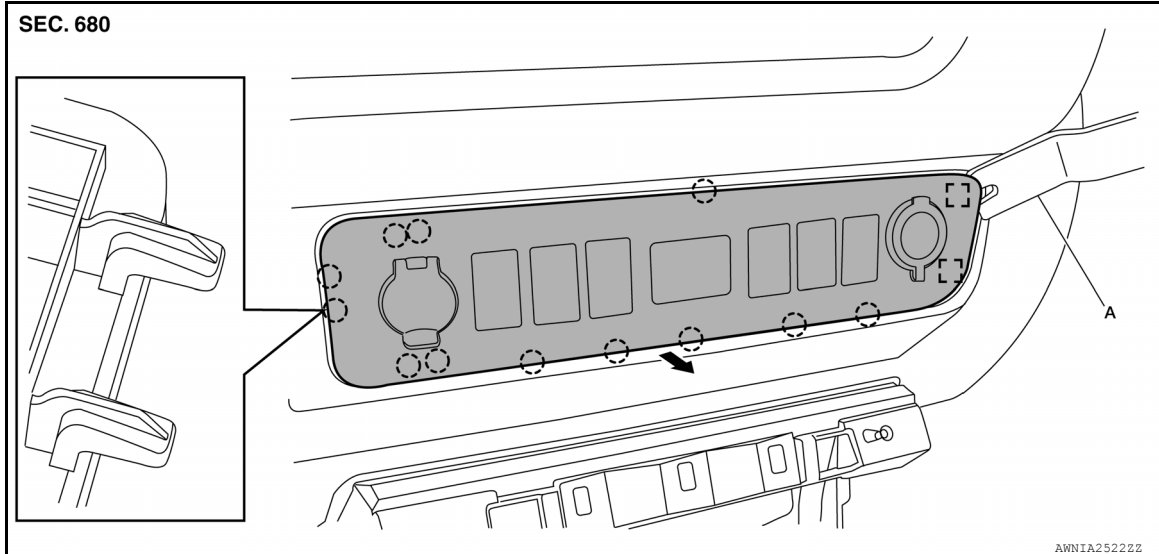
## SONAR SYSTEM OFF SWITCH

### Removal and Installation

INFOID:000000007152475

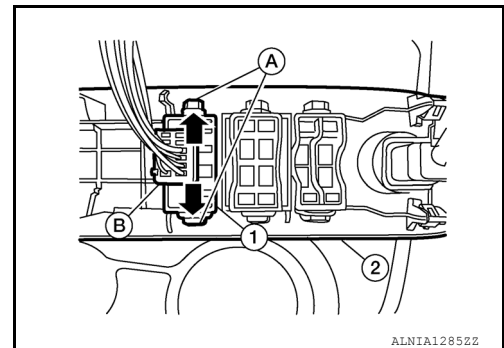
#### REMOVAL

1. Beginning on the RH side of instrument panel switch carrier, release the metal clips and pawls using a suitable tool (A), then reposition the instrument panel switch carrier.



- : Metal clip
- : Pawl

2. Disconnect the harness connector (B) from sonar system OFF switch (1).
3. Release the sonar system OFF switch tabs (A) by pushing outward on the tabs, and remove the sonar system OFF switch (1) from the front of instrument panel switch carrier (2).



#### INSTALLATION

Installation is in the reverse order of removal.

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SN