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# VSP

## SECTION

# APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP)

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# PRECAUTIONS

< PRECAUTION >

## PRECAUTION

### PRECAUTIONS

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

INFOID:000000008139732

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 12V battery, and wait at least 3 minutes before performing any service.

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# PREPARATION

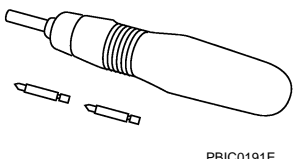
< PREPARATION >

## PREPARATION

### PREPARATION

#### Commercial Service Tools

INFOID:000000008139733

Tool name	Description
<p data-bbox="162 514 267 546">Power tool</p>  <p data-bbox="828 630 901 651">PBIC0191E</p>	<p data-bbox="1006 514 1193 546">Loosening screws</p>

# COMPONENT PARTS

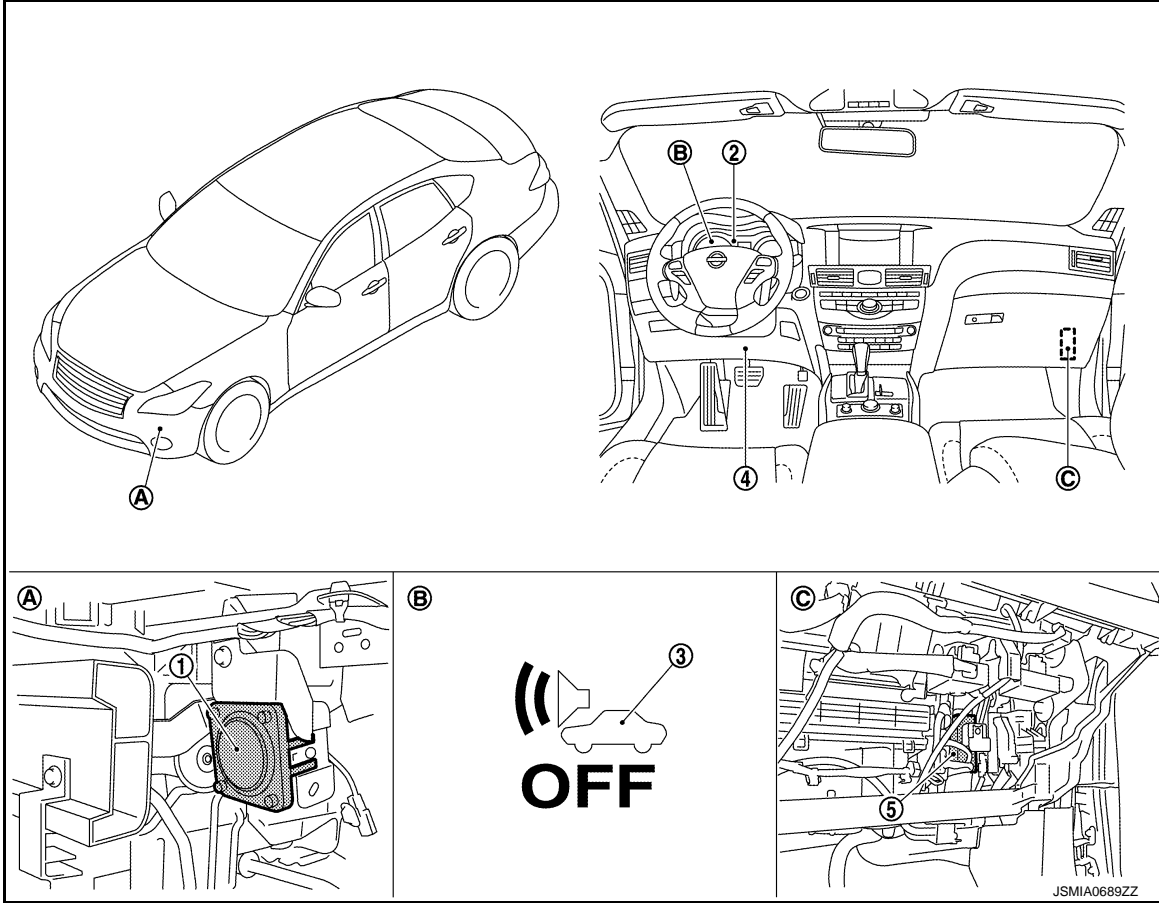
< SYSTEM DESCRIPTION >

## SYSTEM DESCRIPTION

### COMPONENT PARTS

#### Component Parts Location

INFOID:000000008139734



A. Left inside of front bumper

B. In the combination meter

C: Instrument lower panel RH

No.	Component	Description
1.	Approaching vehicle sound for pedestrians (VSP) speaker	Refer to <a href="#">VSP-6, "Approaching Vehicle Sound For Pedestrians (VSP) Speaker"</a> .
2.	Combination meter	<ul style="list-style-type: none"> <li>Transmits the following signals to the VSP control unit via the communication line.                             <ul style="list-style-type: none"> <li>- Ignition signal</li> <li>- Vehicle speed signal</li> <li>- Engine status signal</li> <li>- Shift position signal</li> <li>- Reverse warning buzzer signal</li> </ul> </li> </ul>
3.	Approaching vehicle sound for pedestrians (VSP) OFF indicator	Refer to <a href="#">VSP-6, "Approaching Vehicle Sound For Pedestrians (VSP) OFF Indicator"</a> .
4.	Stop lamp switch	Outputs the stop lamp switch signal to the VSP control unit.
5.	Approaching vehicle sound for pedestrians (VSP) control unit	Refer to <a href="#">VSP-6, "Approaching Vehicle Sound For Pedestrians (VSP) Control Unit"</a> .

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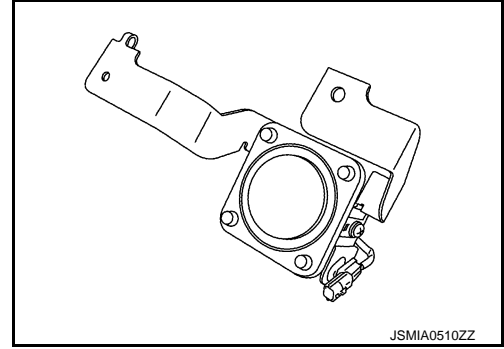
# COMPONENT PARTS

## < SYSTEM DESCRIPTION >

### Approaching Vehicle Sound For Pedestrians (VSP) Speaker

INFOID:000000008139735

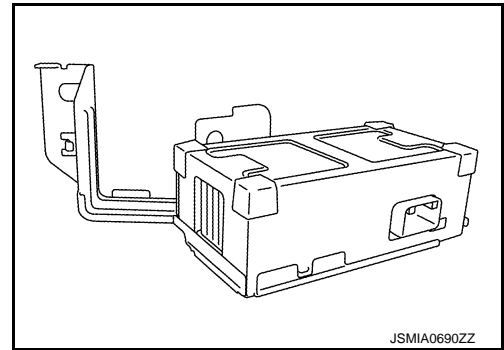
- The VSP speaker is located on the left inside of the front bumper.
- The VSP speaker outputs the approaching vehicle sound for pedestrians (VSP) according to the VSP speaker signal from the VSP control unit.



### Approaching Vehicle Sound For Pedestrians (VSP) Control Unit

INFOID:000000008139736

- The VSP control unit is located inside the instrument lower panel RH.
- The VSP control unit contains a power amplifier for the VSP speaker.
- The VSP control unit controls the VSP system according to the signals from the units and switches.
- When the VSP control unit judges that VSP system and operation is necessary, it outputs the VSP speaker signal to the VSP speaker.

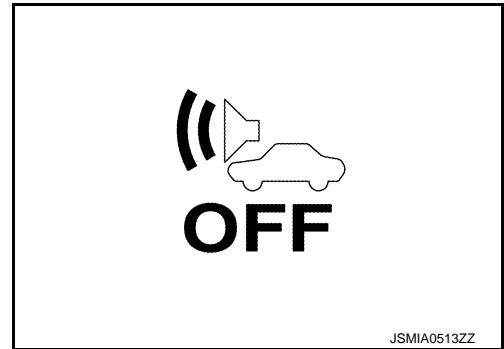


### Approaching Vehicle Sound For Pedestrians (VSP) OFF Indicator

INFOID:000000008139737

- The VSP OFF indicator is located on the combination meter.
- The VSP OFF indicator turns ON and OFF according to the VSP OFF indicator signal from the VSP control unit via communication line.
- The VSP OFF indicator is possible to check the operating status of the VSP system.

VSP system status	VSP OFF indicator
Operate	OFF
Error	ON



# SYSTEM

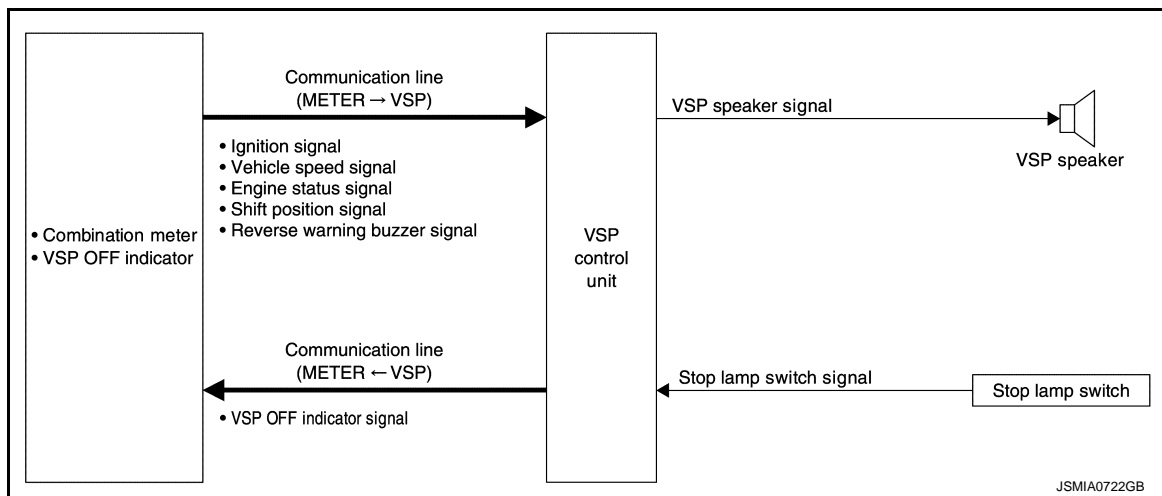
< SYSTEM DESCRIPTION >

## SYSTEM

### System Description

INFOID:000000008139738

### SYSTEM DIAGRAM



### SYSTEM DESCRIPTION

- The approaching vehicle sound for pedestrians (VSP) system activates the VSP speaker during motor driving (engine is stopped), notifying pedestrians that the vehicle is approaching.
- Other than during motor driving (engine is running), VSP system is inactive.
- The VSP control unit is connected to the parts listed below, and it controls VSP system according to the input signals.
  - Combination meter (VSP OFF indicator)
  - Stop lamp switch
  - VSP speaker
- The combination meter sends the following signals to the VSP control unit via communication line.
  - Engine status signal
  - Vehicle speed signal
  - Ignition signal
  - Shift position signal
  - Reverse warning buzzer signal
- The VSP control unit sends the VSP OFF indicator signal to the combination meter via communication line.
- The VSP system consists of the following 3 types.
  - Driving start sound
  - Driving sound
  - Reverse sound
- The VSP OFF indicator turns ON when a malfunction occurs in the VSP system.
- The VSP control unit has a diagnostic function. Diagnosis can be performed using CONSULT.

### DRIVING START SOUND

- The driving start sound operates during motor driving (engine is stopped) when the selector lever is in the “D” position and the brake pedal is released.
- The system switches to the driving sound after the driving start sound time (500 ms) ends.
- Other than during motor driving (engine is running), the driving start sound is inactive.

### Operation Description

- The combination meter sends the following signals to the VSP control unit via the communication line.
  - Ignition signal
  - Shift position signal
  - Engine status signal
  - Vehicle speed signal
  - Reverse warning buzzer signal
- The VSP control unit judges the driving start sound based on the signals input from the combination meter and on the stop lamp switch signal input from the stop lamp switch.
- When the VSP control unit judges that the driving start sound is necessary, it outputs the VSP speaker signal to the VSP speaker.

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# SYSTEM

## < SYSTEM DESCRIPTION >

### Operation Condition

The driving start sound operates when all of the following conditions are met.

Operation condition	
Ignition switch	ON
Selector lever	"D" position
Engine status	Stopped (motor driving)
Vehicle speed	0 km/h (0 MPH)
Brake pedal	Released

### Cancel Condition

The driving start sound operation stops when the following conditions is met.



Cancel condition	
Reverse sound	ON

### NOTE:


The system switches to the driving sound after the driving start sound time (500 ms) ends.

### Signal Path

- The VSP control unit judges operation of the driving start sound function based on the signal shown below, and it operates the driving start sound.

Signal name	Signal path
Ignition signal	Combination meter  VSP control unit
Shift position signal	
Engine status signal	
Vehicle speed signal	
Stop lamp switch signal	Stop lamp switch  VSP control unit

- When the VSP control unit judges that the driving start sound is necessary, it outputs the signal shown below.

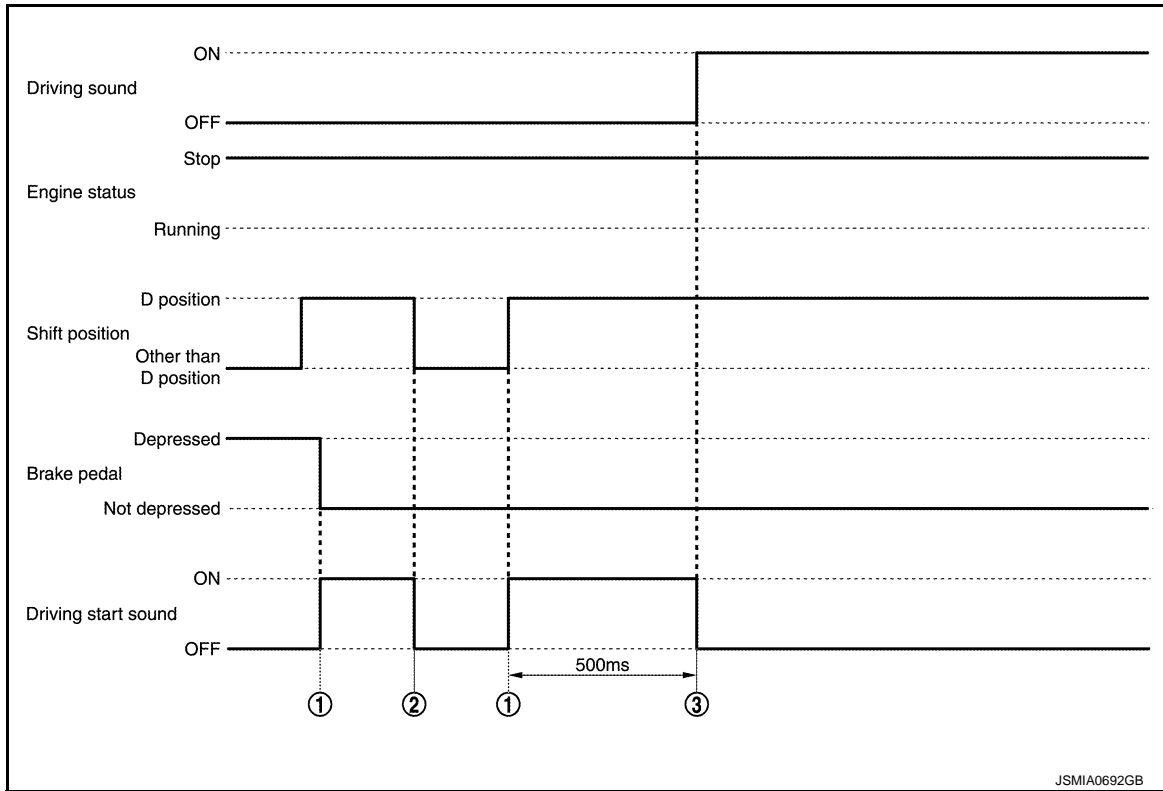
Signal name	Signal path
VSP speaker signal	VSP control unit  VSP speaker



# SYSTEM

## < SYSTEM DESCRIPTION >

### Timing Chart



No.	Description
1.	During motor driving (engine is stopped), the driving start sound activates when the selector lever is in the "D" position and the brake pedal is released.
2.	If the selector lever is moved to a position "R", the driving sound stops.
3.	After the driving start sound operating time (500 ms) ends, the sound changes to the driving sound. <b>NOTE:</b> The driving start sound fades out, and then the driving sound begins.

### DRIVING SOUND

- The driving sound operates according to the vehicle speed during motor driving (engine is stopped) when the vehicle speed is 1 km/h (0.6 MPH) or more.
- The driving sound tone frequency changes in accordance with the vehicle speed.
- When accelerating, the driving sound operates until the speed reaches 30 km/h (19 MPH). When decelerating, the driving sound begins operating at 25 km/h (16 MPH).
- Operation stops when the vehicle is stopped or the vehicle speed reaches 0 km/h (0 MPH).
- Other than during motor driving (engine is running), the driving sound is inactive.

#### Operation Description

- The combination meter sends the following signals to the VSP control unit via the communication line.
  - Engine status signal
  - Vehicle speed signal
  - Shift position signal
- The VSP control unit judges the driving sound based on the signals input from the combination meter.
- When the VSP control unit judges that the driving sound is necessary, it outputs the VSP speaker signal to the VSP speaker.

#### Operation Condition

The driving sound operates when the following conditions are met.

Operation condition	
Engine status	Stopped (motor driving)

# SYSTEM

## < SYSTEM DESCRIPTION >

Operation condition		
Vehicle speed	Accelerating	1 km/h (0.6 MPH) or more
	Decelerating	25 km/h (16 MPH) or less

### Cancel Condition

The driving sound operation stops when the following conditions are met.



Cancel condition		
Engine status		Running (other than motor driving)
Vehicle speed	Accelerating	30 km/h (19 MPH) or more
	Decelerating	Less than 1 km/h (0.6 MPH)
Selector lever		"R" position
		"P" or "N" position *

### NOTE:


When vehicle speed is less than 1 km/h (0.6 MPH).

### Signal Path

- The VSP control unit judges operation of the driving sound function based on the signals shown below, and it operates the driving sound.

Signal name	Signal path
Shift position signal	Combination meter  VSP control unit
Engine status signal	
Vehicle speed signal	
Stop lamp switch signal	Stop lamp switch  VSP control unit

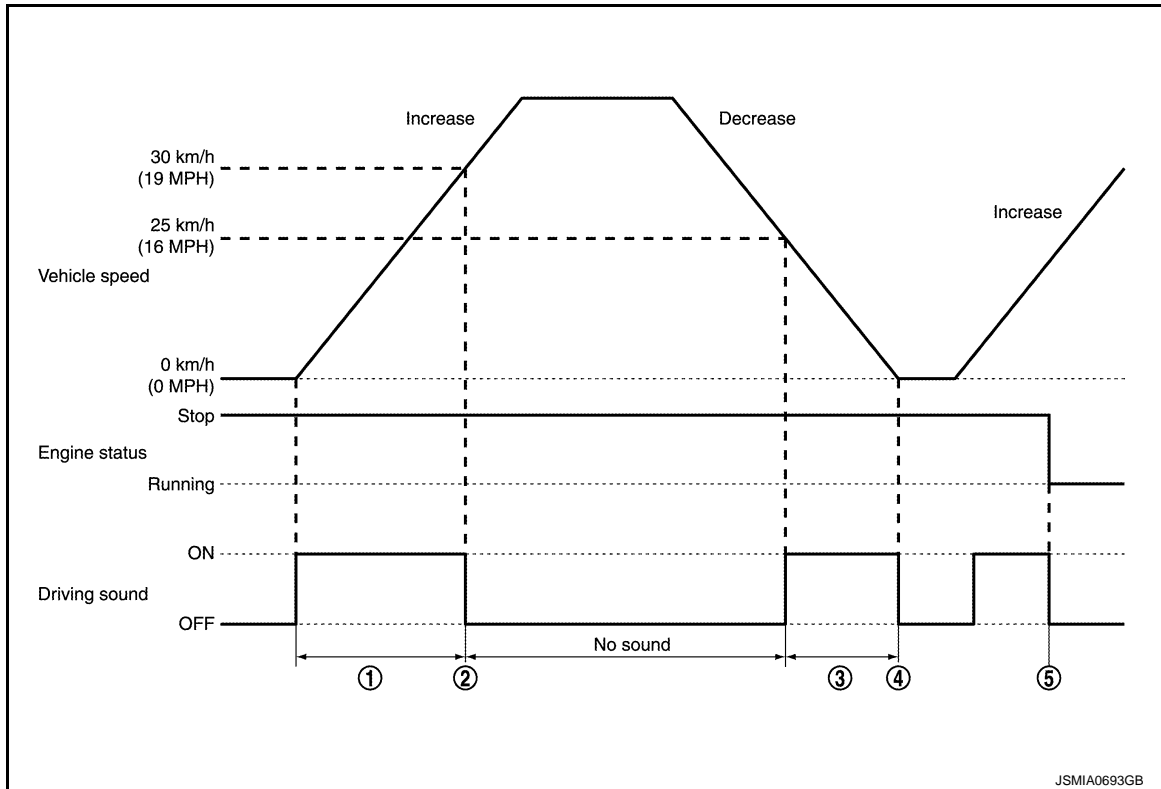
- When the VSP control unit judges that the driving sound is necessary, it outputs the signal shown below.

Signal name	Signal path
VSP speaker signal	VSP control unit  VSP speaker

# SYSTEM

## < SYSTEM DESCRIPTION >

### Timing Chart



No.	Operation contents
1.	The driving sound operates up to approximately 30 km/h (19 MPH) while accelerating [During motor driving (engine is stopped)].
2.	The driving sound stops when approximately 30 km/h (19 MPH) is reached.
3.	The driving sound operates when the speed falls to approximately 25 km/h (16 MPH) or less while decelerating.
4.	The driving sound stops while the vehicle stops (fades out and stops).
5.	Other than during motor driving (engine is running), the driving sound is inactive.

### REVERSE SOUND

- The reverse sound activates during motor driving (engine is stopped) when the selector lever is in the “R” position.
- Other than during motor driving (engine is running), the reverse sound is inactive.

#### Operation Description

- The combination meter sends the following signals to the VSP control unit via the communication line.
  - Shift position signal
  - Reverse warning buzzer signal
- The VSP control unit judges the reverse sound based on the signals input from the combination meter.
- When the VSP control unit judges that the reverse sound is necessary, it outputs the VSP speaker signal to the VSP speaker.

#### Operation Condition

The reverse sound operates when the following conditions are met.

Operation condition	
Engine status	Stopped (motor driving)
Selector lever	“R” position

#### Cancel Condition

The reverse sound operation stops when the following conditions are met.

# SYSTEM

## < SYSTEM DESCRIPTION >

Operation condition	
Engine status	Running (other than motor driving)
Selector lever	Other than "R" position

### Signal Path

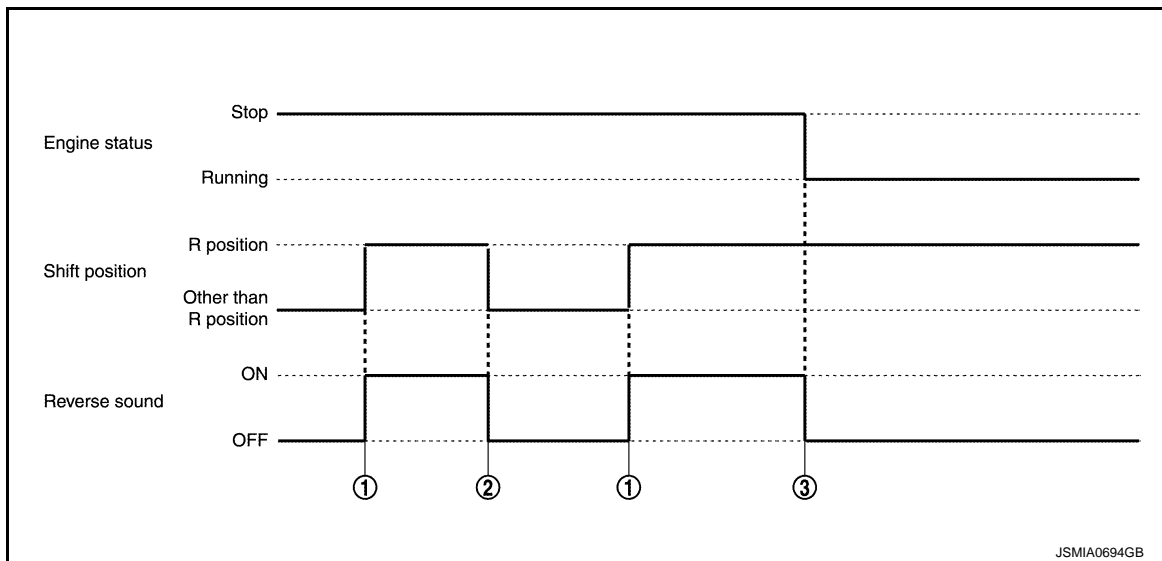
- The VSP control unit judges operation of the reverse sound based on the signals shown below, and operates the driving sound.

Signal name	Signal path
Engine status signal	Combination meter <b>COMM</b> → VSP control unit
Shift position signal	
Reverse warning buzzer signal	

- When the VSP control unit judges that the reverse sound is necessary, it outputs the signal shown below.

Signal name	Signal path
VSP speaker signal	VSP control unit → VSP speaker

### Timing Chart



No.	Operation contents
1.	The reverse sound operates during motor driving (engine is stopped) when the selector lever is moved to the "R" position (the reverse warning buzzer signal is received).
2.	The reverse sound stops when selector lever is shifted to any position other than "R" position.
3.	Other than during motor driving (engine is running), the reverse sound is inactive.

### VSP SYSTEM MALFUNCTION DETECTION FUNCTION

When a malfunction in the VSP system is detected, the VSP OFF indicator turns ON.

### Signal Path

- When the VSP control unit detects a VSP system malfunction, it sends the VSP OFF indicator signal to the combination meter via the communication line.
- The combination meter turns the VSP OFF indicator ON/OFF when the signal shown below is input.

Signal name	Signal path
VSP OFF indicator signal	VSP control unit <b>COMM</b> → combination meter

# SYSTEM

## < SYSTEM DESCRIPTION >

### Fail-Safe

INFOID:000000008139739

The VSP control unit performs fail-safe control when a communication error with the combination meter is detected.

System	Specifications
Driving start sound	Function stops by communication disruption.
Driving sound	
Reverse sound	

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VSP

# DIAGNOSIS SYSTEM (VSP)

< SYSTEM DESCRIPTION >

## DIAGNOSIS SYSTEM (VSP)

### CONSULT Function

INFOID:000000008139740

#### APPLICATION ITEM

CONSULT can display each diagnostic item using the diagnostic test modes shown as per the following:

Test mode	Function
Self Diagnostic Results	VSP control unit checks the conditions and displays memorized error.
Data Monitor	VSP control unit input/output data in real time.
Active Test	Gives a drive signal to a load to check the operation.

#### SELF-DIAGNOSTIC RESULTS

For details, refer to [VSP-18, "DTC Index"](#).

#### DATA MONITOR

##### NOTE:

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

Monitor item	Display	Description
IGNITION SW	On	Ignition switch status input from the ignition switch supply.
	Off	
BRAKE SW	On	Stop lamp switch status input from the stop lamp switch.
	Off	
VSP OFF SW	Off	This item is displayed, but cannot be monitored.
PUSH SW	Off	This item is displayed, but cannot be monitored.
VCM INPUT SIG	Off	This item is displayed, but cannot be monitored.
READY OP IND SIG	On	READY to drive indicator lamp status input from the combination meter via the communication line.
	Off	
IGN STATS SIG	On	Ignition switch status input from the combination meter via the communication line.
	Off	
VEHICLE SPEED	0 - 63 km/h	Vehicle speed signal value input from the combination meter via the communication line. <b>NOTE:</b> 63 km/h (39.1 MPH) or faster is fixed at 63 km/h (39.1 MPH).
ENG STATUS SIG	Off	Engine status input from the combination meter via the communication line.
SOUND SET REQ	Off	This item is displayed, but cannot be monitored.
SOUND	Off	This item is displayed, but cannot be monitored.
SHIFT POS SIG	P or N	The shift position status input from the combination meter via the communication line.
	R	
	D or B	
REVERSE BUZZER	On	Reverse warning buzzer status input from the combination meter via the communication line.
	Off	

#### ACTIVE TEST

# DIAGNOSIS SYSTEM (VSP)

## < SYSTEM DESCRIPTION >

Active test item	Function	
VSP SPEAKER	The VSP speaker operation can be checked. <b>NOTE:</b> Activates the reverse sound at a higher sound level than normal operation.	A B
START UP SOUND SPEAKER	This item is displayed, but cannot be monitored.	
VSP IND	This item is displayed, but cannot be monitored.	C

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# APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

## ECU DIAGNOSIS INFORMATION

### APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) CONTROL UNIT

#### Reference Value

INFOID:000000008139741

#### VALUES ON THE DIAGNOSIS TOOL

##### NOTE:

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

#### CONSULT MONITOR ITEM

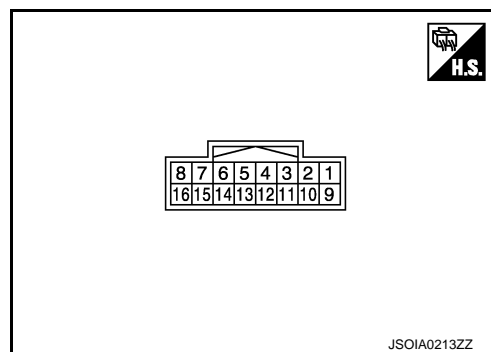
Monitor item	Condition		Value/Status
IGNITION SW	Power switch ON	Ignition switch ON position	On
		Ignition switch other than position	Off
BRAKE SW	Power switch ON	When brake pedal is depressed (stop lamp switch OFF)	On
		When brake pedal is not depressed (stop lamp switch ON)	Off
VSP OFF SW	Power switch ON	<b>NOTE:</b> This item is displayed, but cannot be monitored.	Off
PUSH SW	Power switch ON	<b>NOTE:</b> This item is displayed, but cannot be monitored.	Off
VCM INPUT SIG	Power switch ON	<b>NOTE:</b> This item is displayed, but cannot be monitored.	Off
READY OP IND SIG	Power switch ON	READY to drive indicator lamp ON	On
		READY to drive indicator lamp OFF	Off
IGN STATUS SIG	Power switch ON	Ignition switch ON position	On
		Ignition switch other than position	Off
VEHICLE SPEED	Power switch ON	While driving	Approximately equal to speedometer reading <b>NOTE:</b> Indicates 63 km/h (39.1 MPH) when speed is 63 km/h (39.1 MPH) or higher.
ENG STATUS SIG	Power switch ON	Engine running	On
		Engine stopped	Off
SOUND SET REQ	Power switch ON	<b>NOTE:</b> This item is displayed, but cannot be monitored.	On
SOUND	Power switch ON	<b>NOTE:</b> This item is displayed, but cannot be monitored.	4
SHIFT POSITION SIGNAL	Power switch ON	Selector lever is in "P" or "N" position.	P or N
		Selector lever is in "R" position.	R
		Selector lever is in "D" position.	D or B
REVERSE BUZZER	Power switch ON	Reverse warning buzzer operating	On
		Reverse warning buzzer not operating	Off



# APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

## TERMINAL LAYOUT



## PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	-	Signal name	Input/ Output			
1 (B)	Ground	Ground	—	Power switch ON	—	0 V
2 (BG)	Ground	Communication signal (METER → VSP)	Input	Power switch ON	—	<p><b>NOTE:</b> Waveform shows reference values.</p> <p>0 - 12 V</p>
4 (GR)	Ground	Communication signal (VSP → METER)	Output	Power switch ON	—	<p><b>NOTE:</b> Waveform shows reference values.</p> <p>0 - 12 V</p>
8 (LG)	7 (BR)	VSP speaker signal	Output	Power switch ON	When VSP speaker is out- put.	<p><b>NOTE:</b> Waveform varies depending on tone and sound level.</p>
10 (V)	—	K- line (CONSULT)	—	—	—	—
11 (R)	Ground	Ignition signal	Input	Power switch ON	—	Battery voltage

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# APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) CONTROL UNIT

## < ECU DIAGNOSIS INFORMATION >

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	-	Signal name	Input/ Output			
12 (P)	Ground	Stop lamp switch signal	Input	Power switch ON	When brake pedal is not depressed	0 V
					When the brake pedal is depressed	12 V
13 (W)	Ground	Battery power supply	Input	Power switch OFF	—	Battery voltage

## Fail-Safe

INFOID:000000008139742

The VSP control unit performs fail-safe control when a communication error with the combination meter is detected.

System	Specifications
Driving start sound	Function stops by communication disruption.
Driving sound	
Reverse sound	

## DTC Index

INFOID:000000008139743

Display item [Code]	Malfunction is detected when...	Reference
COMM CIRCUIT [U1431]	Communications signal from combination meter could not be received continuously for 2 seconds or more (when ignition switch ON).	<a href="#">VSP-22</a>

# APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) SYSTEM


< WIRING DIAGRAM >

## WIRING DIAGRAM

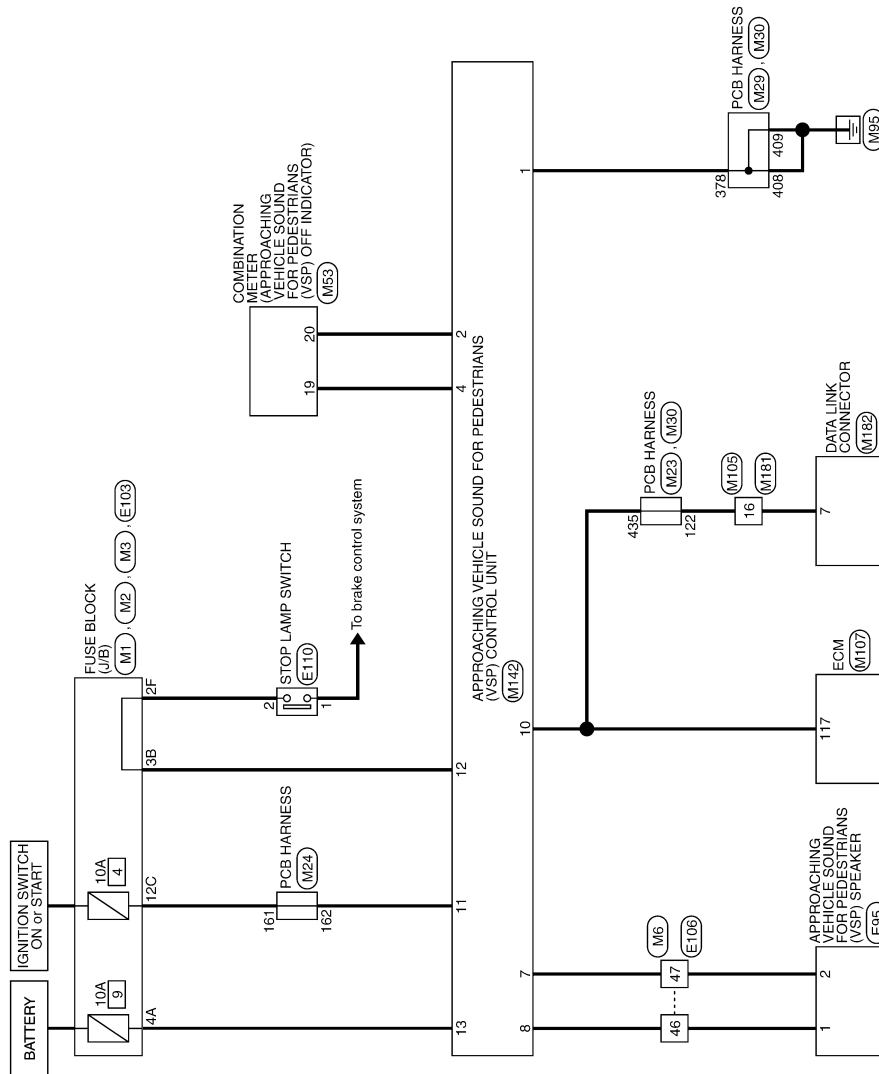
### APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) SYSTEM

#### Wiring Diagram

INFOID:000000008139744

For connector terminal arrangements, harness layouts, and alphabets in a  (option abbreviation; if not described in wiring diagram), refer to [GI-13. "Connector Information"](#).

#### APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) SYSTEM



2012/02/29

JRMWC9986GB

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VSP

# DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

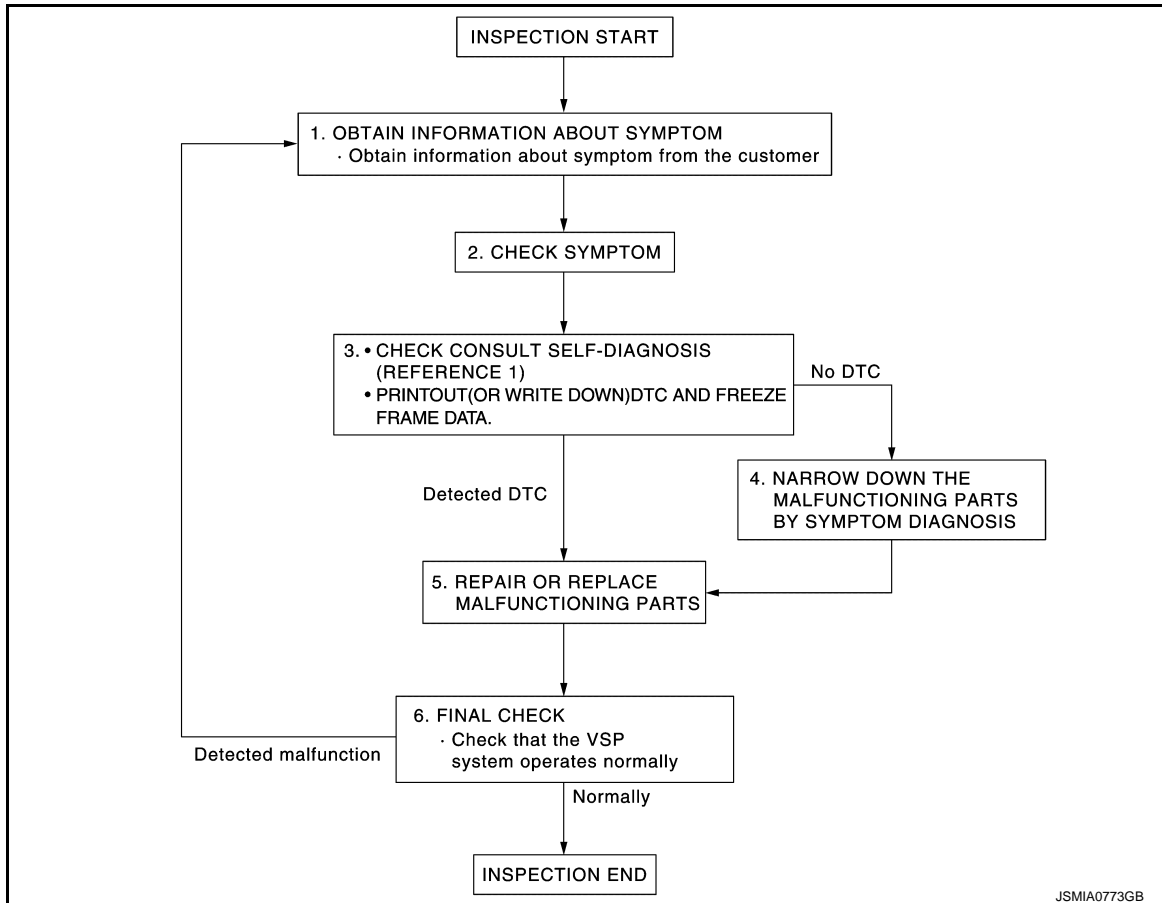
## BASIC INSPECTION

### DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000008139745

#### OVERALL SEQUENCE



Reference 1...[VSP-18, "DTC Index"](#).

#### DETAILED FLOW

##### 1.OBTAIN INFORMATION ABOUT SYMPTOM

Interview the customer to obtain as much information as possible about the conditions and environment under which the malfunction occurred.

>> GO TO 2.

##### 2.CHECK SYMPTOM

- Check the symptom based on the information obtained from the customer.
- Check if any other malfunctions are present.

>> GO TO 3.

##### 3.CHECK CONSULT SELF-DIAGNOSIS RESULTS

1. Connect CONSULT and perform self-diagnosis. Refer to [VSP-18, "DTC Index"](#).
2. When DTC is detected, follow the instructions below:
  - Record DTC and Freeze Frame Data.

Are self-diagnosis results normal?

YES >> GO TO 5.

# DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

---

NO >> GO TO 4.

## 4.NARROW DOWN MALFUNCTIONING PARTS BY SYMPTOM DIAGNOSIS

---

Perform symptom diagnosis and narrow down the malfunctioning parts.

>> GO TO 5.

## 5.REPAIR OR REPLACE MALFUNCTIONING PARTS

---

Repair or replace malfunctioning parts.

**NOTE:**

If DTC is displayed, erase DTC after repairing or replacing malfunctioning parts.

>> GO TO 6.

## 6.FINAL CHECK

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Check that the VSP system operates normally.

Does it operate normally?

YES >> INSPECTION END

NO >> GO TO 1.

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VSP

# U1431 COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

## DTC/CIRCUIT DIAGNOSIS

### U1431 COMM CIRCUIT

#### Description

INFOID:000000008139746

The communications line (METER → VSP) sends signals needed for VSP system control from the combination meter.

#### DTC Logic

INFOID:000000008139747

#### DTC DETECTION LOGIC

DTC	Display contents of CONSULT	Diagnostic item is detected when...	Probable malfunction location
U1431	COMM CIRCUIT	Communications signal from combination meter could not be received continuously for 2 seconds or more (when ignition switch ON).	Communication line (METER → VSP)

#### Diagnosis Procedure

INFOID:000000008139748

### 1. CHECK COMMUNICATION LINE (METER → VSP) SIGNAL CIRCUIT

1. Ignition switch OFF
2. Disconnect VSP control unit and combination meter connector.
3. Check continuity between VSP control unit harness connector and combination meter harness connector.

VSP control unit		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	
M142	2	M53	20	Existed

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

VSP control unit		Ground	Continuity
Connector	Terminal		
M142	2		Not existed

Is the inspection result normal?

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

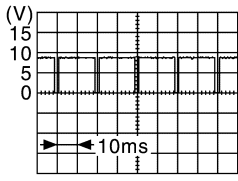
### 2. CHECK COMMUNICATION LINE (METER → VSP) INPUT SIGNAL

1. Connect VSP control unit and combination meter connector.
2. Ignition switch ON.
3. Check voltage between VSP control unit harness connector and ground.

Terminal		Voltage (Approx.)
(+)	(-)	
VSP control unit		
Connector	Terminal	

# U1431 COMM CIRCUIT

## < DTC/CIRCUIT DIAGNOSIS >

M142	2	Ground	<p><b>NOTE:</b> Waveform shows reference values.</p>  <p>JSMIA0536GB 0 - 12 V</p>
------	---	--------	---

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace combination meter. Refer to [MWI-81, "Removal and Installation"](#).

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VSP

# POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

## POWER SUPPLY AND GROUND CIRCUIT

### APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) CONTROL UNIT

### APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) CONTROL UNIT :

#### Diagnosis Procedure

INFOID:000000008139749

#### 1. CHECK FUSE

Check for blown fuses.

Power source	Fuse No.
Battery power supply	9
Ignition switch ON or START	4

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. Ignition switch ON.
2. Check voltage between VSP control unit harness connector and ground.

Signal name	Connector No.	Terminal No.	Ignition switch position	Value (Approx.)
Battery power supply	M142	13	OFF	Battery voltage
Ignition switch ON or START		11	ON	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

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

#### 3. CHECK GROUND CIRCUIT

1. Ignition switch OFF.
2. Disconnect VSP control unit connector.
3. Check continuity between VSP control unit harness connector and ground.

VSP control unit		Ground	Continuity
Connector	Terminal		
M142	1		Existed

Is the inspection result normal?

YES >> INSPECTION END

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



# APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) SPEAKER SIGNAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

## APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) SPEAKER SIGNAL CIRCUIT

### Description

INFOID:000000008139750

The VSP control unit outputs the VSP speaker signal to the VSP speaker.

### Component Function Check

INFOID:000000008139751

#### 1. CHECK VSP SPEAKER OPERATION

1. Connect the CONSULT.
2. Select the "ACTIVE TEST" for the "VSP" and perform the "VSP SPEAKER".

>> INSPECTION END

### Diagnosis Procedure

INFOID:000000008139752

#### 1. CHECK VSP SPEAKER SIGNAL CIRCUIT

1. Ignition switch OFF.
2. Disconnect VSP control unit and VSP speaker connector.
3. Check continuity between VSP control unit harness connector and VSP speaker harness connector.

VSP control unit		VSP speaker		Continuity
Connector	Terminal	Connector	Terminal	
M142	7	E95	2	Existed
	8		1	

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

VSP control unit		Ground	Continuity
Connector	Terminal		
M142	7		Not existed
	8		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair harness or connector.

#### 2. CHECK VSP SPEAKER OUTPUT SIGNAL

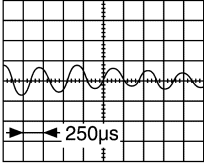
1. Connect VSP control unit and VSP speaker connector.
2. Ignition switch ON.
3. Check signal between VSP control unit harness connector.

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VSP

# APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) SPEAKER SIGNAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

Terminals				Voltage (Approx.)
(+) Terminal		(-) Terminal		
VSP control unit				
Connector	Terminal	Connector	Terminal	
M142	8	M142	7	<p><b>NOTE:</b> Waveform varies depending on tone and sound level.</p>  <p style="text-align: right; font-size: small;">JSMIA0539GB</p>

Is the inspection result normal?

YES >> INSPECTION END

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

# COMMUNICATION SIGNAL (VSP → METER) CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

## COMMUNICATION SIGNAL (VSP → METER) CIRCUIT

### Description

INFOID:000000008139753

The communications line (VSP → METER) sends signals needed for VSP system control from the combination meter.

### Diagnosis Procedure

INFOID:000000008139754

#### 1. CHECK COMMUNICATION LINE (VSP → METER) SIGNAL CIRCUIT

1. Ignition switch OFF
2. Disconnect VSP control unit and combination meter connector.
3. Check continuity between VSP control unit harness connector and combination meter harness connector.

VSP control unit		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	
M142	4	M53	19	Existed

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

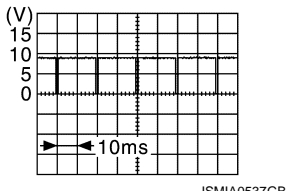
VSP control unit		Ground	Continuity
Connector	Terminal		
M142	4		Not existed

Is the inspection result normal?

- YES >> GO TO 2.  
 NO >> Repair the harnesses or connector.

#### 2. CHECK COMMUNICATION LINE (VSP → METER) OUTPUT SIGNAL

1. Connect VSP control unit and combination meter connector.
2. Ignition switch ON.
3. Check voltage between VSP control unit harness connector and ground.

Terminal		(-)	Voltage (Approx.)
(+)			
VSP control unit			
Connector	Terminal		
M142	4	Ground	<p><b>NOTE:</b> Waveform shows reference values.</p>  <p>0 - 12 V</p>

Is the inspection result normal?

- YES >> INSPECTION END  
 NO >> Replace the VSP control unit. Refer to [VSP-35. "Removal and Installation"](#).

# STOP LAMP SWITCH SIGNAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

## STOP LAMP SWITCH SIGNAL CIRCUIT

### Description

INFOID:000000008139755

The Stop lamp switch outputs the stop lamp switch signal to the VSP control unit.

### Component Function Check

INFOID:000000008139756

#### 1. CHECK STOP LAMP SWITCH INPUT SIGNAL

1. Connect the CONSULT.
2. Select the "DATA MONITOR" for the "VSP" and check the "BRAKE SW" monitor value.

	"BRAKE SW"
When brake pedal is not depressed	: Off
When brake pedal is depressed	: On

>> INSPECTION END

### Diagnosis Procedure

INFOID:000000008139757

#### 1. CHECK STOP LAMP SWITCH SIGNAL CIRCUIT

1. Ignition switch OFF.
2. Disconnect VSP control unit connector and stop lamp switch connector.
3. Check continuity between VSP control unit harness connector and stop lamp switch harness connector.

VSP control unit		Stop lamp switch		Continuity
Connector	Terminal	Connector	Terminal	
M142	12	E110	2	Existed

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

VSP control unit		Ground	Continuity
Connector	Terminal		
M142	12		Not existed

Is the inspection result normal?

- YES >> GO TO 2.  
NO >> Repair the harnesses or connector.

#### 2. CHECK STOP LAMP SWITCH INPUT SIGNAL

1. Connect VSP control unit and stop lamp switch connector.
2. Ignition switch ON.
3. Check voltage between VSP control unit harness connector and ground.

Terminals		Condition	Voltage (Approx.)
(+)	(-)		
VSP control unit		When brake pedal is depressed	12 V
Connector	Terminal		
M142	12	When brake pedal is not depressed	0 V

Is the inspection result normal?

- YES >> Replace the VSP control unit. Refer to [VSP-35. "Removal and Installation"](#).  
NO >> Refer to [VSP-29. "Component Inspection"](#).

# STOP LAMP SWITCH SIGNAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

## Component Inspection

INFOID:000000008139758

### 1. CHECK STOP LAMP SWITCH

1. Ignition switch OFF.
2. Disconnect stop lamp switch connector.
3. Check continuity between following terminals of the stop lamp switch.

Terminals		Condition	Continuity
1	2	When brake pedal is depressed	Existed
		When brake pedal is not depressed	Not existed

Is the inspection result normal?

- YES >> INSPECTION END  
NO >> Replace stop lamp switch.

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VSP

# APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

## SYMPTOM DIAGNOSIS

### APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) SYSTEM SYMPTOMS

#### Symptom Table

INFOID:000000008139759

Symptoms	Check items	Possible malfunction location/Action to take
No sound from VSP speaker	Input signals from combination meter are normal.	<ul style="list-style-type: none"><li>• VSP speaker</li><li>• VSP speaker signal circuit</li></ul> Refer to <a href="#">VSP-33, "Diagnosis Procedure"</a> .
Driving start sound does not sound.	Driving sound and reverse sound operate.	Stop lamp switch signal circuit Refer to <a href="#">VSP-32, "Diagnosis Procedure"</a> .
VSP OFF indicator does not turn ON or does not turn OFF.	—	VSP OFF indicator signal circuit Refer to <a href="#">VSP-31, "Diagnosis Procedure"</a> .

# THE APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) OFF INDICATOR DOES NOT TURN ON OR OFF

< SYMPTOM DIAGNOSIS >

## THE APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) OFF INDICATOR DOES NOT TURN ON OR OFF

### Description

INFOID:000000008139760

- When there is a malfunction in the VSP system, the VSP OFF indicator does not turn ON.
- When the VSP system is operating normally, the VSP OFF indicator turns ON.

### Diagnosis Procedure

INFOID:000000008139761

#### 1. CHECK COMMUNICATION LINE (VSP → METER) SIGNAL CIRCUIT

Check communication line (VSP → METER) signal circuit. Refer to [VSP-27, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> Replace combination meter. Refer to [MWI-81, "Removal and Installation"](#).  
NO >> Repair harness or connector.

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VSP

# THE DRIVING SOUND DOES NOT SOUND

< SYMPTOM DIAGNOSIS >

---

## THE DRIVING SOUND DOES NOT SOUND

### Description

INFOID:000000008139762

The driving start sound does not operate during motor driving (engine is stopped) when the selector lever is in the "D" position and the brake pedal is released.

#### NOTE:

The driving sound and reverse sound operate.

### Diagnosis Procedure

INFOID:000000008139763

#### 1. CHECK STOP LAMP SWITCH INPUT SIGNAL

---

1. Connect the CONSULT.
2. Check the stop lamp switch input signal. Refer to [VSP-28. "Component Function Check"](#).

Is the inspection result normal?

- YES >> Replace the VSP control unit. Refer to [VSP-35. "Removal and Installation"](#).
- NO >> GO TO 2.

#### 2. CHECK STOP LAMP SWITCH SIGNAL CIRCUIT

---

Check the stop lamp switch signal circuit. Refer to [VSP-28. "Diagnosis Procedure"](#).

Is the inspection result normal?

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

#### 3. CHECK STOP LAMP SWITCH

---

Check stop lamp switch. Refer to [VSP-29. "Component Inspection"](#).

Is the inspection result normal?

- YES >> Replace the VSP control unit. Refer to [VSP-35. "Removal and Installation"](#).
- NO >> Replace stop lamp switch.



# THE APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) SPEAKER DOES NOT SOUND

< SYMPTOM DIAGNOSIS >

## THE APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) SPEAKER DOES NOT SOUND

### Description

INFOID:000000008139764

The driving start sound, driving sound and reverse sound all do not operate.

#### NOTE:

The VSP OFF indicator operates normally.

### Diagnosis Procedure

INFOID:000000008139765

#### 1. CHECK VSP SPEAKER OPERATION

1. Connect the CONSULT.
2. Select "VSP SP" of "ACTIVE TEST"
3. Check the VSP speaker operation. Refer to [VSP-25, "Component Function Check"](#).

Is the inspection result normal?

- YES >> Replace the VSP control unit. Refer to [VSP-35, "Removal and Installation"](#).  
NO >> GO TO 2.

#### 2. CHECK VSP CONTROL UNIT POWER SUPPLY CIRCUIT

Check VSP control unit power supply circuit. Refer to [VSP-24, "APPROACHING VEHICLE SOUND FOR PEDESTRIANS \(VSP\) CONTROL UNIT : Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> GO TO 3.  
NO >> Repair or replace VSP control unit power supply harness.

#### 3. CHECK VSP SPEAKER SIGNAL CIRCUIT

Check VSP speaker signal circuit. Refer to [VSP-25, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> Replace the VSP speaker. Refer to [VSP-37, "Removal and Installation"](#).  
NO >> Repair harness or connector.

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VSP

## NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

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### NORMAL OPERATING CONDITION

#### Description

INFOID:000000008139766

- The VSP during forward driving fades out and stops operating when the vehicle stops [vehicle speed 0 km/h (0 MPH) is detected].
- The VSP during reverse driving continues to operate when the vehicle is stopped.

# APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) CONTROL UNIT

< REMOVAL AND INSTALLATION >

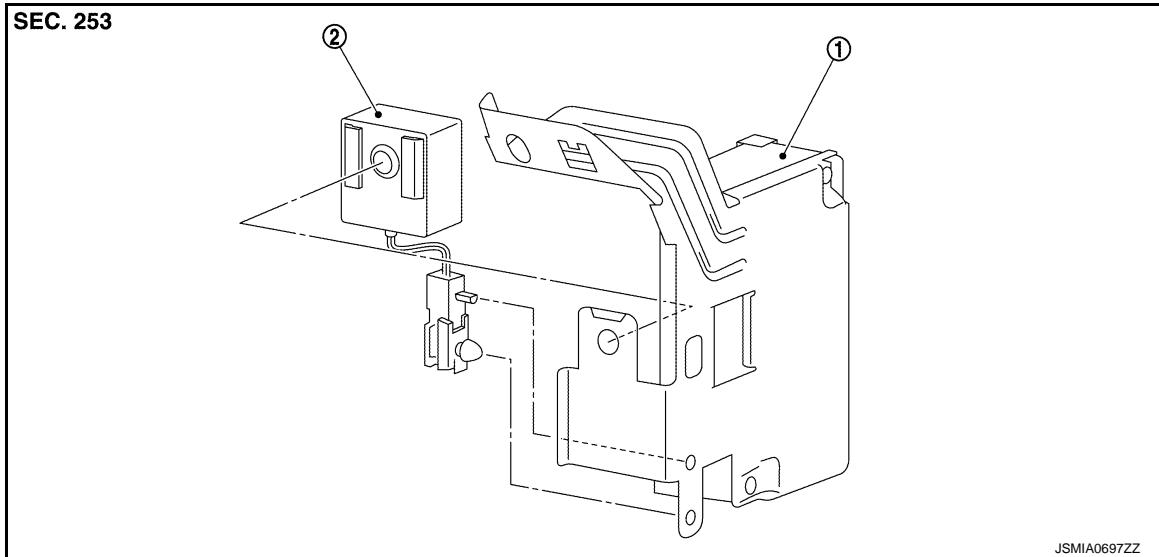
## REMOVAL AND INSTALLATION

### APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) CONTROL UNIT

Exploded View

INFOID:000000008139767

DISASSEMBLY



1. VSP control unit

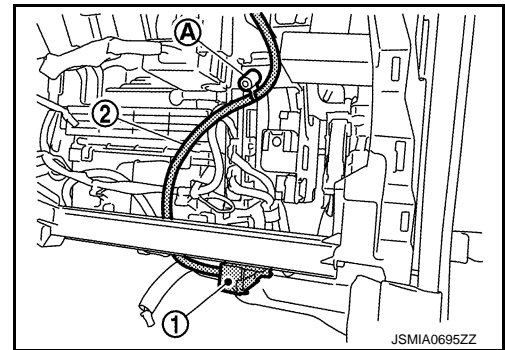
2. Warning buzzer

### Removal and Installation

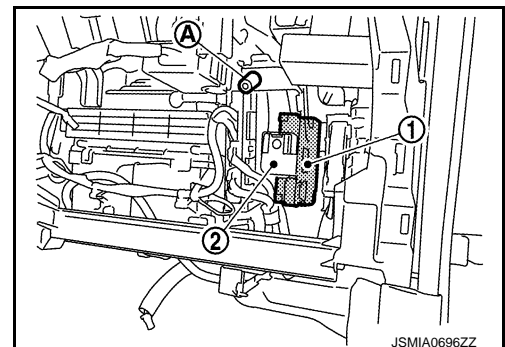
INFOID:000000008139768

#### REMOVAL

1. Remove the Instrument lower panel RH. Refer to [IP-13, "Removal and Installation"](#).
2. Disconnect the tube (2) from the aroma unit (1) (models with Forest Air system).
3. Pull the tube (2) out from clamp (A) to remove it (models with Forest Air system).
4. Turn the clamp (A) to remove it (models with Forest Air system).



5. Remove the installation nut (A), and then remove the VSP control unit (1) and warning buzzer (2) as a set.



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# **APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) CONTROL UNIT**

## **< REMOVAL AND INSTALLATION >**

---

6. Disconnect the VSP control unit connector and warning buzzer connector.

### **INSTALLATION**

Install in the reverse order of removal.

# APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) SPEAKER

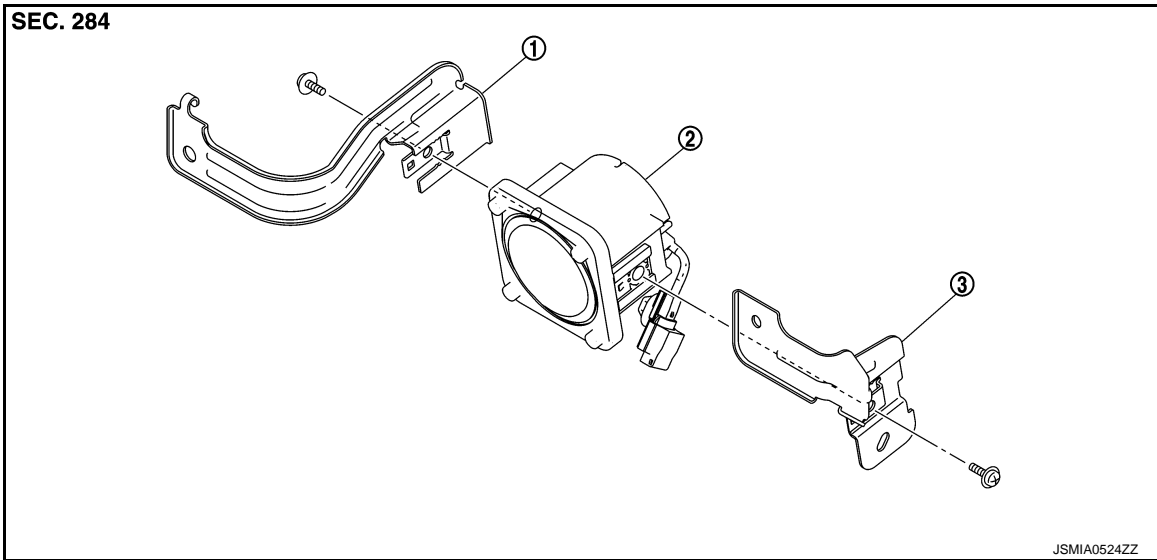
< REMOVAL AND INSTALLATION >

## APPROACHING VEHICLE SOUND FOR PEDESTRIANS (VSP) SPEAKER

Exploded View

INFOID:000000008139769

DISASSEMBLY



1. Bracket RH

2. VSP speaker

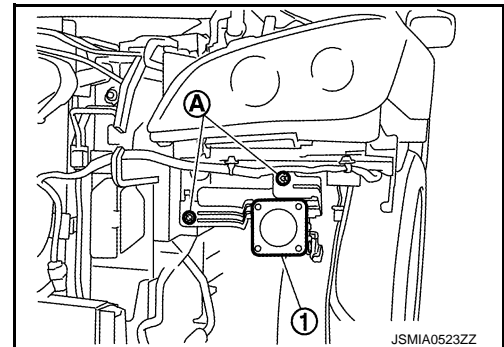
3. Bracket LH

### Removal and Installation

INFOID:000000008139770

#### REMOVAL

1. Remove the front bumper and bumper reinforcement. Refer to [IP-13. "Removal and Installation"](#).
2. Remove the VSP speaker connector.
3. Remove bolts (A), and then remove the VSP speaker (1).



#### INSTALLATION

Install in the reverse order of removal.

#### Disassembly and Assembly

INFOID:000000008139771

#### DISASSEMBLY

Remove screws, and then remove bracket.

#### ASSEMBLY

Assemble in the reverse order of disassembly.

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