SECTION SN
SONAR SYSTEM

CONTENTS

PRECAUTION

PRECAUTION

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

INFOID:0000000014386728

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. 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, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper repair, 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 Air Bag Diagnosis Sensor Unit or other Air Bag 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 or batteries, and wait at least three minutes before performing any service.**

Precaution for Work

INFOID:0000000014386729

- 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 a 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, wring the water out of the cloth and wipe the dirty area.
- Then rub with a soft, 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, wring the water out of the cloth and wipe the detergent off.
- Then rub with a soft, 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

PREPARATION

Special Service Tool

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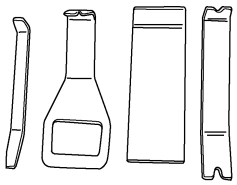
The actual shape of the tools may differ from those illustrated here.

Tool number (TechMate No.) Tool name	Description
— (J-46534) Trim Tool Set  AWJIA0483ZZ	Removing trim components

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

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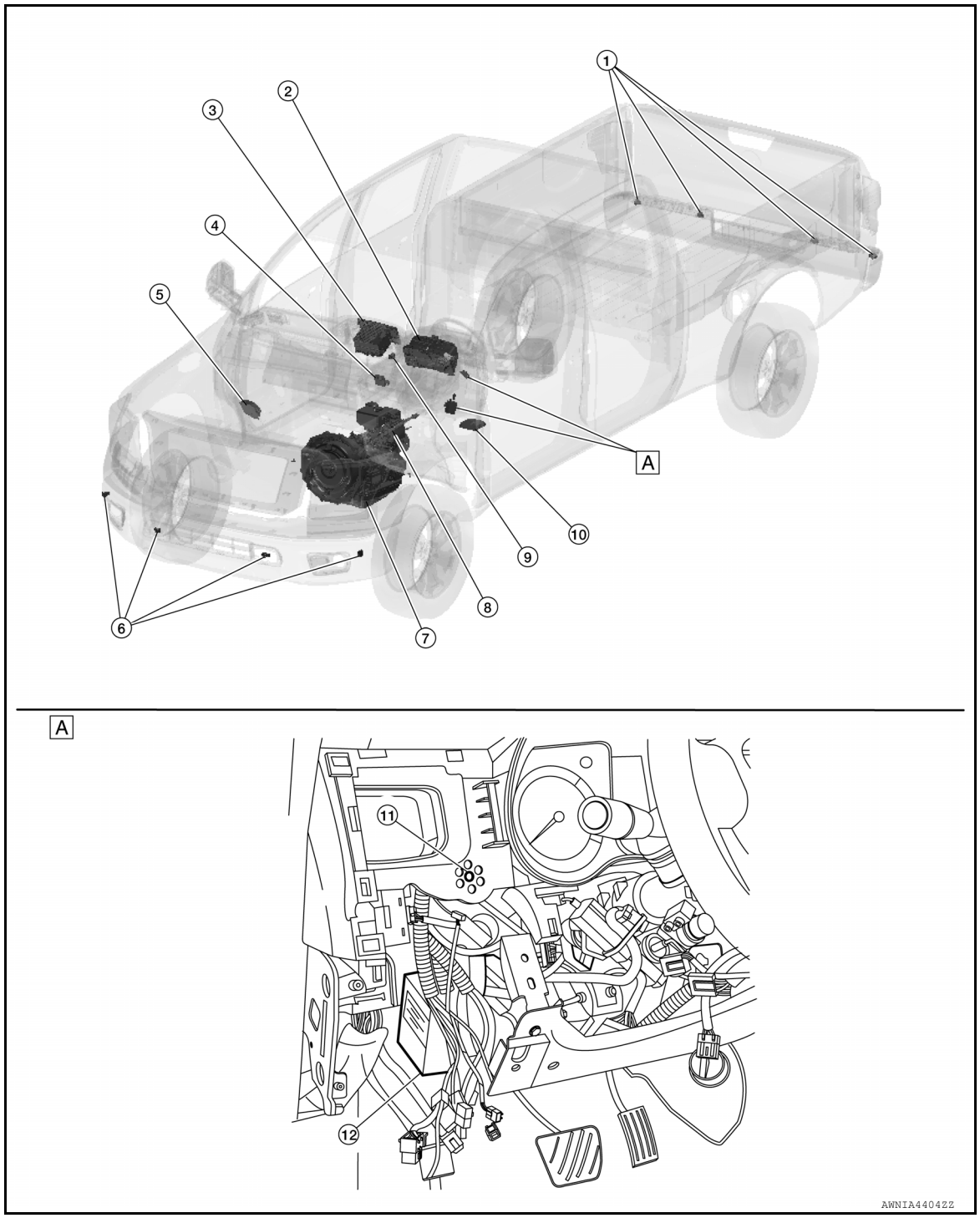


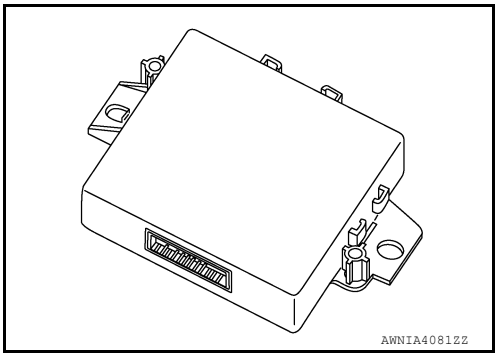
A. Instrument lower panel LH (view with instrument lower panel LH removed)

No.	Component	Function
1.	Rear sonar sensors	Refer to SN-6, "Sonar Sensor".
2.	Combination meter	Refer to MWI-12, "METER SYSTEM : Combination Meter". Displays the sonar indicator.
3.	AV control unit	Refer to AV-171, "AV Control Unit". Displays an around view monitor image with sonar indicator.
4.	ADAS control unit	Refer to DAS-5, "ADAS Control Unit". Supplies power and ground for the sonar system OFF switch, when equipped.
5.	TCM (Cummins 5.0L)	Refer to TM-17, "A/T CONTROL SYSTEM : TCM". Supplies the P (park) or D (drive) signal to the sonar control unit via CAN communication.
6.	Front sonar sensors	Refer to SN-6, "Sonar Sensor".
7.	TCM (integral to the control valve assembly, built into the A/T assembly) (VK56VD)	Refer to TM-267, "A/T CONTROL SYSTEM : TCM". Supplies the P (park) or D (drive) signal to the sonar control unit via CAN communication.
8.	ABS actuator and electric unit (control unit)	Refer to BRC-10, "ABS Actuator and Electric Unit (Control Unit)". Supplies the speed signal to the sonar control unit via CAN communication.
9.	Sonar system OFF switch	Refer to SN-7, "Sonar System Off Switch".
10.	Around view monitor control unit	Refer to AV-296, "Around View Monitor Control Unit". Renders the sonar indicator image for display on the AV control unit.
11.	Front sonar buzzer	Refer to SN-7, "Buzzer".
12.	Sonar control unit	Refer to SN-6, "Sonar Control Unit".

Sonar Control Unit

INFOID:0000000014386732

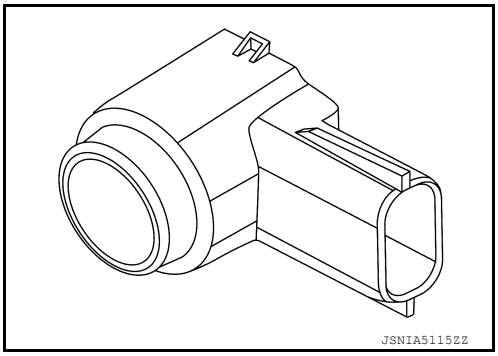
- Sonar sensor signals are received by the sonar control unit and transmitted to the around view monitor control unit or combination meter via CAN communication for the indicator display.
- Sonar control unit outputs a buzzer signal for audible alert.



Sonar Sensor

INFOID:0000000014386733

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



Buzzer

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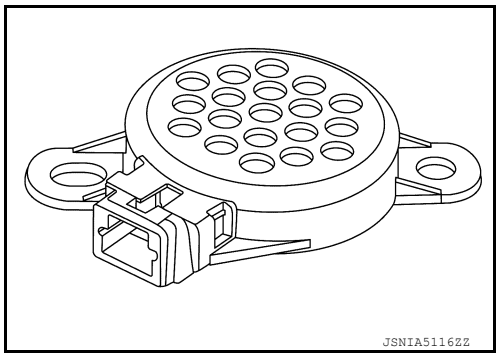
The front sonar buzzer sounds with the signal from the sonar control unit.



Sonar System Off Switch

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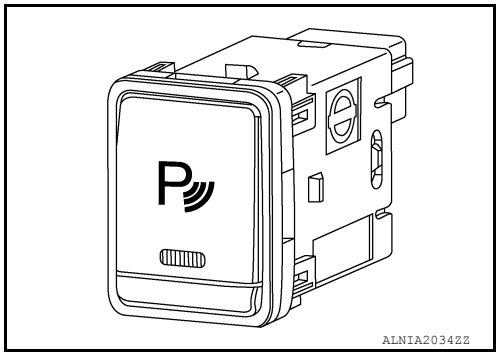
The sonar system off switch is used to turn the system ON/OFF.



SYSTEM

System Description

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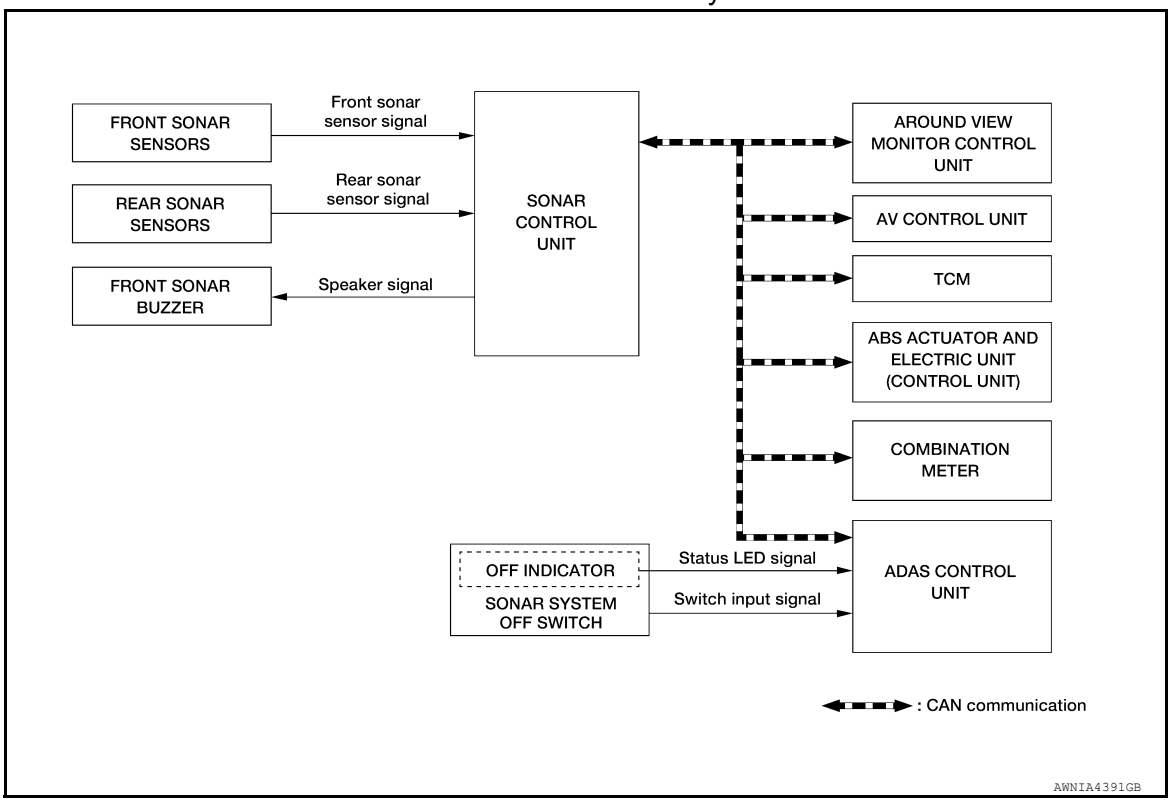
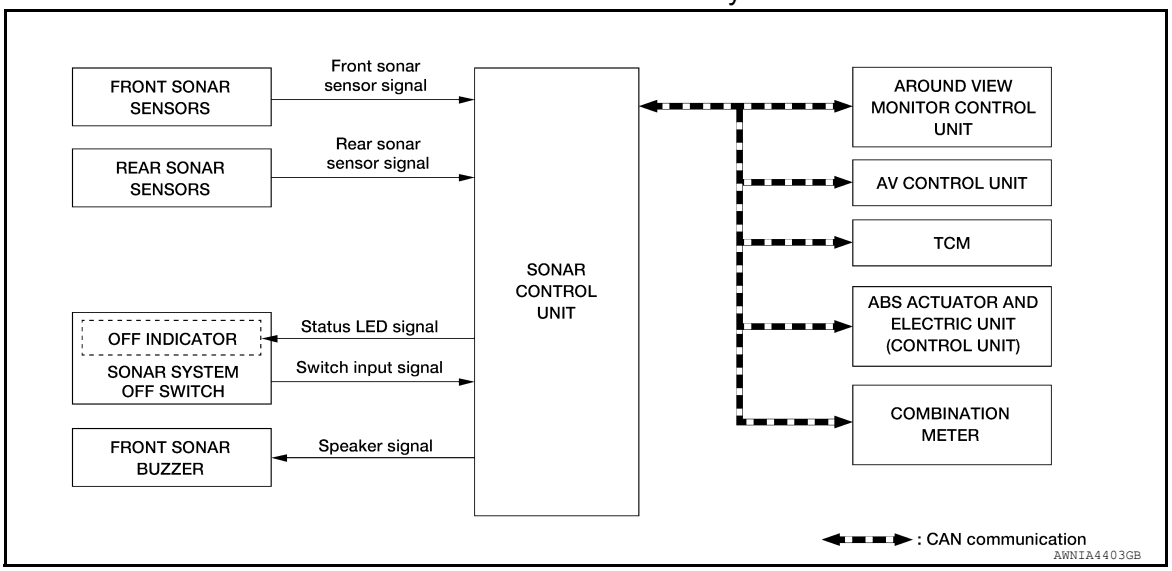
SYSTEM DIAGRAM

With Driver Assistance System



Without Driver Assistance System



DESCRIPTION

Camera Assistance Sonar Function (With Around View Monitor)

- Inner/outer sensors are installed on front bumper and rear bumper. When an obstacle is detected while around view monitor is displayed, a sonar indicator display and buzzer sound notify the driver of the proximity of an obstacle. When an obstacle is detected while around view monitor is not displayed, around view monitor screen is displayed automatically, and then the indicator displays and buzzer sounds.

- A sonar indicator is displayed in the combination meter information display also.
- The warning buzzer output frequency changes according to the detection distance.
- Sonar control unit receives shift position signals (P, R, N and D) from TCM and vehicle speed signal from ABS actuator control unit via CAN communication, and controls ON/OFF of sonar system.
- Sonar control unit transmits detection signal and detection distance signal to around view monitor and combination meter via CAN communication, according to signal from inner/outer sensors depending on conditions shown in the following table. Around view monitor and combination meter display the applicable sonar indicator.

Sonar system operation condition			Sonar operation	
Shift position	Vehicle speed	Obstacle	Sonar indicator	Buzzer
R position	Less than 10 km/h (6 MPH)	Yes	Detection status is displayed	Yes
D position	Less than 10 km/h (6 MPH)	Yes	Detection status is displayed	Yes
P or N position	Less than 10 km/h (6 MPH)	Yes	Detection status is displayed*	None
—	10 km/h (6 MPH) or more	Yes	Not displayed	None

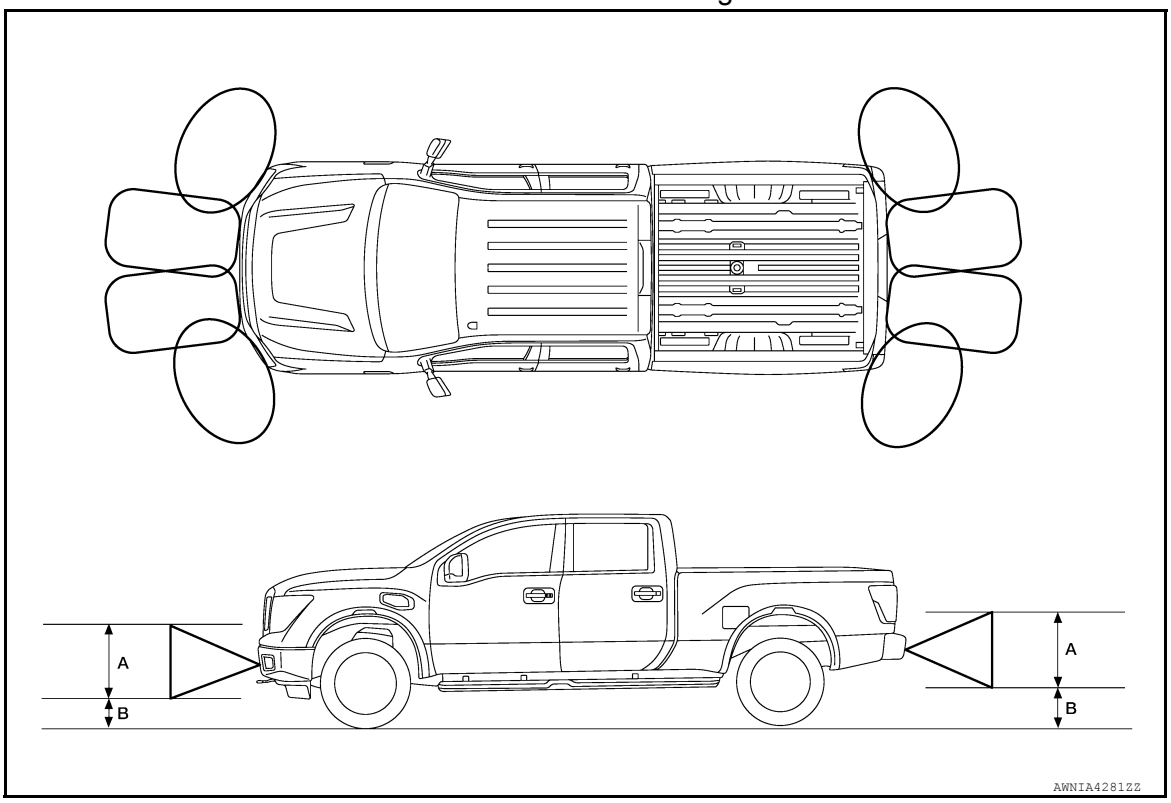
*: Only when camera image is displayed.

Sonar Function (Without Around View Monitor)

- Inner/outer sensors are installed on front bumper and rear bumper. When an obstacle is detected, a sonar indicator is displayed in the combination meter and buzzer sounds to notify the driver of the proximity of an obstacle.
- Sonar control unit transmits the sonar operation signal via CAN communication to the combination meter to control the operation of sonar indicator.
- The warning buzzer output frequency changes according to the detection distance.

Obstacle Detection Distance

Obstacle detection image



A. Approx. 50 cm (19.6 in) B. Approx. 15 cm (5.9 in)

Sonar Indicator Display

With Around View Monitor
- Around view monitor control unit receives the detection signal and detection distance signal from sonar control unit and displays the sonar indicator on AV control unit display.
- Around view monitor control unit changes the color or blinking cycle of the indicator according to the detection distance.

Without Around View Monitor
- Combination meter receives the detection signal and detection distance signal from sonar control unit and displays the sonar indicator on the information display.
- Combination meter changes the color or blinking cycle of the indicator according to the detection distance.

Sonar Buzzer Operation
- Each sonar sensor transmits a sensor signal to the sonar control unit when detecting an obstacle.
- The sonar control unit converts a signal received from each sonar sensor into distance and then sounds the buzzer accordingly.

DIAGNOSIS SYSTEM (SONAR CONTROL UNIT)

CONSULT Function

INFOID:0000000014386737

CAUTION:
After disconnecting the CONSULT VI (vehicle interface) from the data link connector, the ignition must be cycled OFF → ON (for at least 5 seconds) → OFF. If this step is not performed, the BCM may not go to "sleep mode", potentially causing a discharged battery and no-start condition.

APPLICATION ITEMS

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

Direct Diagnostic Mode	Description
Ecu Identification	The sonar control unit part number is displayed.
Self Diagnostic Result	The sonar control unit self diagnostic results are displayed.
Data Monitor	The sonar control unit input/output data is displayed in real time.
Active Test	The sonar control unit activates outputs to test components.
Work support	The settings for sonar control unit functions can be changed.
Configuration	• The vehicle specification can be read and saved. • The vehicle specification can be written when replacing sonar control unit.
CAN Diag Support Mntr	The result of transmit/receive diagnosis of CAN communication is displayed.

ECU IDENTIFICATION

Displays the part number of sonar control unit.

SELF-DIAGNOSTIC RESULTS

For details, refer to SN-18, "DTC Index".

DATA MONITOR

Monitor Item	Description
VEHICLE SPEED [mph/km/h]	Indicates vehicle speed signal received from combination meter on CAN communication line.
SONAR C/U POWER SUPPLY [V]	Indicates condition of supply voltage signal to sonar control unit.
SENSOR VOLTAGE [V]	Indicates condition of voltage signal to sonar sensors.
DETECTION MODE [Mode 1/Mode 2]	Indicates condition of display detection mode.
SONAR TEMPORARY OFF [Yes/No]	Indicates condition of sonar system.
SONAR PERMANENT OFF [Yes/No]	Indicates condition of sonar system.
P N RANGE [On/Off]	Indicates condition of A/T shift selector P (park) or N (neutral) position.
LED [Yes/No]	Indicates condition of LED indicator.
TRAILER CONNECT [CON/N CON]	Indicates if trailer is connected.
REVERSE RANGE [On/Off]	Indicates condition of transmission range switch R (reverse) position.

Monitor Item	Description
SHRT DST FRM RR SENS [cm/in]	Indicates distance to obstacle.
SHRT DST FRM FR SENS [cm/in]	
COR[RL] [cm/in]	
COR[RL]->CEN[RL]/CEN[R] [cm/in]	
CEN[RL]/CEN[R]->COR[RL] [cm/in]	
CEN[RL]/CEN[R] [cm/in]	
CEN[RL]->CEN[RR] [cm/in]	
CEN[RR]->CEN[RL] [cm/in]	
CEN[RR] [cm/in]	
CEN[RR]/CEN[R]->COR[RR] [cm/in]	
COR[RR]->CEN[RR]/CEN[R] [cm/in]	
COR[RR] [cm/in]	
COR[FL] [cm/in]	
COR[FL]->CEN[FL]/CEN[F] [cm/in]	
CEN[FL]/CEN[F]->COR[FL] [cm/in]	
CEN[FL]/CEN[F] [cm/in]	
CEN[FL]->CEN[FR] [cm/in]	
CEN[FR]->CEN[FL] [cm/in]	
CEN[FR] [cm/in]	
CEN[FR]/CEN[F]->COR[FR] [cm/in]	
COR[FR]->CEN[FR]/CEN[F] [cm/in]	
COR[FR] [cm/in]	
RVRB TIME COR[RL] [ms/sec]	
RVRB TIME COR[RR] [ms/sec]	
RVRB TIME CEN[RL] [ms/sec]	
RVRB TIME CEN[RR] [ms/sec]	
RVRB TIME COR[FL] [ms/sec]	
RVRB TIME COR[FR] [ms/sec]	
RVRB TIME CEN[FL] [ms/sec]	
RVRB TIME CEN[FR] [ms/sec]	

ACTIVE TEST

Test Item	Description
FRONT BUZZER	This test is able to check front buzzer operation [On/Off].
LED	This test is able to check off indicator operation [On/Off].

WORK SUPPORT

Support Item	Setting	Description
VOLUME SETTING	Vol.1	Allows you to set volume of warning tone.
	Low	
	Vol.3	
	Middle	
	Vol.5	
	High	
	Off	
TRAILER HITCH DETECTION RANGE ADJUSTMENT	Qu	Allows you to adjust rear sonar sensors for trailer towing.
	UP	
	DOWN	
	Qd	

CONFIGURATION

Refer to SN-32, "CONFIGURATION (SONAR CONTROL UNIT) : Description".

CAN DIAG SUPPORT MNTR

Refer to LAN-50, "CAN Diagnostic Support Monitor".

ECU DIAGNOSIS INFORMATION

SONAR CONTROL UNIT

Reference Value

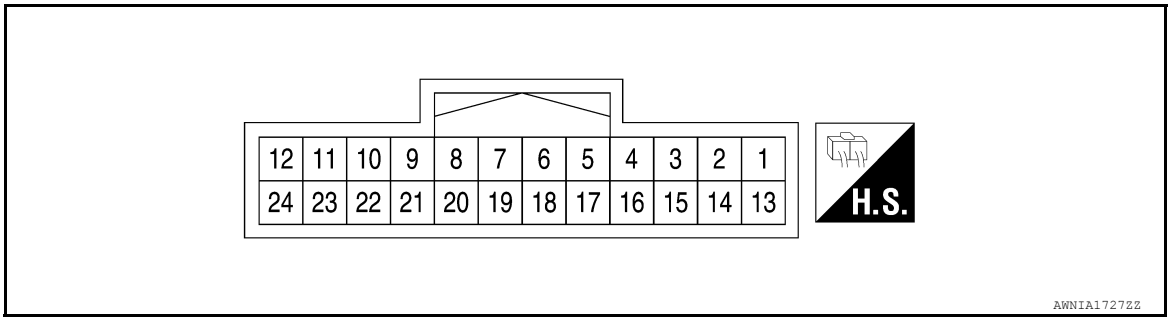
INFOID:0000000014386738

VALUES ON THE DIAGNOSIS TOOL

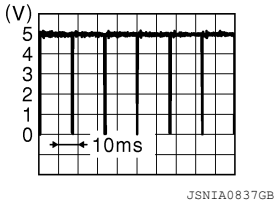
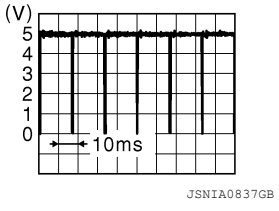
Monitor Item	Condition	Value/Status
COR[FL]	Key ON, A/T shift selector in R (reverse) position.	cm/in
COR[FR]		
COR[RL]		
COR[RR]		
COR[RL]->CEN[RL]/CEN[R] [cm/in]		
CEN[RL]/CEN[R]->COR[RL] [cm/in]		
CEN[RL]/CEN[R] [cm/in]		
CEN[RL]->CEN[RR] [cm/in]		
CEN[RR]->CEN[RL] [cm/in]		
CEN[RR] [cm/in]		
CEN[RR]/CEN[R]->COR[RR] [cm/in]		
COR[RR]->CEN[RR]/CEN[R] [cm/in]		
COR[FL]->CEN[FL]/CEN[F] [cm/in]		
CEN[FL]/CEN[F]->COR[FL] [cm/in]		
CEN[FL]/CEN[F] [cm/in]		
CEN[FL]->CEN[FR] [cm/in]		
CEN[FR]->CEN[FL] [cm/in]		
CEN[FR] [cm/in]		
CEN[FR]/CEN[F]->COR[FR] [cm/in]		
COR[FR]->CEN[FR]/CEN[F] [cm/in]		
DETECTION MODE	Key ON.	Mode 1
		Mode 2
P N RANGE	When A/T shift selector is in any position other than P (park) or N (neutral).	Off
	When A/T shift selector in P (park) or N (neutral) position.	On
LED	When LED is off.	No
	When LED is on.	Yes
TRAILER CONNECT	When no trailer is connected.	N CONN
	When trailer is connected.	CONN
REVERSE RANGE	When transmission range switch is in any position other than R (reverse).	Off
	When transmission range switch is in R (reverse) position.	On

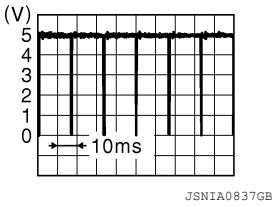
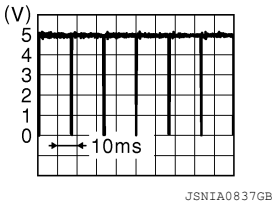
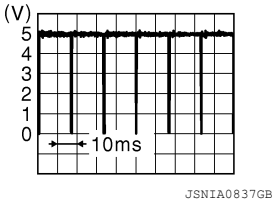
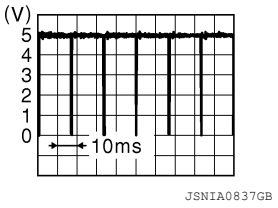
Monitor Item	Condition	Value/Status
RVRB TIME CEN[FL]	Key ON, A/T shift selector in R (reverse) position.	ms/sec
RVRB TIME CEN[FR]		
RVRB TIME CEN[RL]		
RVRB TIME CEN[RR]		
RVRB TIME COR[FL]		
RVRB TIME COR[FR]		
RVRB TIME COR[RL]		
RVRB TIME COR[RR]		
SENSOR VOLTAGE		5.0 V
SHRT DST FRM FR SENS		cm/in
SHRT DST FRM RR SENS		
SONAR C/U POWER SUPPLY	Key ON.	Battery voltage
SONAR PERMANENT OFF	Key ON, A/T shift selector in R (reverse) position.	No
	When selector lever is in any position other than R (reverse).	Yes
SONAR TEMPORARY OFF	Key ON, A/T shift selector in R (reverse) position.	No
	When A/T shift selector is in any position other than R (reverse).	Yes
VEHICLE SPEED	While driving, equivalent to speedometer reading	mph, km/h

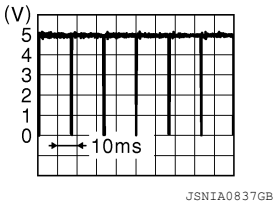
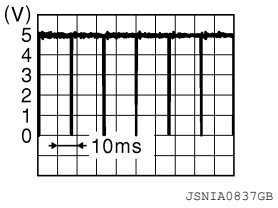
TERMINAL LAYOUT



PHYSICAL VALUES

Terminal (Wire color)		Description		Condition		Reference value (Approx.)
+	–	Signal name	Input/ Output	Ignition switch	Operation	
1 (W/L)	13 (W)	Front inner right sensor signal	Input	ON	Shift position is D (drive) or R (reverse). Obstacle within range of front sonar sensor RH inner.	
2 (W/R)	13 (W)	Front inner left sensor signal	Input	ON	Shift position is D (drive) or R (reverse). Obstacle within range of front sonar sensor LH inner.	

Terminal (Wire color)		Description		Condition		Reference value (Approx.)
+	–	Signal name	Input/ Output	Ignition switch	Operation	
3 (O)	13 (W)	Front outer left sensor signal	Input	ON	Shift position is D (drive) or R (reverse). Obstacle within range of front sonar sensor LH outer.	 JSNIA0837GB
4 (BG)	13 (W)	Front outer right sensor signal	Input	ON	Shift position is D (drive) or R (reverse). Obstacle within range of front sonar sensor RH outer.	 JSNIA0837GB
5 (L)	—	CAN high	Input/ Output	—	—	—
6 (R)	—	CAN low	Input/ Output	—	—	—
9 (L)	14 (BG)	Rear inner right sensor signal	Input	ON	Shift position is D (drive) or R (reverse). Obstacle within range of rear sonar sensor RH inner.	 JSNIA0837GB
10 (O)	14 (BG)	Rear outer right sensor signal	Input	ON	Shift position is D (drive) or R (reverse). Obstacle within range of rear sonar sensor RH outer.	 JSNIA0837GB
12 (G/R)	Ground	Ignition power supply	Input	ON	—	Battery voltage
15 (B)	Ground	Ground	—	ON	—	0 V
16[1] (G)	Ground	Switch input signal	Input	ON	Sonar system off switch pressed.	0 V
					Sonar system off switch released.	Battery voltage
17[1] (G/B)	Ground	Status LED	Output	ON	Sonar system off switch ON.	Battery voltage
18 (G)	Ground	Speaker signal	Output	ON	Shift position is D (drive) or R (reverse). Obstacle within range of any sonar sensor.	Battery voltage
19 (W)	Ground	Speaker power supply	Output	ON	—	Battery voltage

Terminal (Wire color)		Description		Condition		Reference value (Approx.)
+	–	Signal name	Input/ Output	Ignition switch	Operation	
21 (Y)	14 (BG)	Rear inner left sensor signal	Input	ON	Shift position is D (drive) or R (reverse). Obstacle within range of rear sonar sensor LH inner.	
22 (B)	14 (BG)	Rear outer left sensor signal	Input	ON	Shift position is D (drive) or R (reverse). Obstacle within range of rear sonar sensor LH outer.	
24 (G/W)	Ground	Reverse position input signal	Input	ON	Shift position is R (reverse).	Battery voltage

[1]: Without driver assistance system

Fail Safe

INFOID:0000000014386739

Display contents of CONSULT	Fault	Fail-safe operation
U1000: CAN COMM CIRCUIT	• Loss of communication with ABS actuator and electric unit (control unit) • Loss of communication with TCU	• Front sonar system is OFF, rear sonar system is ON (selector lever in reverse) • Front and rear sonar system are OFF
B2720: Rear left side external sensor	• Open circuit/short circuit to ground • Short circuit to voltage • Sensor element malfunction	• Obstacle detection of the sensor in error is stopped • Audible warning (front sonar buzzer) of all sensors is stopped • Front sonar buzzer sounds for 3 seconds
B2721: Rear left side internal sensor		
B2722: Rear right side internal sensor		
B2723: Rear right side external sensor		
B2724: ECU	Configuration check	• Off indicator blinks periodically (500ms ON, 500ms OFF) • Front sonar buzzer sounds for 3 seconds
B2728: Led	• Short circuit to ground • Short circuit to voltage • Open circuit	• Audible warning (front sonar buzzer) of all sensors is stopped • Front sonar buzzer sounds for 3 seconds
B2729: Front left side external sensor	• Open circuit/short circuit to ground • Short circuit to voltage • Sensor element malfunction	• Obstacle detection of the sensor in error is stopped • Audible warning (front sonar buzzer) of all sensors is stopped • Front sonar buzzer sounds for 3 seconds
B272A: Front left side internal sensor		
B272B: Front right side internal sensor		
B272C: Front right side external sensor		
B272D: Front buzzer	• Open circuit/short circuit to ground • Short circuit to voltage	• Off indicator blinks periodically (500ms ON, 500ms OFF) • Audible warning (front sonar buzzer) of all sensors is stopped

DTC Index

INFOID:0000000014386740

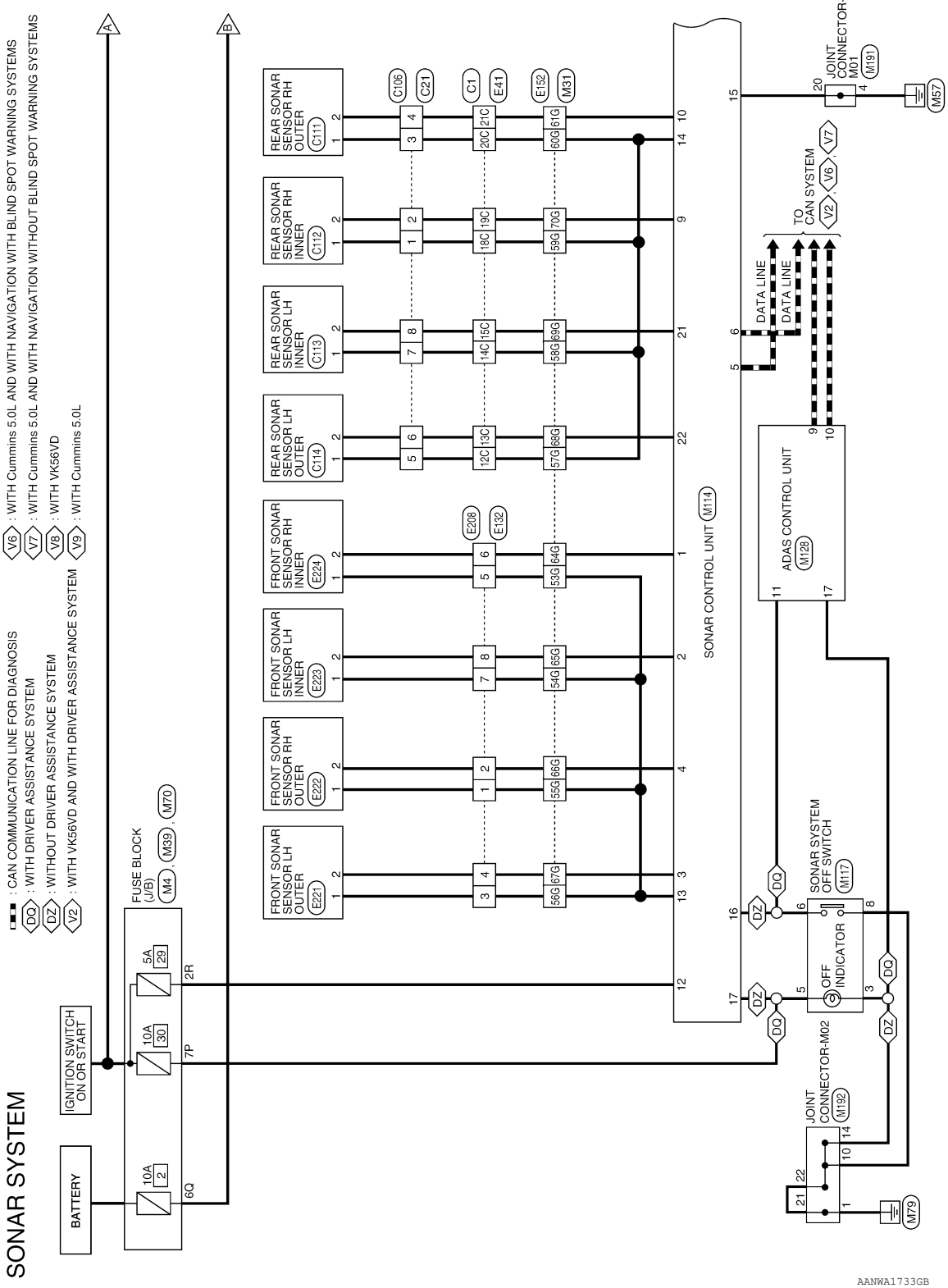
CONSULT Display	Reference Page
U1000: CAN COMM CIRCUIT	SN-34, "DTC Description"
U1010: CONTROL UNIT(CAN)	SN-35, "DTC Description"
B2720: Rear left side external sensor	SN-36, "DTC Description"
B2721: Rear left side internal sensor	SN-38, "DTC Description"
B2722: Rear right side internal sensor	SN-40, "DTC Description"
B2723: Rear right side external sensor	SN-42, "DTC Description"
B2724: ECU	SN-44, "DTC Description"
B2728: Led	SN-45, "DTC Description"
B2729: Front left side external sensor	SN-47, "DTC Description"
B272A: Front left side internal sensor	SN-49, "DTC Description"
B272B: Front right side internal sensor	SN-51, "DTC Description"
B272C: Front right side external sensor	SN-53, "DTC Description"
B272D: Front Buzzer	SN-55, "DTC Description"

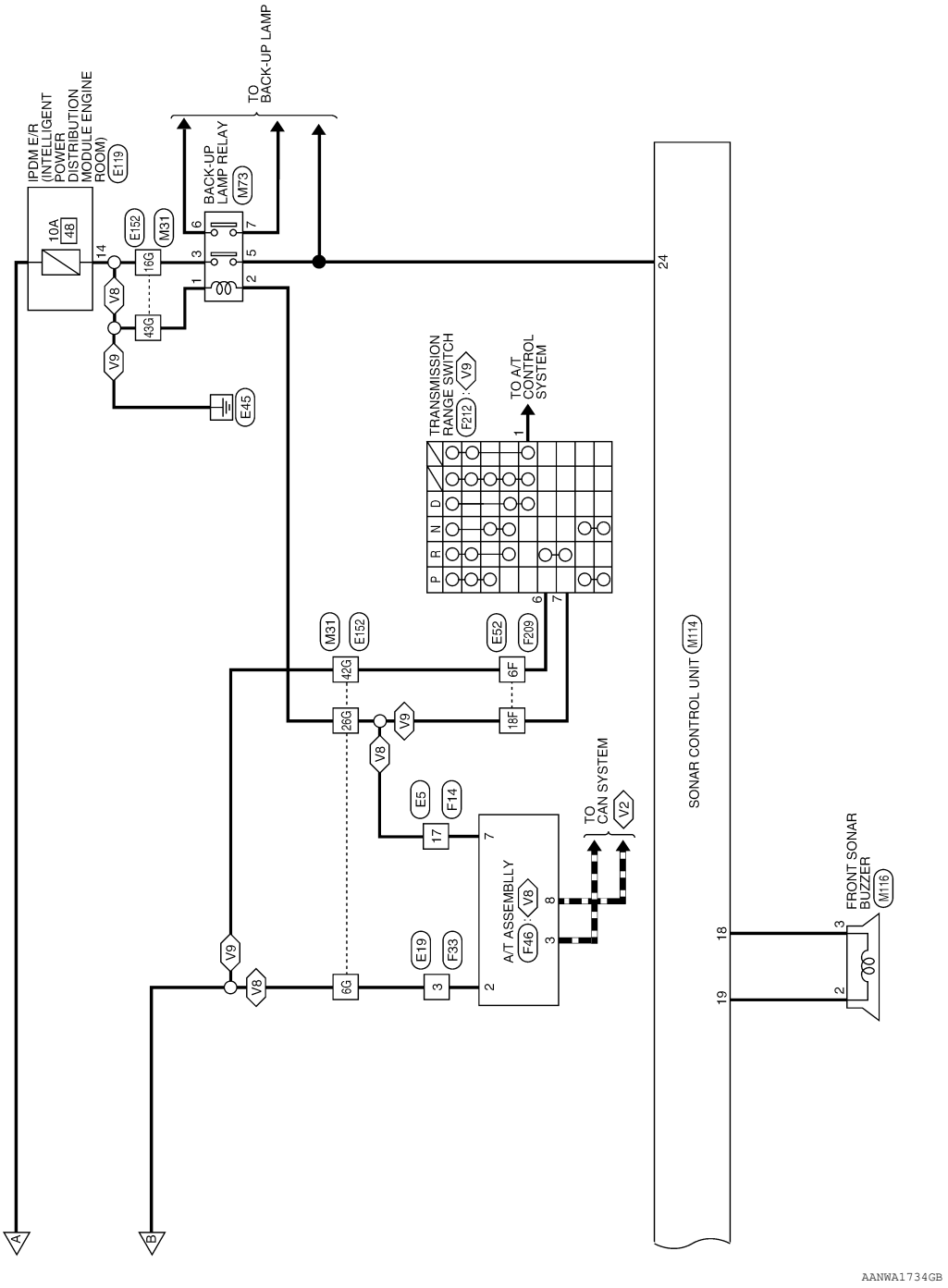
WIRING DIAGRAM

SONAR SYSTEM

Wiring Diagram

INFOID:0000000014386741




IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) E119
10A 48
BACK-UP LAMP RELAY M73
TO BACK-UP LAMP
E152
M31
16G
43G
V8
V9
E45
TRANSMISSION RANGE SWITCH F212
TO A/T CONTROL SYSTEM
P R N D
M31
E152
42G
E52
F209
6F
26G
18F
V9
V8
E5
F14
17
TO CAN SYSTEM V2
A/T ASSEMBLY F46
E19
F33
6G
3
SONAR CONTROL UNIT M114
FRONT SONAR BUZZER M116
A
B
AANWA1734GB

SONAR SYSTEM CONNECTORS

Connector No.	C1
Connector Name	WIRE TO WIRE
Connector Type	RK26FGY-RS20-X6
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1C	Y/V	TO ENGINE ROOM HARNESS
2C	W/L	TO ENGINE ROOM HARNESS
3C	B	TO ENGINE ROOM HARNESS
4C	BR/W	TO ENGINE ROOM HARNESS
5C	BR/Y	TO ENGINE ROOM HARNESS
6C	Y	TO ENGINE ROOM HARNESS
7C	G/R	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
7C	R	TO ENGINE ROOM HARNESS - (WITH VK56VD)
8C	B	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
8C	O/B	TO ENGINE ROOM HARNESS - (WITH VK56VD)
9C	W/L	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
9C	SB	TO ENGINE ROOM HARNESS - (WITH VK56VD)
10C	GR/R	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
10C	GR	TO ENGINE ROOM HARNESS - (WITH VK56VD)
11C	B	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
11C	R/W	TO ENGINE ROOM HARNESS - (WITH VK56VD)
12C	Y	TO ENGINE ROOM HARNESS
13C	B	TO ENGINE ROOM HARNESS
14C	BG	TO ENGINE ROOM HARNESS
15C	Y	TO ENGINE ROOM HARNESS
16C	B	TO ENGINE ROOM HARNESS
17C	V	TO ENGINE ROOM HARNESS
18C	BG	TO ENGINE ROOM HARNESS
19C	L	TO ENGINE ROOM HARNESS
20C	W	TO ENGINE ROOM HARNESS
21C	LG	TO ENGINE ROOM HARNESS
22C	SHIELD	TO ENGINE ROOM HARNESS
23C	G/B	TO ENGINE ROOM HARNESS
24C	G/B	TO ENGINE ROOM HARNESS
25C	W	TO ENGINE ROOM HARNESS
26C	B	TO ENGINE ROOM HARNESS
27C	LG	TO ENGINE ROOM HARNESS
28C	G/W	TO ENGINE ROOM HARNESS
29C	R/LG	TO ENGINE ROOM HARNESS
30C	R/L	TO ENGINE ROOM HARNESS
31C	B	TO ENGINE ROOM HARNESS
32C	R	TO ENGINE ROOM HARNESS
33C	L/W	TO ENGINE ROOM HARNESS
34C	L	TO ENGINE ROOM HARNESS
35C	R/W	TO ENGINE ROOM HARNESS
36C	L	TO ENGINE ROOM HARNESS
37C	Y	TO ENGINE ROOM HARNESS
38C	GR	TO ENGINE ROOM HARNESS
39C	R	TO ENGINE ROOM HARNESS
40C	P	TO ENGINE ROOM HARNESS
41C	V	TO ENGINE ROOM HARNESS
42C	LG/B	TO ENGINE ROOM HARNESS
43C	Y/B	TO ENGINE ROOM HARNESS
44C	R	TO ENGINE ROOM HARNESS
45C	G	TO ENGINE ROOM HARNESS
46C	BR	TO ENGINE ROOM HARNESS
47C	B	TO ENGINE ROOM HARNESS
48C	Y/R	TO ENGINE ROOM HARNESS
49C	R/Y	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
49C	V	TO ENGINE ROOM HARNESS - (WITH VK56VD)
50C	B	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
50C	B/Y	TO ENGINE ROOM HARNESS - (WITH VK56VD)
51C	V	TO ENGINE ROOM HARNESS - (WITH CUMMINS 5.0L)
51C	B	TO ENGINE ROOM HARNESS - (WITH VK56VD)
52C	V/W	TO ENGINE ROOM HARNESS

Connector No.	C21
Connector Name	WIRE TO WIRE
Connector Type	RS08FGY-PR
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	BG	TO CHASSIS HARNESS
2	L	TO CHASSIS HARNESS
3	BG	TO CHASSIS HARNESS
4	B	TO CHASSIS HARNESS
5	Y	TO CHASSIS HARNESS
6	B	TO CHASSIS HARNESS
7	BG	TO CHASSIS HARNESS
8	Y	TO CHASSIS HARNESS

Connector No.	C111
Connector Name	REAR SONAR SENSOR RH OUTER
Connector Type	RH03FB
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	BG	GROUND
2	B	SIGNAL
3	-	-

Connector No.	C112
Connector Name	REAR SONAR SENSOR RH INNER
Connector Type	RH03FB
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	BG	GROUND
2	L	SIGNAL
3	-	-

Connector No.	C106
Connector Name	WIRE TO WIRE
Connector Type	RS08MGY-PR
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	BG	TO REAR SONAR SENSOR SUB HARNESS
2	L	TO REAR SONAR SENSOR SUB HARNESS
3	W	TO REAR SONAR SENSOR SUB HARNESS
4	LG	TO REAR SONAR SENSOR SUB HARNESS
5	Y	TO REAR SONAR SENSOR SUB HARNESS
6	B	TO REAR SONAR SENSOR SUB HARNESS
7	BG	TO REAR SONAR SENSOR SUB HARNESS
8	Y	TO REAR SONAR SENSOR SUB HARNESS

Connector No.	C113
Connector Name	REAR SONAR SENSOR LH INNER
Connector Type	RH03FB
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	BG	GROUND
2	Y	SIGNAL
3	-	-

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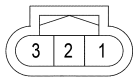
SONAR SYSTEM CONNECTORS

Connector No.	C114
Connector Name	REAR SONAR SENSOR LH OUTER
Connector Type	RH03FB
Connector Color	BLACK

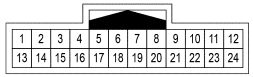
H.S.



Terminal No.	Color of Wire	Signal Name
1	Y	GROUND
2	B	SIGNAL
3	–	–

Connector No.	E5
Connector Name	WIRE TO WIRE
Connector Type	TH24MW-NH
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
1	L/R	TO ENGINE CONTROL HARNESS
2	BR	TO ENGINE CONTROL HARNESS
3	V	TO ENGINE CONTROL HARNESS
4	L/O	TO ENGINE CONTROL HARNESS
5	W	TO ENGINE CONTROL HARNESS
6	B/R	TO ENGINE CONTROL HARNESS
7	Y/R	TO ENGINE CONTROL HARNESS
8	BR	TO ENGINE CONTROL HARNESS
9	W/L	TO ENGINE CONTROL HARNESS
10	L/Y	TO ENGINE CONTROL HARNESS
11	SB	TO ENGINE CONTROL HARNESS
12	L	TO ENGINE CONTROL HARNESS
13	W/R	TO ENGINE CONTROL HARNESS
14	Y	TO ENGINE CONTROL HARNESS
15	B	TO ENGINE CONTROL HARNESS
16	B	TO ENGINE CONTROL HARNESS
17	R	TO ENGINE CONTROL HARNESS
18	B	TO ENGINE CONTROL HARNESS
19	B/R	TO ENGINE CONTROL HARNESS
20	GR	TO ENGINE CONTROL HARNESS
21	V/R	TO ENGINE CONTROL HARNESS
22	B	TO ENGINE CONTROL HARNESS
23	B	TO ENGINE CONTROL HARNESS
24	P	TO ENGINE CONTROL HARNESS

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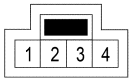
Connector No.	E19
Connector Name	WIRE TO WIRE
Connector Type	NS04MW-CS
Connector Color	WHITE

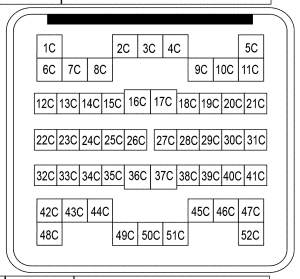
H.S.



Terminal No.	Color of Wire	Signal Name
1	L	TO ENGINE CONTROL HARNESS
2	W	TO ENGINE CONTROL HARNESS
3	P	TO ENGINE CONTROL HARNESS
4	SB	TO ENGINE CONTROL HARNESS

Connector No.	E41
Connector Name	WIRE TO WIRE
Connector Type	RK26MGY-RS20-X6
Connector Color	GRAY

H.S.



Terminal No.	Color of Wire	Signal Name
1C	Y/V	TO CHASSIS HARNESS
2C	W/L	TO CHASSIS HARNESS
3C	B	TO CHASSIS HARNESS
4C	BR/W	TO CHASSIS HARNESS
5C	BR/Y	TO CHASSIS HARNESS
6C	Y	TO CHASSIS HARNESS
7C	G/R	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
7C	R	TO CHASSIS HARNESS - (WITH VK56VD)
8C	B	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
8C	O/B	TO CHASSIS HARNESS - (WITH VK56VD)
9C	W/L	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
9C	SB	TO CHASSIS HARNESS - (WITH VK56VD)
10C	GR/R	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
10C	GR	TO CHASSIS HARNESS - (WITH VK56VD)
11C	B	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
11C	R/W	TO CHASSIS HARNESS - (WITH VK56VD)
12C	Y	TO CHASSIS HARNESS
13C	B	TO CHASSIS HARNESS
14C	BG	TO CHASSIS HARNESS
15C	Y	TO CHASSIS HARNESS
16C	B	TO CHASSIS HARNESS
17C	V	TO CHASSIS HARNESS
18C	BG	TO CHASSIS HARNESS
19C	L	TO CHASSIS HARNESS
20C	BG	TO CHASSIS HARNESS
21C	B	TO CHASSIS HARNESS
22C	SHIELD	TO CHASSIS HARNESS
23C	G/B	TO CHASSIS HARNESS
24C	G/Y	TO CHASSIS HARNESS
25C	W	TO CHASSIS HARNESS
26C	B	TO CHASSIS HARNESS
27C	LG	TO CHASSIS HARNESS
28C	G/W	TO CHASSIS HARNESS
29C	R/G	TO CHASSIS HARNESS - (WITHOUT BULB CHECK)
29C	G/R	TO CHASSIS HARNESS - (WITH BULB CHECK)
30C	R/L	TO CHASSIS HARNESS
31C	B	TO CHASSIS HARNESS
32C	R	TO CHASSIS HARNESS
33C	L/W	TO CHASSIS HARNESS
34C	L	TO CHASSIS HARNESS
35C	R/W	TO CHASSIS HARNESS
36C	L	TO CHASSIS HARNESS
37C	Y	TO CHASSIS HARNESS
38C	BR	TO CHASSIS HARNESS
39C	R	TO CHASSIS HARNESS
40C	P	TO CHASSIS HARNESS
41C	V	TO CHASSIS HARNESS
42C	G/B	TO CHASSIS HARNESS
43C	Y/B	TO CHASSIS HARNESS
44C	R	TO CHASSIS HARNESS
45C	G	TO CHASSIS HARNESS
46C	BR	TO CHASSIS HARNESS
47C	B	TO CHASSIS HARNESS
48C	Y/R	TO CHASSIS HARNESS
49C	R/Y	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
49C	V	TO CHASSIS HARNESS - (WITH VK56VD)
50C	B	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
50C	B/Y	TO CHASSIS HARNESS - (WITH VK56VD)
51C	V	TO CHASSIS HARNESS - (WITH CUMMINS 5.0L)
51C	B	TO CHASSIS HARNESS - (WITH VK56VD)
52C	B	TO CHASSIS HARNESS - (WITHOUT FFV)
52C	L	TO CHASSIS HARNESS - (WITH FFV)
52C	V/W	TO CHASSIS HARNESS

SONAR SYSTEM CONNECTORS

Connector No.	E52
Connector Name	WIRE TO WIRE
Connector Type	RK26FGY-RS20-X6
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1F	Y	TO ENGINE CONTROL NO. 2 HARNESS
2F	B	TO ENGINE CONTROL NO. 2 HARNESS
3F	BR	TO ENGINE CONTROL NO. 2 HARNESS
4F	W/R	TO ENGINE CONTROL NO. 2 HARNESS
5F	B/R	TO ENGINE CONTROL NO. 2 HARNESS
6F	O	TO ENGINE CONTROL NO. 2 HARNESS
7F	GR/Y	TO ENGINE CONTROL NO. 2 HARNESS
8F	V	TO ENGINE CONTROL NO. 2 HARNESS
9F	BR	TO ENGINE CONTROL NO. 2 HARNESS
10F	Y/B	TO ENGINE CONTROL NO. 2 HARNESS
11F	L	TO ENGINE CONTROL NO. 2 HARNESS
12F	R	TO ENGINE CONTROL NO. 2 HARNESS
13F	Y	TO ENGINE CONTROL NO. 2 HARNESS
14F	V	TO ENGINE CONTROL NO. 2 HARNESS
15F	SB	TO ENGINE CONTROL NO. 2 HARNESS
16F	P	TO ENGINE CONTROL NO. 2 HARNESS
17F	Y/R	TO ENGINE CONTROL NO. 2 HARNESS
18F	R	TO ENGINE CONTROL NO. 2 HARNESS
19F	V	TO ENGINE CONTROL NO. 2 HARNESS
20F	BR	TO ENGINE CONTROL NO. 2 HARNESS
21F	L/R	TO ENGINE CONTROL NO. 2 HARNESS
22F	L/W	TO ENGINE CONTROL NO. 2 HARNESS
23F	R/L	TO ENGINE CONTROL NO. 2 HARNESS
24F	W/L	TO ENGINE CONTROL NO. 2 HARNESS
25F	W/R	TO ENGINE CONTROL NO. 2 HARNESS
26F	B/R	TO ENGINE CONTROL NO. 2 HARNESS
27F	Y	TO ENGINE CONTROL NO. 2 HARNESS
28F	W/R	TO ENGINE CONTROL NO. 2 HARNESS
29F	L/O	TO ENGINE CONTROL NO. 2 HARNESS
30F	B	TO ENGINE CONTROL NO. 2 HARNESS
31F	B	TO ENGINE CONTROL NO. 2 HARNESS
32F	V/W	TO ENGINE CONTROL NO. 2 HARNESS
33F	GR	TO ENGINE CONTROL NO. 2 HARNESS
34F	L/R	TO ENGINE CONTROL NO. 2 HARNESS
35F	R/W	TO ENGINE CONTROL NO. 2 HARNESS
36F	L/B	TO ENGINE CONTROL NO. 2 HARNESS
37F	L	TO ENGINE CONTROL NO. 2 HARNESS
38F	R/Y	TO ENGINE CONTROL NO. 2 HARNESS
39F	R/Y	TO ENGINE CONTROL NO. 2 HARNESS
40F	B/R	TO ENGINE CONTROL NO. 2 HARNESS
41F	W	TO ENGINE CONTROL NO. 2 HARNESS
42F	Y	TO ENGINE CONTROL NO. 2 HARNESS
43F	B/P	TO ENGINE CONTROL NO. 2 HARNESS
44F	Y/B	TO ENGINE CONTROL NO. 2 HARNESS
45F	L/Y	TO ENGINE CONTROL NO. 2 HARNESS
46F	O	TO ENGINE CONTROL NO. 2 HARNESS
47F	W/R	TO ENGINE CONTROL NO. 2 HARNESS
48F	L	TO ENGINE CONTROL NO. 2 HARNESS
49F	BR	TO ENGINE CONTROL NO. 2 HARNESS
50F	SHIELD	TO ENGINE CONTROL NO. 2 HARNESS
51F	L	TO ENGINE CONTROL NO. 2 HARNESS
52F	BR	TO ENGINE CONTROL NO. 2 HARNESS

Connector No.	E119
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS16FW-CS
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
3	–	–
4	B/R	NP SW
5	L/W	H/LAMP HI RH
6	G	H/LAMP HI LH
7	L	H/LAMP LO LH
8	R/Y	H/LAMP LO RH
9	G/W	FR FOG/L LH
10	–	–
11	P	ETC VB - (WITH CUMMINS 5.0L)
11	O	ETC VB - (WITH VK56VD)
12	W/R	FR FOG/L RH
13	Y/R	A/T ECU IGN
14	G	REVERSE LAMP IGN
15	GR	ABS ECU IGN
16	G	ETC RLY CONT - (WITH CUMMINS 5.0L)
16	V/R	ETC RLY CONT - (WITH VK56VD)
17	L/W	IGN COIL - (WITH CUMMINS 5.0L)
17	W	IGN COIL - (WITH VK56VD)
18	–	–

Connector No.	E132
Connector Name	WIRE TO WIRE
Connector Type	RH08FB
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	G	TO FRONT SONAR SENSOR SUB HARNESS
2	BG	TO FRONT SONAR SENSOR SUB HARNESS
3	W	TO FRONT SONAR SENSOR SUB HARNESS
4	BG	TO FRONT SONAR SENSOR SUB HARNESS
5	W	TO FRONT SONAR SENSOR SUB HARNESS
6	W/L	TO FRONT SONAR SENSOR SUB HARNESS
7	W	TO FRONT SONAR SENSOR SUB HARNESS
8	W/R	TO FRONT SONAR SENSOR SUB HARNESS

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SONAR SYSTEM CONNECTORS

Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1G	G	TO MAIN HARNESS
2G	B/R	TO MAIN HARNESS
3G	W/B	TO MAIN HARNESS
4G	BR/W	TO MAIN HARNESS
5G	P	TO MAIN HARNESS - (WITH VK56VD)
6G	R/W	TO MAIN HARNESS - (WITH CUMMINS 5.0L)
7G	Y	TO MAIN HARNESS
8G	G	TO MAIN HARNESS
9G	R	TO MAIN HARNESS
10G	W	TO MAIN HARNESS
11G	R/G	TO MAIN HARNESS
12G	W/B	TO MAIN HARNESS
13G	BR	TO MAIN HARNESS
14G	Y/B	TO MAIN HARNESS
15G	G/W	TO MAIN HARNESS
16G	G	TO MAIN HARNESS
17G	G/Y	TO MAIN HARNESS
18G	G/Y	TO MAIN HARNESS
19G	Y/V	TO MAIN HARNESS
20G	G/Y	TO MAIN HARNESS
21G	B/Y	TO MAIN HARNESS
22G	G/R	TO MAIN HARNESS
23G	Y/R	TO MAIN HARNESS

Terminal No.	Color of Wire	Signal Name
24G	G/B	TO MAIN HARNESS
25G	R/W	TO MAIN HARNESS
26G	R	TO MAIN HARNESS
27G	LG	TO MAIN HARNESS
28G	G/B	TO MAIN HARNESS
29G	G/B	TO MAIN HARNESS
30G	BR/Y	TO MAIN HARNESS
31G	P	TO MAIN HARNESS - (WITH CUMMINS 5.0L)
31G	R	TO MAIN HARNESS - (WITH VK56VD)
32G	P	TO MAIN HARNESS
33G	Y/L	TO MAIN HARNESS
34G	GR	TO MAIN HARNESS
35G	G/R	TO MAIN HARNESS
36G	SB	TO MAIN HARNESS
37G	R/W	TO MAIN HARNESS
38G	BR	TO MAIN HARNESS
39G	BR	TO MAIN HARNESS
40G	–	TO MAIN HARNESS
41G	R/G	TO MAIN HARNESS
42G	O	TO MAIN HARNESS
43G	B	TO MAIN HARNESS - (WITH CUMMINS 5.0L)
43G	G	TO MAIN HARNESS - (WITH VK56VD)
44G	R/Y	TO MAIN HARNESS
45G	G	TO MAIN HARNESS
46G	LG	TO MAIN HARNESS
47G	R	TO MAIN HARNESS
48G	W	TO MAIN HARNESS
49G	–	TO MAIN HARNESS
50G	BR	TO MAIN HARNESS
51G	R	TO MAIN HARNESS
52G	L	TO MAIN HARNESS
53G	W	TO MAIN HARNESS
54G	W	TO MAIN HARNESS
55G	G	TO MAIN HARNESS
56G	W	TO MAIN HARNESS
57G	Y	TO MAIN HARNESS
58G	BG	TO MAIN HARNESS
59G	BG	TO MAIN HARNESS
60G	BG	TO MAIN HARNESS
61G	B	TO MAIN HARNESS
62G	W	TO MAIN HARNESS
63G	R	TO MAIN HARNESS
64G	W/L	TO MAIN HARNESS
65G	W/R	TO MAIN HARNESS
66G	BG	TO MAIN HARNESS
67G	BG	TO MAIN HARNESS
68G	B	TO MAIN HARNESS
69G	Y	TO MAIN HARNESS
70G	L	TO MAIN HARNESS
71G	R/W	TO MAIN HARNESS

Terminal No.	Color of Wire	Signal Name
72G	L/W	TO MAIN HARNESS
73G	SHIELD	TO MAIN HARNESS
74G	W	TO MAIN HARNESS
75G	R	TO MAIN HARNESS
76G	R/G	TO MAIN HARNESS
77G	G	TO MAIN HARNESS
78G	W	TO MAIN HARNESS
79G	–	TO MAIN HARNESS
80G	R	TO MAIN HARNESS
81G	L	TO MAIN HARNESS
82G	R	TO MAIN HARNESS
83G	L	TO MAIN HARNESS
84G	L	TO MAIN HARNESS
85G	W/B	TO MAIN HARNESS
86G	B/R	TO MAIN HARNESS
87G	W/B	TO MAIN HARNESS
88G	P	TO MAIN HARNESS
89G	L	TO MAIN HARNESS
90G	G	TO MAIN HARNESS
91G	G	TO MAIN HARNESS
92G	V/W	TO MAIN HARNESS
93G	BR	TO MAIN HARNESS
94G	G	TO MAIN HARNESS
95G	G	TO MAIN HARNESS
96G	W	TO MAIN HARNESS
97G	R	TO MAIN HARNESS
98G	W/B	TO MAIN HARNESS
99G	BR	TO MAIN HARNESS
100G	GR/W	TO MAIN HARNESS

Connector No.	E208
Connector Name	WIRE TO WIRE
Connector Type	RH08MB
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG	TO ENGINE ROOM HARNESS
2	BG	TO ENGINE ROOM HARNESS
3	W	TO ENGINE ROOM HARNESS
4	BG	TO ENGINE ROOM HARNESS
5	W	TO ENGINE ROOM HARNESS
6	W/L	TO ENGINE ROOM HARNESS
7	W	TO ENGINE ROOM HARNESS
8	W/R	TO ENGINE ROOM HARNESS

Connector No.	E221
Connector Name	FRONT SONAR SENSOR LH OUTER
Connector Type	RH03FB
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	W	GROUND
2	BG	SIGNAL
3	–	–

Connector No.	E222
Connector Name	FRONT SONAR SENSOR RH OUTER
Connector Type	RH03FB
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG	GROUND
2	BG	SIGNAL
3	–	–

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SONAR SYSTEM CONNECTORS

Connector No.	E223
Connector Name	FRONT SONAR SENSOR LH INNER
Connector Type	RH03FB
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	W	GROUND
2	W/R	SIGNAL
3	–	–

Connector No.	E224
Connector Name	FRONT SONAR SENSOR RH INNER
Connector Type	RH03FB
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	W	GROUND
2	W/L	SIGNAL
3	–	–

Connector No.	F14
Connector Name	WIRE TO WIRE
Connector Type	TH24FW-NH
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	L/R	TO ENGINE ROOM HARNESS
2	BR	TO ENGINE ROOM HARNESS
3	V	TO ENGINE ROOM HARNESS
4	L/O	TO ENGINE ROOM HARNESS
5	W	TO ENGINE ROOM HARNESS
6	B/R	TO ENGINE ROOM HARNESS
7	Y/R	TO ENGINE ROOM HARNESS
8	BR	TO ENGINE ROOM HARNESS
9	W/L	TO ENGINE ROOM HARNESS
10	L/Y	TO ENGINE ROOM HARNESS
11	SB	TO ENGINE ROOM HARNESS
12	L	TO ENGINE ROOM HARNESS
13	W/R	TO ENGINE ROOM HARNESS
14	Y	TO ENGINE ROOM HARNESS
15	B	TO ENGINE ROOM HARNESS
16	B	TO ENGINE ROOM HARNESS
17	R	TO ENGINE ROOM HARNESS
18	B	TO ENGINE ROOM HARNESS
19	B/R	TO ENGINE ROOM HARNESS
20	GR	TO ENGINE ROOM HARNESS
21	V/R	TO ENGINE ROOM HARNESS
22	SHIELD	TO ENGINE ROOM HARNESS
23	SHIELD	TO ENGINE ROOM HARNESS
24	P	TO ENGINE ROOM HARNESS

Connector No.	F33
Connector Name	WIRE TO WIRE
Connector Type	NS04FW-CS
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	L	TO ENGINE ROOM HARNESS
2	W	TO ENGINE ROOM HARNESS
3	P	TO ENGINE ROOM HARNESS
4	SB	TO ENGINE ROOM HARNESS

Connector No.	F46
Connector Name	A/T ASSEMBLY (WITH VK56VD)
Connector Type	RK10FG
Connector Color	GREEN

H.S.

Terminal No.	Color of Wire	Signal Name
1	Y/R	VIGN
2	P	BATT
3	L	CAN-H
4	BR	K-LINE
5	B	GND
6	Y/R	VIGN
7	R	REV LAMP RELAY
8	P	CAN-L
9	B/R	STARTER RELAY
10	B	GND

Connector No.	F209
Connector Name	WIRE TO WIRE
Connector Type	RK26MGY-RS20-X6
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1F	Y/R	TO ENGINE ROOM HARNESS
2F	B	TO ENGINE ROOM HARNESS
3F	B/Y	TO ENGINE ROOM HARNESS
4F	W/R	TO ENGINE ROOM HARNESS
5F	B/R	TO ENGINE ROOM HARNESS
6F	O/L	TO ENGINE ROOM HARNESS
7F	GR	TO ENGINE ROOM HARNESS
8F	P	TO ENGINE ROOM HARNESS
9F	BR/W	TO ENGINE ROOM HARNESS
10F	G/Y	TO ENGINE ROOM HARNESS
11F	L/W	TO ENGINE ROOM HARNESS
12F	R/W	TO ENGINE ROOM HARNESS
13F	G/Y	TO ENGINE ROOM HARNESS
14F	V/W	TO ENGINE ROOM HARNESS
15F	LG	TO ENGINE ROOM HARNESS
16F	R/Y	TO ENGINE ROOM HARNESS
17F	BR/Y	TO ENGINE ROOM HARNESS
18F	R	TO ENGINE ROOM HARNESS
19F	V	TO ENGINE ROOM HARNESS
20F	BR	TO ENGINE ROOM HARNESS
21F	L/R	TO ENGINE ROOM HARNESS
22F	L/LG	TO ENGINE ROOM HARNESS
23F	SB	TO ENGINE ROOM HARNESS
24F	W/L	TO ENGINE ROOM HARNESS
25F	W/B	TO ENGINE ROOM HARNESS
26F	B/Y	TO ENGINE ROOM HARNESS
27F	Y	TO ENGINE ROOM HARNESS
28F	W/R	TO ENGINE ROOM HARNESS
29F	L/O	TO ENGINE ROOM HARNESS
30F	B	TO ENGINE ROOM HARNESS
31F	B	TO ENGINE ROOM HARNESS
32F	V	TO ENGINE ROOM HARNESS
33F	B/G	TO ENGINE ROOM HARNESS
34F	L/R	TO ENGINE ROOM HARNESS
35F	R/W	TO ENGINE ROOM HARNESS
36F	L/B	TO ENGINE ROOM HARNESS
37F	L/O	TO ENGINE ROOM HARNESS
38F	Y/W	TO ENGINE ROOM HARNESS
39F	R/Y	TO ENGINE ROOM HARNESS
40F	G/B	TO ENGINE ROOM HARNESS
41F	W	TO ENGINE ROOM HARNESS
42F	Y	TO ENGINE ROOM HARNESS
43F	B/P	TO ENGINE ROOM HARNESS
44F	Y/B	TO ENGINE ROOM HARNESS
45F	L/Y	TO ENGINE ROOM HARNESS
46F	O	TO ENGINE ROOM HARNESS
47F	W/L	TO ENGINE ROOM HARNESS
48F	L	TO ENGINE ROOM HARNESS
49F	BR	TO ENGINE ROOM HARNESS
50F	SHIELD	TO ENGINE ROOM HARNESS
51F	L	TO ENGINE ROOM HARNESS
52F	BR	TO ENGINE ROOM HARNESS

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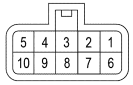
SONAR SYSTEM CONNECTORS

Connector No.	F212
Connector Name	TRANSMISSION RANGE SWITCH
Connector Type	HS10FB
Connector Color	BLACK

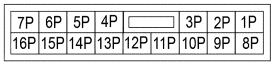
H.S.



Terminal No.	Color of Wire	Signal Name
1	L/W	RANGE SIGNAL C
2	P	RANGE SIGNAL B
3	R/Y	IGNITION
4	GR	RANGE SIGNAL PA
5	Y/R	RANGE SIGNAL A
6	O/L	BATTERY
7	R	REVERSE RELAY CONT
8	B/R	NP SW
9	BR/Y	IGNITION RELAY
10	–	–

Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FW-CS
Connector Color	WHITE

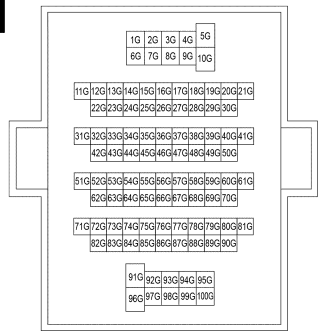
H.S.



Terminal No.	Color of Wire	Signal Name
1P	R	IGNITION
2P	Y	IGNITION
3P	G	IGNITION RELAY OUT
4P	B/W	RR DEF RLY
5P	B/W	RR DEF RLY
6P	O	RR DEF RLY OUT
7P	G	IGNITION
8P	W	IGNITION
9P	L	BATTERY
10P	–	–
11P	–	–
12P	–	–
13P	R	BATTERY
14P	Y	BATTERY
15P	Y/LG	BATTERY
16P	W	BLOWER FAN RELAY OUT

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4
Connector Color	WHITE

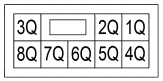
H.S.



Terminal No.	Color of Wire	Signal Name
1G	G	TO ENGINE ROOM HARNESS
2G	B/R	TO ENGINE ROOM HARNESS
3G	W	TO ENGINE ROOM HARNESS
4G	BR/W	TO ENGINE ROOM HARNESS
5G	–	TO ENGINE ROOM HARNESS
6G	R/W	TO ENGINE ROOM HARNESS
7G	Y	TO ENGINE ROOM HARNESS
8G	G	TO ENGINE ROOM HARNESS
9G	R	TO ENGINE ROOM HARNESS
10G	W	TO ENGINE ROOM HARNESS
11G	R/G	TO ENGINE ROOM HARNESS
12G	W/B	TO ENGINE ROOM HARNESS
13G	BR	TO ENGINE ROOM HARNESS
14G	Y/B	TO ENGINE ROOM HARNESS
15G	G/W	TO ENGINE ROOM HARNESS
16G	G	TO ENGINE ROOM HARNESS
17G	O	TO ENGINE ROOM HARNESS
18G	G/Y	TO ENGINE ROOM HARNESS
19G	Y/V	TO ENGINE ROOM HARNESS
20G	G/Y	TO ENGINE ROOM HARNESS
21G	B/Y	TO ENGINE ROOM HARNESS
22G	G/R	TO ENGINE ROOM HARNESS
23G	Y/R	TO ENGINE ROOM HARNESS
24G	G/B	TO ENGINE ROOM HARNESS
25G	R/W	TO ENGINE ROOM HARNESS
26G	R	TO ENGINE ROOM HARNESS
27G	LG	TO ENGINE ROOM HARNESS
28G	G/B	TO ENGINE ROOM HARNESS
29G	G/B	TO ENGINE ROOM HARNESS
30G	BR/Y	TO ENGINE ROOM HARNESS
31G	R	TO ENGINE ROOM HARNESS
32G	R	TO ENGINE ROOM HARNESS
33G	Y/L	TO ENGINE ROOM HARNESS
34G	GR	TO ENGINE ROOM HARNESS
35G	G/R	TO ENGINE ROOM HARNESS
36G	SB	TO ENGINE ROOM HARNESS
37G	R/W	TO ENGINE ROOM HARNESS
38G	BR	TO ENGINE ROOM HARNESS
39G	BR	TO ENGINE ROOM HARNESS
40G	–	TO ENGINE ROOM HARNESS
41G	R/G	TO ENGINE ROOM HARNESS
42G	O	TO ENGINE ROOM HARNESS
43G	G	TO ENGINE ROOM HARNESS
44G	R/Y	TO ENGINE ROOM HARNESS
45G	G	TO ENGINE ROOM HARNESS
46G	LG	TO ENGINE ROOM HARNESS
47G	R	TO ENGINE ROOM HARNESS
48G	W	TO ENGINE ROOM HARNESS
49G	–	TO ENGINE ROOM HARNESS
50G	BR	TO ENGINE ROOM HARNESS
51G	R	TO ENGINE ROOM HARNESS
52G	L	TO ENGINE ROOM HARNESS
53G	W	TO ENGINE ROOM HARNESS
54G	W	TO ENGINE ROOM HARNESS
55G	G	TO ENGINE ROOM HARNESS
56G	W	TO ENGINE ROOM HARNESS
57G	Y	TO ENGINE ROOM HARNESS
58G	BG	TO ENGINE ROOM HARNESS
59G	BG	TO ENGINE ROOM HARNESS
60G	BG	TO ENGINE ROOM HARNESS
61G	O	TO ENGINE ROOM HARNESS
62G	W	TO ENGINE ROOM HARNESS
63G	O	TO ENGINE ROOM HARNESS
64G	W/L	TO ENGINE ROOM HARNESS
65G	W/R	TO ENGINE ROOM HARNESS
66G	BG	TO ENGINE ROOM HARNESS
67G	O	TO ENGINE ROOM HARNESS
68G	B	TO ENGINE ROOM HARNESS
69G	Y	TO ENGINE ROOM HARNESS
70G	L	TO ENGINE ROOM HARNESS
71G	R/W	TO ENGINE ROOM HARNESS
72G	L/W	TO ENGINE ROOM HARNESS
73G	SHIELD	TO ENGINE ROOM HARNESS
74G	W	TO ENGINE ROOM HARNESS
75G	R	TO ENGINE ROOM HARNESS
76G	R/G	TO ENGINE ROOM HARNESS
77G	BG	TO ENGINE ROOM HARNESS
78G	P	TO ENGINE ROOM HARNESS
79G	–	TO ENGINE ROOM HARNESS
80G	R	TO ENGINE ROOM HARNESS
81G	L	TO ENGINE ROOM HARNESS
82G	R	TO ENGINE ROOM HARNESS
83G	L	TO ENGINE ROOM HARNESS
84G	L	TO ENGINE ROOM HARNESS
85G	W	TO ENGINE ROOM HARNESS
86G	B/R	TO ENGINE ROOM HARNESS
87G	W	TO ENGINE ROOM HARNESS
88G	G	TO ENGINE ROOM HARNESS
89G	P	TO ENGINE ROOM HARNESS
90G	G	TO ENGINE ROOM HARNESS
91G	P	TO ENGINE ROOM HARNESS
92G	V/W	TO ENGINE ROOM HARNESS
93G	BR	TO ENGINE ROOM HARNESS
94G	B	TO ENGINE ROOM HARNESS
95G	G	TO ENGINE ROOM HARNESS
96G	R	TO ENGINE ROOM HARNESS
97G	R	TO ENGINE ROOM HARNESS
98G	W/B	TO ENGINE ROOM HARNESS
99G	R	TO ENGINE ROOM HARNESS
100G	GR/W	TO ENGINE ROOM HARNESS

Connector No.	M39
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS08FW-CS
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
1Q	–	–
2Q	O/L	IGNITION
3Q	–	–
4Q	–	–
5Q	–	–
6Q	R/W	BATTERY
7Q	R/W	IGNITION
8Q	–	–

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SONAR SYSTEM CONNECTORS

Connector No.	M70
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FBR-CS
Connector Color	BROWN

H.S.

7R	6R	5R	4R		3R	2R	1R
16R	15R	14R	13R	12R	11R	10R	9R	8R

Terminal No.	Color of Wire	Signal Name
1R	L	TAIL LAMP 2
2R	G/R	IGNITION
3R	Y/R	BATTERY
4R	–	–
5R	W	BATTERY
6R	G/W	ACCESSORY
7R	–	–
8R	–	–
9R	–	–
10R	W	BATTERY
11R	–	–
12R	BG	BATTERY
13R	B	ACCESSORY
14R	G/Y	BATTERY
15R	Y	BATTERY
16R	G/R	ACCESSORY

Connector No.	M114
Connector Name	SONAR CONTROL UNIT
Connector Type	TH24FW-NH
Connector Color	WHITE

H.S.

12	11	10	9	8	7	6	5	4	3	2	1
24	23	22	21	20	19	18	17	16	15	14	13

Terminal No.	Color of Wire	Signal Name
1	W/L	FRONT INNER RIGHT SENSOR SIGNAL
2	W/R	FRONT INNER LEFT SENSOR SIGNAL
3	O	FRONT OUTER LEFT SENSOR SIGNAL
4	BG	FRONT OUTER RIGHT SENSOR SIGNAL
5	L	CAN-H
6	R	CAN-L
7	–	–
8	–	–
9	L	REAR INNER RIGHT SENSOR SIGNAL
10	O	REAR OUTER RIGHT SENSOR SIGNAL
11	–	–
12	G/R	IGN
13	W	FRONT SENSOR GND
14	BG	REAR SENSOR GND
15	B	SYSTEM GND
16	G	SWITCH INPUT (WITHOUT DRIVER ASSISTANCE SYSTEM)
16	–	- (WITH DRIVER ASSISTANCE SYSTEM)
17	G/B	STATUS LED (WITHOUT DRIVER ASSISTANCE SYSTEM)
17	–	- (WITH DRIVER ASSISTANCE SYSTEM)
18	G	SPEAKER 2 (FRONT) SIGNAL -
19	W	SPEAKER POWER
20	–	–
21	Y	REAR INNER LEFT SENSOR SIGNAL
22	B	REAR OUTER LEFT SENSOR SIGNAL
23	–	–
24	G/W	REVERSE POSITION INPUT

Connector No.	M73
Connector Name	BACK-UP LAMP RELAY
Connector Type	M06FBR-R-LC
Connector Color	BROWN

H.S.

2	1
7	5
6	3

Terminal No.	Color of Wire	Signal Name
1	G	GROUND
2	R	REV LAMP RELAY CONTROL
3	G	IGNITION
5	G/W	REVERSE
6	W/B	BATTERY
7	Y/R	REVERSE

Connector No.	M116
Connector Name	FRONT SONAR BUZZER
Connector Type	TH04FW-NH
Connector Color	WHITE

H.S.

4	3	2	1

Terminal No.	Color of Wire	Signal Name
1	–	–
2	W	SOUNDER +
3	G	SOUNDER -
4	–	–

Connector No.	M117
Connector Name	SONAR SYSTEM OFF SWITCH
Connector Type	TH08FGY-NH
Connector Color	GRAY

H.S.

4	3	2	1
8	7	6	5

Terminal No.	Color of Wire	Signal Name
1	L	ILLUMINATION +
2	–	–
3	BR	IND -(WITH DRIVER ASSISTANCE)
3	B	IND -(WITHOUT DRIVER ASSISTANCE)
4	GR	ILLUMINATION -
5	G	IND +(WITH DRIVER ASSISTANCE)
5	G/B	IND +(WITHOUT DRIVER ASSISTANCE)
6	G	BACKUP ECU
7	–	–
8	B	GND

Connector No.	M128
Connector Name	ADAS CONTROL UNIT
Connector Type	TH24FW-NH
Connector Color	WHITE

H.S.

12	11	10	9	8	7	6	5	4	3	2	1
24	23	22	21	20	19	18	17	16	15	14	13

Terminal No.	Color of Wire	Signal Name
1	B	GND
2	L	ITS CAN-H
3	G	IGN
4	GR	BUZZER OUTPUT
5	R	ITS CAN-L
6	R	CAN-L
7	G/R	SW LED
8	–	–
9	L	CAN-H
10	P	CAN-L
11	G	N.C
12	–	–
13	–	–
14	–	–
15	–	–
16	–	–
17	BR	N.C
18	L	CAN-H
19	–	–
20	–	–
21	–	–
22	–	–
23	LG	BSW SW
24	–	–

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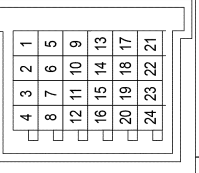
SONAR SYSTEM CONNECTORS

Connector No.	M191
Connector Name	JOINT CONNECTOR-M01
Connector Type	NH24FW-J
Connector Color	WHITE

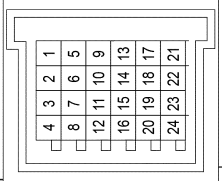
H.S.



Terminal No.	Color of Wire	Signal Name
1	–	–
2	B	GND
3	B	GND
4	B	GROUND
5	–	–
6	B	GND
7	B	GND
8	B	GND
9	–	–
10	B	GND
11	B	GND
12	B	GND
13	B	GND
14	B	GND
15	B	GND
16	–	–
17	B	GND
18	B	GND
19	SHIELD	GROUND
20	B	GND
21	B	GND
22	B	GND
23	B	GROUND
24	B	GROUND

Connector No.	M192
Connector Name	JOINT CONNECTOR-M02
Connector Type	NH24FW-J
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
1	B	GROUND
2	B	GND
3	B	GROUND
4	–	–
5	B	GROUND
6	B	GND
7	B	GROUND
8	B	GROUND
9	B	GROUND
10	B	GND
11	B	GROUND
12	B	GND
13	–	–
14	B	GND
15	B	GROUND
16	B	GND
17	–	–
18	SHIELD	SHIELD
19	SHIELD	SHIELD
20	SHIELD	SHIELD
21	B	GND
22	B	GND
23	B	GROUND
24	B	GROUND

AANIA5301GB

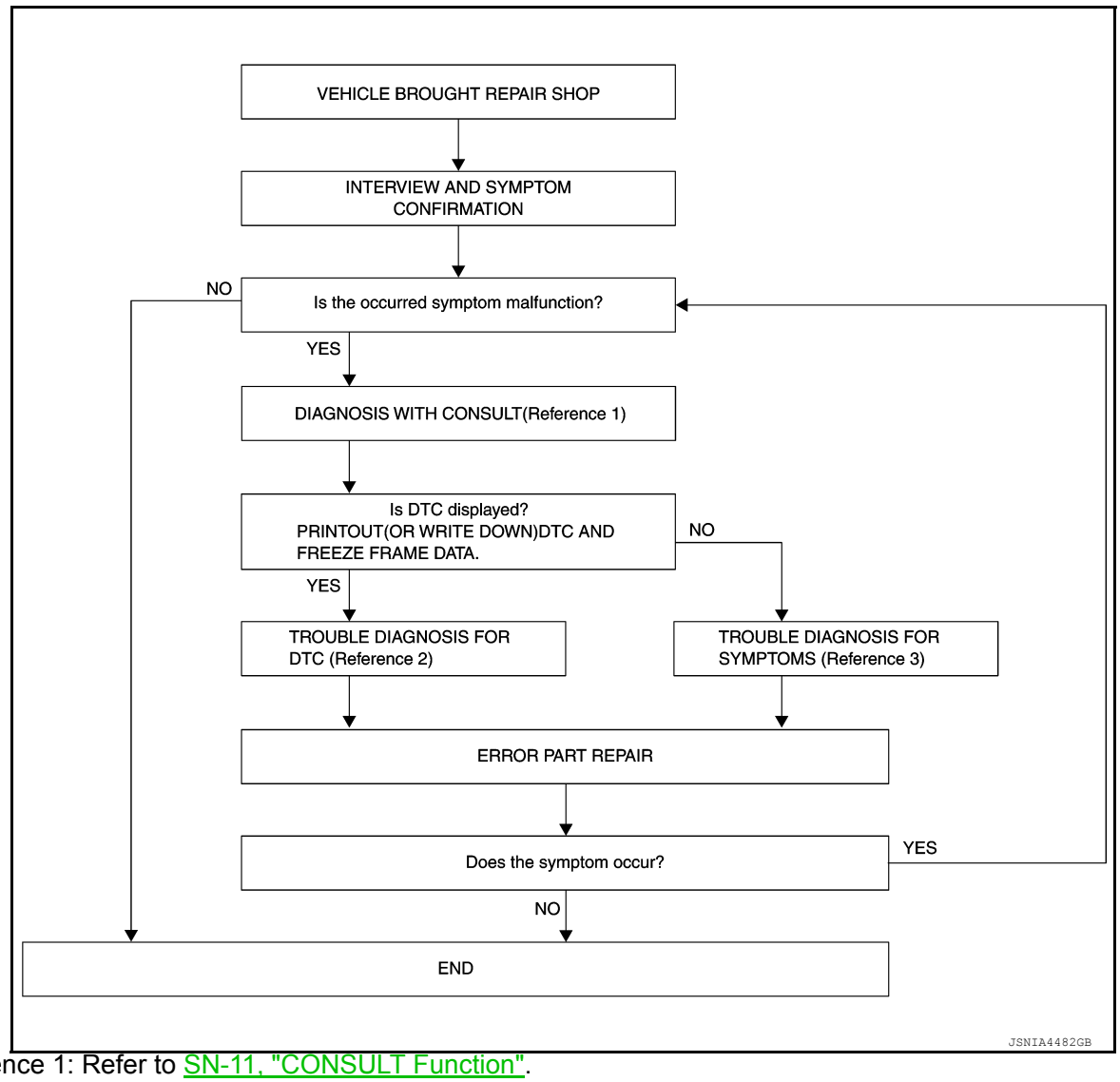
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000014386742

OVERALL SEQUENCE



Reference 1: Refer to SN-11, "CONSULT Function".
Reference 2: Refer to SN-18, "DTC Index".
Reference 3: Refer to SN-62, "Symptom Table".

DETAILED FLOW

1.INTERVIEW AND SYMPTOM CONFIRMATION

Check the malfunction symptoms by performing the following items.
- Interview the customer to obtain the malfunction information (conditions and environment when the malfunction occurred).
- Check the symptom.

Is the occurred symptom malfunction?

YES >> GO TO 2.
NO >> Inspection End.

2.DIAGNOSIS WITH CONSULT

1. Connect CONSULT and perform Self Diagnostic Result for SONAR. Refer to SN-11, "CONSULT Function".

NOTE:
Skip to step 4 of the diagnosis procedure if SONAR is not displayed.

2. When DTC is detected, follow the instructions below:

- Record DTC and Freeze Frame Data.

Is DTC displayed?

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

3. TROUBLE DIAGNOSIS FOR DTC

1. Check the DTC indicated in the self-diagnosis results.
2. Perform the relevant diagnosis referring to the DTC Index. Refer to SN-18, "DTC Index".

>> GO TO 5.

4. TROUBLE DIAGNOSIS FOR SYMPTOMS

Perform the relevant diagnosis referring to the diagnosis chart by symptom. Refer to SN-62, "Symptom Table".

>> GO TO 5.

5. ERROR PART REPAIR

1. Repair or replace the identified malfunctioning parts.
2. Perform Self Diagnostic Result for SONAR with CONSULT.

NOTE:
Erase the stored self-diagnosis results after repairing or replacing the relevant components if any DTC has been indicated in the self-diagnosis results.

3. Check that the symptom does not occur.

Does the symptom occur?

YES >> GO TO 1.
NO >> Inspection End.

INSPECTION AND ADJUSTMENT

ADDITIONAL SERVICE WHEN REPLACING SONAR CONTROL UNIT

ADDITIONAL SERVICE WHEN REPLACING SONAR CONTROL UNIT : Description

INFOID:0000000014386743

BEFORE REPLACEMENT

When replacing sonar control unit, save or print current vehicle specification with CONSULT configuration before replacement.

NOTE:

If “Before Replace ECU” cannot be used, use the “After Replace ECU” or “Manual Configuration” after replacing sonar control unit.

AFTER REPLACEMENT

CAUTION:

When replacing sonar control unit, you must perform “After Replace ECU” with CONSULT.

- **Complete the procedure of “After Replace ECU” in order.**
- **If you set incorrect “After Replace ECU”, incidents might occur.**
- **Configuration is different for each vehicle model. Confirm configuration of each vehicle model.**

ADDITIONAL SERVICE WHEN REPLACING SONAR CONTROL UNIT : Work Procedure

INFOID:0000000014386744

1. SAVING VEHICLE SPECIFICATION

CONSULT

Enter “Re/Programming, Configuration” and perform “Before Replace ECU” to save or print current vehicle specification.

NOTE:

If “Before Replace ECU” cannot be used, use the “After Replace ECU” or “Manual Configuration” after replacing sonar control unit.

>> GO TO 2.

2. REPLACE SONAR CONTROL UNIT

Replace sonar control unit. Refer to SN-66, "Removal and Installation".

>> GO TO 3.

3. WRITING VEHICLE SPECIFICATION

CONSULT

1. Enter "Re/Programming, Configuration".
2. If “Before Replace ECU” operation was performed, an "Operation Log Selection" screen will automatically be displayed. Select the applicable file from the "Saved Data List" and press “Confirm” to write vehicle specification. Refer to SN-32, "CONFIGURATION (SONAR CONTROL UNIT) : Work Procedure".
3. If “Before Replace ECU” operation was not performed, select "After Replace ECU" or "Manual Configuration" to write vehicle specification. Refer to SN-32, "CONFIGURATION (SONAR CONTROL UNIT) : Work Procedure".

>> GO TO 4.

4. OPERATION CHECK

Check that the operation of the sonar control unit is normal.

>> Work End.

CONFIGURATION (SONAR CONTROL UNIT)

CONFIGURATION (SONAR CONTROL UNIT) : Description

INFOID:0000000014386745

Vehicle specification needs to be written with CONSULT. Configuration has three functions as follows:

Function	Description
"Before Replace ECU"	• Reads the vehicle configuration of current sonar control unit. • Saves the read vehicle configuration.
"After Replace ECU"	Writes the vehicle configuration with manual selection.
"Select Saved Data List"	Writes the vehicle configuration with saved data.

CAUTION:

- **When replacing sonar control unit, you must perform “Select Saved Data List” or "After Replace ECU" with CONSULT.**
- **Complete the procedure of “Select Saved Data List” or "After Replace ECU" in order.**
- **If you set incorrect “Select Saved Data List” or "After Replace ECU", incidents might occur.**
- **Configuration is different for each vehicle model. Confirm configuration of each vehicle model.**
- **Never perform “Select Saved Data List” or "After Replace ECU" except for new sonar control unit.**

CONFIGURATION (SONAR CONTROL UNIT) : Work Procedure

INFOID:0000000014386746

1.WRITING MODE SELECTION

CONSULT

Select “Reprogramming, Configuration” of sonar control unit.

When writing saved data>>GO TO 2.
When writing manually>>GO TO 3.

2.PERFORM “SAVED DATA LIST”

CONSULT

Automatically “Operation Log Selection” window will display if “Before Replace ECU” was performed. Select applicable file from the “Save Data List” and press “Confirm”.

>> Work End.

3.PERFORM “AFTER REPLACE ECU” OR “MANUAL CONFIGURATION”

CONSULT

1. Select “After Replace ECU” or “Manual Configuration”.
2. Identify the correct model and configuration list. Refer to SN-33, "CONFIGURATION (SONAR CONTROL UNIT) : Configuration List".
3. Confirm and/or change setting value for each item.
   CAUTION:
   Thoroughly read and understand the vehicle specification. ECU control may not operate normally if the setting is not correct.
4. Select “Next”.
   CAUTION:
   Make sure to select “Next”, confirm each setting value and press “OK” even if the indicated configuration of brand new sonar control unit is same as the desirable configuration. If not, configuration which is set automatically by selecting vehicle model can not be memorized.
5. When "Completed", select "End".

>> GO TO 4.

4.OPERATION CHECK

Confirm that each function controlled by sonar control unit operates normally.

>> Work End.

CONFIGURATION (SONAR CONTROL UNIT) : Configuration List

INFOID:0000000014386747

CAUTION:

Thoroughly read and understand the vehicle specification. Incorrect settings may result in abnormal control of ECU.

MANUAL SETTING ITEM	
Items	Setting value
Fr Bumper Sonar	MODE 1 ⇔ MODE 2
BSW	WITH ⇔ WITHOUT
AVM	WITH ⇔ WITHOUT

⇔: Items which confirm vehicle specifications

DTC/CIRCUIT DIAGNOSIS

U1000 CAN COMM CIRCUIT

DTC Description

INFOID:0000000014386748

DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real-time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independently). In CAN communication, control units are connected with 2 communication lines (CAN high, CAN low) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.
CAN Communication Signal Chart. Refer to LAN-74, "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart".

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
U1000	CAN COMM CIRCUIT (CAN COMM CIRCUIT)	Diagnosis condition	When ignition switch is ON.
		Signal (terminal)	—
		Threshold	—
		Diagnosis delay time	—

POSSIBLE CAUSE

CAN communication system

FAIL-SAFE

- When communication with the ABS actuator and electric unit (control unit) is lost, the front sonar system is OFF and rear sonar systems is ON (shift selector in reverse).
- When communication with the TCU is lost, front and rear sonar systems are OFF.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

CONSULT
1. Turn ignition switch ON.
2. Perform “Self Diagnostic Result” mode of “SONAR”.

Is DTC U1000 detected?

YES >> Proceed to SN-34, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-47, "Intermittent Incident".
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014386749

1.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

CONSULT
1. Turn ignition switch ON.
2. Erase DTC.
3. Perform “Self Diagnostic Result” mode of “SONAR”.

Is DTC U1000 detected?

YES >> Perform the trouble diagnosis for CAN communication system. Refer to LAN-53, "Trouble Diagnosis Flow Chart".
NO >> Inspection End.

U1010 CONTROL UNIT (CAN)

DTC Description

INFOID:0000000014386750

DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real-time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independently). In CAN communication, control units are connected with 2 communication lines (CAN high, CAN low) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.
CAN Communication Signal Chart. Refer to LAN-74, "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart".

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
U1010	CONTROL UNIT(CAN) [Control unit (CAN)]	Diagnosis condition	When ignition switch is ON.
		Signal (terminal)	—
		Threshold	—
		Diagnosis delay time	—

POSSIBLE CAUSE

CAN communication system

FAIL-SAFE

—

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

CONSULT
1. Turn ignition switch ON.
2. Perform “Self Diagnostic Result” mode of “SONAR”.

Is DTC U1010 detected?

YES >> Proceed to SN-35, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-47, "Intermittent Incident".
NO-2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014386751

1.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

CONSULT
1. Turn ignition switch ON.
2. Erase DTC.
3. Perform “Self Diagnostic Result” mode of “SONAR”.

Is DTC U1010 detected?

YES >> Replace sonar control unit. Refer to SN-66, "Removal and Installation".
NO >> Inspection End.

B2720 CORNER SENSOR [RL]

DTC Description

INFOID:0000000014386752

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	
B2720	Rear left side external sensor (Rear sonar sensor LH outer)	1	Diagnosis condition	When ignition switch is ON and power supply voltage is 8.5V – 16.5V.
			Signal (terminal)	Rear outer left sensor signal (terminal 22)
			Threshold	Rear outer left sensor signal circuit is open or short to ground
			Diagnosis delay time	—
		2	Diagnosis condition	When ignition switch is ON and power supply voltage is 8.5V – 16.5V.
			Signal (terminal)	Rear outer left sensor signal (terminal 22)
			Threshold	Rear outer left sensor signal circuit is short to voltage
			Diagnosis delay time	—
		3	Diagnosis condition	When ignition switch is ON and power supply voltage is 9.5V – 16.5V.
			Signal (terminal)	Rear outer left sensor signal (terminal 22)
			Threshold	Rear sonar sensor LH outer element malfunction
			Diagnosis delay time	—

POSSIBLE CAUSE

- Harness or connectors
- Rear sonar sensor LH outer

FAIL-SAFE

- Obstacle detection of rear sonar sensor LH outer is stopped
- Audible warning (front sonar buzzer) of all sensors is stopped
- Front sonar buzzer sounds for 3 seconds

DTC CONFIRMATION PROCEDURE

1.DTC CONFIRMATION PROCEDURE

CONSULT

1. Turn ignition switch ON.
2. Perform “Self Diagnostic Result” mode of “SONAR”.

Is DTC B2720 detected?

YES >> Refer to SN-36, "Diagnosis Procedure".
NO–1 >> To check malfunction symptom before repair: Refer to GI-47, "Intermittent Incident".
NO–2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014386753

Regarding Wiring Diagram information, refer to SN-19, "Wiring Diagram".

1.CHECK REAR OUTER LEFT SENSOR SIGNAL CIRCUIT FOR OPEN OR SHORT TO GROUND

1. Turn ignition switch OFF.

2. Disconnect sonar control unit and rear sonar sensor LH outer connectors.
3. Check continuity between sonar control unit connector M114 and rear sonar sensor LH outer connector C114.

Sonar control unit		Rear sonar sensor LH outer		Continuity
Connector	Terminal	Connector	Terminal	
M114	22	C114	2	Yes

4. Check continuity between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Continuity
Connector	Terminal		
M114	22	(–)	No

Is the inspection result normal?

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

2.CHECK REAR OUTER LEFT SENSOR SIGNAL CIRCUIT FOR SHORT TO VOLTAGE

1. Turn ignition switch ON.
2. Check voltage between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M114	22	(–)	0V

Is the inspection result normal?

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

3.CHECK REAR SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Check continuity between sonar control unit connector M114 and rear sonar sensor LH outer connector C114.

Sonar control unit		Rear sonar sensor LH outer		Continuity
Connector	Terminal	Connector	Terminal	
M114	14	C114	1	Yes

Is the inspection result normal?

YES >> Replace rear sonar sensor LH outer. Refer to SN-64, "Removal and Installation - Rear Sonar Sensors".
NO >> Repair or replace harness or connectors.

B2721 CENTER SENSOR [RL]

DTC Description

INFOID:0000000014386754

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	
B2721	Rear left side internal sensor (Rear sonar sensor LH inner)	1	Diagnosis condition	When ignition switch is ON and power supply voltage is 8.5V – 16.5V.
			Signal (terminal)	Rear inner left sensor signal (terminal 21)
			Threshold	Rear inner left sensor signal circuit is open or short to ground
			Diagnosis delay time	—
		2	Diagnosis condition	When ignition switch is ON and power supply voltage is 8.5V – 16.5V.
			Signal (terminal)	Rear inner left sensor signal (terminal 21)
			Threshold	Rear inner left sensor signal circuit is short to voltage
			Diagnosis delay time	—
		3	Diagnosis condition	When ignition switch is ON and power supply voltage is 9.5V – 16.5V.
			Signal (terminal)	Rear inner left sensor signal (terminal 21)
			Threshold	Rear sonar sensor LH inner element malfunction
			Diagnosis delay time	—

POSSIBLE CAUSE

- Harness or connectors
- Rear sonar sensor LH inner

FAIL-SAFE

- Obstacle detection of rear sonar sensor LH inner is stopped
- Audible warning (front sonar buzzer) of all sensors is stopped
- Front sonar buzzer sounds for 3 seconds

DTC CONFIRMATION PROCEDURE

1.DTC CONFIRMATION PROCEDURE

CONSULT

1. Turn ignition switch ON.
2. Perform “Self Diagnostic Result” mode of “SONAR”.

Is DTC B2721 detected?

YES >> Refer to SN-38, "Diagnosis Procedure".
NO–1 >> To check malfunction symptom before repair: Refer to GI-47, "Intermittent Incident".
NO–2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014386755

Regarding Wiring Diagram information, refer to SN-19, "Wiring Diagram".

1.CHECK REAR INNER LEFT SENSOR SIGNAL CIRCUIT FOR OPEN OR SHORT TO GROUND

1. Turn ignition switch OFF.

2. Disconnect sonar control unit and rear sonar sensor LH inner connectors.
3. Check continuity between sonar control unit connector M114 and rear sonar sensor LH inner connector C113.

Sonar control unit		Rear sonar sensor LH inner		Continuity
Connector	Terminal	Connector	Terminal	
M114	21	C113	2	Yes

4. Check continuity between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Continuity
Connector	Terminal		
M114	21	(–)	No

Is the inspection result normal?

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

2.CHECK REAR INNER LEFT SENSOR SIGNAL CIRCUIT FOR SHORT TO VOLTAGE

1. Turn ignition switch ON.
2. Check voltage between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M114	21	(–)	0V

Is the inspection result normal?

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

3.CHECK REAR SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Check continuity between sonar control unit connector M114 and rear sonar sensor LH inner connector C113.

Sonar control unit		Rear sonar sensor LH inner		Continuity
Connector	Terminal	Connector	Terminal	
M114	14	C113	1	Yes

Is the inspection result normal?

YES >> Replace rear sonar sensor LH inner. Refer to SN-64, "Removal and Installation - Rear Sonar Sensors".
NO >> Repair or replace harness or connectors.

B2722 CENTER SENSOR [RR]

DTC Description

INFOID:0000000014386756

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	
B2722	Rear right side internal sensor (Rear sonar sensor RH inner)	1	Diagnosis condition	When ignition switch is ON and power supply voltage is 8.5V – 16.5V.
			Signal (terminal)	Rear inner right sensor signal (terminal 9)
			Threshold	Rear inner right sensor signal circuit is open or short to ground
			Diagnosis delay time	—
		2	Diagnosis condition	When ignition switch is ON and power supply voltage is 8.5V – 16.5V.
			Signal (terminal)	Rear inner right sensor signal (terminal 9)
			Threshold	Rear inner right sensor signal circuit is short to voltage
			Diagnosis delay time	—
		3	Diagnosis condition	When ignition switch is ON and power supply voltage is 9.5V – 16.5V.
			Signal (terminal)	Rear inner right sensor signal (terminal 9)
			Threshold	Rear sonar sensor RH inner element malfunction
			Diagnosis delay time	—

POSSIBLE CAUSE

- Harness or connectors
- Rear sonar sensor RH inner

FAIL-SAFE

- Obstacle detection of rear sonar sensor RH inner is stopped
- Audible warning (front sonar buzzer) of all sensors is stopped
- Front sonar buzzer sounds for 3 seconds

DTC CONFIRMATION PROCEDURE

1.DTC CONFIRMATION PROCEDURE

CONSULT

1. Turn ignition switch ON.
2. Perform “Self Diagnostic Result” mode of “SONAR”.

Is DTC B2722 detected?

YES >> Refer to SN-40, "Diagnosis Procedure".
NO–1 >> To check malfunction symptom before repair: Refer to GI-47, "Intermittent Incident".
NO–2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014386757

Regarding Wiring Diagram information, refer to SN-19, "Wiring Diagram".

1.CHECK REAR INNER RIGHT SENSOR SIGNAL CIRCUIT FOR OPEN OR SHORT TO GROUND

1. Turn ignition switch OFF.

2. Disconnect sonar control unit and rear sonar sensor RH inner connectors.
3. Check continuity between sonar control unit connector M114 and rear sonar sensor RH inner connector C112.

Sonar control unit		Rear sonar sensor RH inner		Continuity
Connector	Terminal	Connector	Terminal	
M114	9	C112	2	Yes

4. Check continuity between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Continuity
Connector	Terminal		
M114	9	(–)	No

Is the inspection result normal?

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

2.CHECK REAR INNER RIGHT SENSOR SIGNAL CIRCUIT FOR SHORT TO VOLTAGE

1. Turn ignition switch ON.
2. Check voltage between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M114	9	(–)	0V

Is the inspection result normal?

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

3.CHECK REAR SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Check continuity between sonar control unit connector M114 and rear sonar sensor RH inner connector C112.

Sonar control unit		Rear sonar sensor RH inner		Continuity
Connector	Terminal	Connector	Terminal	
M114	14	C112	1	Yes

Is the inspection result normal?

YES >> Replace rear sonar sensor RH inner. Refer to SN-64, "Removal and Installation - Rear Sonar Sensors".
NO >> Repair or replace harness or connectors.

B2723 CORNER SENSOR [RR]

DTC Description

INFOID:0000000014386758

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	
B2723	Rear right side external sensor (Rear sonar sensor RH outer)	1	Diagnosis condition	When ignition switch is ON and power supply voltage is 8.5V – 16.5V.
			Signal (terminal)	Rear outer right sensor signal (terminal 10)
			Threshold	Rear outer right sensor signal circuit is open or short to ground
			Diagnosis delay time	—
		2	Diagnosis condition	When ignition switch is ON and power supply voltage is 8.5V – 16.5V.
			Signal (terminal)	Rear outer right sensor signal (terminal 10)
			Threshold	Rear outer right sensor signal circuit is short to voltage
			Diagnosis delay time	—
		3	Diagnosis condition	When ignition switch is ON and power supply voltage is 9.5V – 16.5V.
			Signal (terminal)	Rear outer right sensor signal (terminal 10)
			Threshold	Rear sonar sensor RH outer element malfunction
			Diagnosis delay time	—

POSSIBLE CAUSE

- Harness or connectors
- Rear sonar sensor RH outer

FAIL-SAFE

- Obstacle detection of rear sonar sensor RH outer is stopped
- Audible warning (front sonar buzzer) of all sensors is stopped
- Front sonar buzzer sounds for 3 seconds

DTC CONFIRMATION PROCEDURE

1.DTC CONFIRMATION PROCEDURE

CONSULT

1. Turn ignition switch ON.
2. Perform “Self Diagnostic Result” mode of “SONAR”.

Is DTC B2723 detected?

YES >> Refer to SN-42, "Diagnosis Procedure".
NO–1 >> To check malfunction symptom before repair: Refer to GI-47, "Intermittent Incident".
NO–2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014386759

Regarding Wiring Diagram information, refer to SN-19, "Wiring Diagram".

1.CHECK REAR OUTER RIGHT SENSOR SIGNAL CIRCUIT FOR OPEN OR SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect sonar control unit and rear sonar sensor RH outer connectors.
3. Check continuity between sonar control unit connector M114 and rear sonar sensor RH outer connector C111.

Sonar control unit		Rear sonar sensor RH outer		Continuity
Connector	Terminal	Connector	Terminal	
M114	10	C111	2	Yes

4. Check continuity between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Continuity
Connector	Terminal		
M114	10	(–)	No

Is the inspection result normal?

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

2.CHECK REAR OUTER RIGHT SENSOR SIGNAL CIRCUIT FOR SHORT TO VOLTAGE

1. Turn ignition switch ON.
2. Check voltage between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M114	10	(–)	0V

Is the inspection result normal?

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

3.CHECK REAR SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Check continuity between sonar control unit connector M114 and rear sonar sensor RH outer connector C111.

Sonar control unit		Rear sonar sensor RH outer		Continuity
Connector	Terminal	Connector	Terminal	
M114	14	C111	1	Yes

Is the inspection result normal?

YES >> Replace rear sonar sensor RH outer. Refer to SN-64, "Removal and Installation - Rear Sonar Sensors".
NO >> Repair or replace harness or connectors.

B2724 SONAR CONTROL UNIT

DTC Description

INFOID:0000000014386760

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
B2724	ECU (Sonar control unit configuration)	Diagnosis condition	When ignition switch is ON.
		Signal (terminal)	—
		Threshold	—
		Diagnosis delay time	—

POSSIBLE CAUSE

- Sonar control unit configuration
- Sonar control unit

FAIL-SAFE

- Off indicator blinks periodically (500ms ON, 500ms OFF)
- Front sonar buzzer sounds for 3 seconds

DTC CONFIRMATION PROCEDURE

1.DTC CONFIRMATION PROCEDURE

CONSULT

1. Turn ignition switch ON.
2. Perform “Self Diagnostic Result” mode of “SONAR”.

Is DTC B2724 detected?

YES >> Refer to SN-44, "Diagnosis Procedure".
NO–1 >> To check malfunction symptom before repair: Refer to GI-47, "Intermittent Incident".
NO–2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014386761

1.PERFORM SONAR CONTROL UNIT CONFIGURATION PROCEDURE

CONSULT

Perform the sonar control unit configuration procedure. Refer to SN-32, "CONFIGURATION (SONAR CONTROL UNIT) : Work Procedure".

Was the configuration procedure successful?

YES >> GO TO 2.
NO >> Replace sonar control unit. Refer to SN-66, "Removal and Installation".

2.DTC CONFIRMATION PROCEDURE

CONSULT

1. Turn ignition switch ON.
2. Erase DTCs.
3. Perform “Self Diagnostic Result” mode of “SONAR”.

Is DTC B2724 detected?

YES >> Replace sonar control unit. Refer to SN-66, "Removal and Installation".
NO >> Inspection End.

B2728 LED

DTC Description

INFOID:0000000014386762

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	
B2728	Led (Sonar system off switch)	1	Diagnosis condition	When ignition switch is ON.
			Signal (terminal)	Status LED circuit (terminal 17)
			Threshold	Status LED circuit is short to ground
			Diagnosis delay time	—
		2	Diagnosis condition	When ignition switch is ON.
			Signal (terminal)	Status LED circuit (terminal 17)
			Threshold	Status LED circuit is short to voltage
			Diagnosis delay time	—
		3	Diagnosis condition	When ignition switch is ON.
			Signal (terminal)	Status LED circuit (terminal 17)
			Threshold	Status LED circuit is open
			Diagnosis delay time	—

POSSIBLE CAUSE

- Harness or connectors
- Sonar system off switch

FAIL-SAFE

- Audible warning (front sonar buzzer) of all sensors is stopped
- Front sonar buzzer sounds for 3 seconds

DTC CONFIRMATION PROCEDURE

1.DTC CONFIRMATION PROCEDURE

CONSULT

1. Turn ignition switch ON.
2. Perform “Self Diagnostic Result” mode of “SONAR”.

Is DTC B2728 detected?

YES >> Refer to SN-45, "Diagnosis Procedure".
NO–1 >> To check malfunction symptom before repair: Refer to GI-47, "Intermittent Incident".
NO–2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014386763

Regarding Wiring Diagram information, refer to SN-19, "Wiring Diagram".

1.CHECK STATUS LED CIRCUIT FOR SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect sonar control unit and sonar system off switch connectors.
3. Check continuity between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Continuity
Connector	Terminal		
M114	17	(–)	No

Is the inspection result normal?

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

2.CHECK STATUS LED CIRCUIT FOR SHORT TO VOLTAGE

1. Turn ignition switch ON.
2. Check voltage between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M114	17	(–)	0V

Is the inspection result normal?

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

3.CHECK STATUS LED CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Check continuity between sonar control unit connector M114 and sonar system off switch connector M117.

Sonar control unit		Sonar system off switch		Continuity
Connector	Terminal	Connector	Terminal	
M114	17	M117	5	Yes

Is the inspection result normal?

YES >> Replace sonar system off switch. Refer to IP-20, "Removal and Installation".
NO >> Repair or replace harness or connectors.

B2729 CORNER SENSOR [FL]

DTC Description

INFOID:0000000014386764

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	
B2729	Front left side external sensor (Front sonar sensor LH outer)	1	Diagnosis condition	When ignition switch is ON and power supply voltage is 8.5V – 16.5V.
			Signal (terminal)	Front outer left sensor signal (terminal 3)
			Threshold	Front outer left sensor signal circuit is open or short to ground
			Diagnosis delay time	—
		2	Diagnosis condition	When ignition switch is ON and power supply voltage is 8.5V – 16.5V.
			Signal (terminal)	Front outer left sensor signal (terminal 3)
			Threshold	Front outer left sensor signal circuit is short to voltage
			Diagnosis delay time	—
		3	Diagnosis condition	When ignition switch is ON and power supply voltage is 9.5V – 16.5V.
			Signal (terminal)	Front outer left sensor signal (terminal 3)
			Threshold	Front sonar sensor LH outer element malfunction
			Diagnosis delay time	—

POSSIBLE CAUSE

- Harness or connectors
- Front sonar sensor LH outer

FAIL-SAFE

- Obstacle detection of front sonar sensor LH outer is stopped
- Audible warning (front sonar buzzer) of all sensors is stopped
- Front sonar buzzer sounds for 3 seconds

DTC CONFIRMATION PROCEDURE

1.DTC CONFIRMATION PROCEDURE

CONSULT
1. Turn ignition switch ON.
2. Perform “Self Diagnostic Result” mode of “SONAR”.

Is DTC B2729 detected?

YES >> Refer to SN-47, "Diagnosis Procedure".
NO–1 >> To check malfunction symptom before repair: Refer to GI-47, "Intermittent Incident".
NO–2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014386765

Regarding Wiring Diagram information, refer to SN-19, "Wiring Diagram".

1.CHECK FRONT OUTER LEFT SENSOR SIGNAL CIRCUIT FOR OPEN OR SHORT TO GROUND

1. Turn ignition switch OFF.

2. Disconnect sonar control unit and front sonar sensor LH outer connectors.
3. Check continuity between sonar control unit connector M114 and front sonar sensor LH outer connector E221.

Sonar control unit		Front sonar sensor LH outer		Continuity
Connector	Terminal	Connector	Terminal	
M114	3	E221	2	Yes

4. Check continuity between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Continuity
Connector	Terminal		
M114	3	(–)	No

Is the inspection result normal?

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

2.CHECK FRONT OUTER LEFT SENSOR SIGNAL CIRCUIT FOR SHORT TO VOLTAGE

1. Turn ignition switch ON.
2. Check voltage between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M114	3	(–)	0V

Is the inspection result normal?

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

3.CHECK FRONT SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Check continuity between sonar control unit connector M114 and front sonar sensor LH outer connector E221.

Sonar control unit		Front sonar sensor LH outer		Continuity
Connector	Terminal	Connector	Terminal	
M114	13	E221	1	Yes

Is the inspection result normal?

YES >> Replace front sonar sensor LH outer. Refer to SN-63, "Removal and Installation - Front Sonar Sensors".
NO >> Repair or replace harness or connectors.

B272A CENTER SENSOR [FL]

DTC Description

INFOID:0000000014386766

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	
B272A	Front left side internal sensor (Front sonar sensor LH inner)	1	Diagnosis condition	When ignition switch is ON and power supply voltage is 8.5V – 16.5V.
			Signal (terminal)	Front inner left sensor signal (terminal 2)
			Threshold	Front inner left sensor signal circuit is open or short to ground
			Diagnosis delay time	—
		2	Diagnosis condition	When ignition switch is ON and power supply voltage is 8.5V – 16.5V.
			Signal (terminal)	Front inner left sensor signal (terminal 2)
			Threshold	Front inner left sensor signal circuit is short to voltage
			Diagnosis delay time	—
		3	Diagnosis condition	When ignition switch is ON and power supply voltage is 9.5V – 16.5V.
			Signal (terminal)	Front inner left sensor signal (terminal 2)
			Threshold	Front sonar sensor LH inner element malfunction
			Diagnosis delay time	—

POSSIBLE CAUSE

- Harness or connectors
- Front sonar sensor LH inner

FAIL-SAFE

- Obstacle detection of front sonar sensor LH inner is stopped
- Audible warning (front sonar buzzer) of all sensors is stopped
- Front sonar buzzer sounds for 3 seconds

DTC CONFIRMATION PROCEDURE

1.DTC CONFIRMATION PROCEDURE

CONSULT

1. Turn ignition switch ON.
2. Perform “Self Diagnostic Result” mode of “SONAR”.

Is DTC B272A detected?

YES >> Refer to SN-49, "Diagnosis Procedure".
NO–1 >> To check malfunction symptom before repair: Refer to GI-47, "Intermittent Incident".
NO–2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014386767

Regarding Wiring Diagram information, refer to SN-19, "Wiring Diagram".

1.CHECK FRONT INNER LEFT SENSOR SIGNAL CIRCUIT FOR OPEN OR SHORT TO GROUND

1. Turn ignition switch OFF.

2. Disconnect sonar control unit and front sonar sensor LH inner connectors.
3. Check continuity between sonar control unit connector M114 and front sonar sensor LH inner connector E223.

Sonar control unit		Front sonar sensor LH inner		Continuity
Connector	Terminal	Connector	Terminal	
M114	2	E223	2	Yes

4. Check continuity between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Continuity
Connector	Terminal		
M114	2	(–)	No

Is the inspection result normal?

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

2.CHECK FRONT INNER LEFT SENSOR SIGNAL CIRCUIT FOR SHORT TO VOLTAGE

1. Turn ignition switch ON.
2. Check voltage between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M114	2	(–)	0V

Is the inspection result normal?

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

3.CHECK FRONT SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Check continuity between sonar control unit connector M114 and front sonar sensor LH inner connector E223.

Sonar control unit		Front sonar sensor LH inner		Continuity
Connector	Terminal	Connector	Terminal	
M114	13	E223	1	Yes

Is the inspection result normal?

YES >> Replace front sonar sensor LH inner. Refer to SN-63, "Removal and Installation - Front Sonar Sensors".
NO >> Repair or replace harness or connectors.

B272B CENTER SENSOR [FR]

DTC Description

INFOID:0000000014386768

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	
B272B	Front right side internal sensor (Front sonar sensor RH inner)	1	Diagnosis condition	When ignition switch is ON and power supply voltage is 8.5V – 16.5V.
			Signal (terminal)	Front inner right sensor signal (terminal 1)
			Threshold	Front inner right sensor signal circuit is open or short to ground
			Diagnosis delay time	—
		2	Diagnosis condition	When ignition switch is ON and power supply voltage is 8.5V – 16.5V.
			Signal (terminal)	Front inner right sensor signal (terminal 1)
			Threshold	Front inner right sensor signal circuit is short to voltage
			Diagnosis delay time	—
		3	Diagnosis condition	When ignition switch is ON and power supply voltage is 9.5V – 16.5V.
			Signal (terminal)	Front inner right sensor signal (terminal 1)
			Threshold	Front sonar sensor RH inner element malfunction
			Diagnosis delay time	—

POSSIBLE CAUSE

- Harness or connectors
- Front sonar sensor RH inner

FAIL-SAFE

- Obstacle detection of front sonar sensor RH inner is stopped
- Audible warning (front sonar buzzer) of all sensors is stopped
- Front sonar buzzer sounds for 3 seconds

DTC CONFIRMATION PROCEDURE

1.DTC CONFIRMATION PROCEDURE

CONSULT

1. Turn ignition switch ON.
2. Perform “Self Diagnostic Result” mode of “SONAR”.

Is DTC B272B detected?

YES >> Refer to SN-51, "Diagnosis Procedure".
NO–1 >> To check malfunction symptom before repair: Refer to GI-47, "Intermittent Incident".
NO–2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014386769

Regarding Wiring Diagram information, refer to SN-19, "Wiring Diagram".

1.CHECK FRONT INNER RIGHT SENSOR SIGNAL CIRCUIT FOR OPEN OR SHORT TO GROUND

1. Turn ignition switch OFF.

2. Disconnect sonar control unit and front sonar sensor RH inner connectors.
3. Check continuity between sonar control unit connector M114 and front sonar sensor RH inner connector E224.

Sonar control unit		Front sonar sensor RH inner		Continuity
Connector	Terminal	Connector	Terminal	
M114	1	E224	2	Yes

4. Check continuity between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Continuity
Connector	Terminal		
M114	1	(–)	No

Is the inspection result normal?

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

2.CHECK FRONT INNER RIGHT SENSOR SIGNAL CIRCUIT FOR SHORT TO VOLTAGE

1. Turn ignition switch ON.
2. Check voltage between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M114	1	(–)	0V

Is the inspection result normal?

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

3.CHECK FRONT SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Check continuity between sonar control unit connector M114 and front sonar sensor RH inner connector E224.

Sonar control unit		Front sonar sensor RH inner		Continuity
Connector	Terminal	Connector	Terminal	
M114	13	E224	1	Yes

Is the inspection result normal?

YES >> Replace front sonar sensor RH inner. Refer to SN-63, "Removal and Installation - Front Sonar Sensors".
NO >> Repair or replace harness or connectors.

B272C CORNER SENSOR [FR]

DTC Description

INFOID:0000000014386770

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	
B272C	Front right side external sensor (Front sonar sensor RH outer)	1	Diagnosis condition	When ignition switch is ON and power supply voltage is 8.5V – 16.5V.
			Signal (terminal)	Front outer right sensor signal (terminal 4)
			Threshold	Front outer right sensor signal circuit is open or short to ground
			Diagnosis delay time	—
		2	Diagnosis condition	When ignition switch is ON and power supply voltage is 8.5V – 16.5V.
			Signal (terminal)	Front outer right sensor signal (terminal 4)
			Threshold	Front outer right sensor signal circuit is short to voltage
			Diagnosis delay time	—
		3	Diagnosis condition	When ignition switch is ON and power supply voltage is 9.5V – 16.5V.
			Signal (terminal)	Front outer right sensor signal (terminal 4)
			Threshold	Front sonar sensor RH outer element malfunction
			Diagnosis delay time	—

POSSIBLE CAUSE

- Harness or connectors
- Front sonar sensor RH outer

FAIL-SAFE

- Obstacle detection of front sonar sensor RH outer is stopped
- Audible warning (front sonar buzzer) of all sensors is stopped
- Front sonar buzzer sounds for 3 seconds

DTC CONFIRMATION PROCEDURE

1.DTC CONFIRMATION PROCEDURE

CONSULT

1. Turn ignition switch ON.
2. Perform “Self Diagnostic Result” mode of “SONAR”.

Is DTC B272C detected?

YES >> Refer to SN-53, "Diagnosis Procedure".
NO–1 >> To check malfunction symptom before repair: Refer to GI-47, "Intermittent Incident".
NO–2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014386771

Regarding Wiring Diagram information, refer to SN-19, "Wiring Diagram".

1.CHECK FRONT OUTER RIGHT SENSOR SIGNAL CIRCUIT FOR OPEN OR SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect sonar control unit and front sonar sensor RH outer connectors.
3. Check continuity between sonar control unit connector M114 and front sonar sensor RH outer connector E222.

Sonar control unit		Front sonar sensor RH outer		Continuity
Connector	Terminal	Connector	Terminal	
M114	4	E222	2	Yes

4. Check continuity between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Continuity
Connector	Terminal		
M114	4	(–)	No

Is the inspection result normal?

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

2.CHECK FRONT OUTER RIGHT SENSOR SIGNAL CIRCUIT FOR SHORT TO VOLTAGE

1. Turn ignition switch ON.
2. Check voltage between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M114	4	(–)	0V

Is the inspection result normal?

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

3.CHECK FRONT SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Check continuity between sonar control unit connector M114 and front sonar sensor RH outer connector E221.

Sonar control unit		Front sonar sensor RH outer		Continuity
Connector	Terminal	Connector	Terminal	
M114	13	E222	1	Yes

Is the inspection result normal?

YES >> Replace front sonar sensor RH outer. Refer to SN-63, "Removal and Installation - Front Sonar Sensors".
NO >> Repair or replace harness or connectors.

B272D FRONT BUZZER

DTC Description

INFOID:0000000014386772

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	
B272D	Front buzzer (Front sonar buzzer)	1	Diagnosis condition	When ignition switch is ON.
			Signal (terminal)	• Speaker power circuit (terminal 19) • Speaker signal (terminal 18)
			Threshold	• Speaker power circuit is open or short to ground • Speaker signal circuit is open or short to ground
			Diagnosis delay time	—
		2	Diagnosis condition	When ignition switch is ON.
			Signal (terminal)	• Speaker power circuit (terminal 19) • Speaker signal (terminal 18)
			Threshold	• Speaker power circuit is short to voltage • Speaker signal circuit is short to voltage
			Diagnosis delay time	—

POSSIBLE CAUSE

- Harness or connectors
- Front sonar buzzer

FAIL-SAFE

- Off indicator blinks periodically (500ms ON, 500ms OFF)
- Audible warning (front sonar buzzer) of all sensors is stopped

DTC CONFIRMATION PROCEDURE

1.DTC CONFIRMATION PROCEDURE

CONSULT

1. Turn ignition switch ON.
2. Perform “Self Diagnostic Result” mode of “SONAR”.

Is DTC B272D detected?

YES >> Refer to SN-55.
NO–1 >> To check malfunction symptom before repair: Refer to GI-47, "Intermittent Incident".
NO–2 >> Confirmation after repair: Inspection End.

Diagnosis Procedure

INFOID:0000000014386773

Regarding Wiring Diagram information, refer to SN-19, "Wiring Diagram".

1.CHECK FRONT SONAR BUZZER SIGNAL CIRCUIT OPEN OR SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect sonar control unit and front sonar buzzer connectors.
3. Check continuity between sonar control unit connector M114 and front sonar buzzer connector M116.

Sonar control unit		Front sonar buzzer		Continuity
Connector	Terminal	Connector	Terminal	

M114	18	M116	3	Yes
	19		2	

4. Check continuity between sonar control unit connector M70 and ground.

Sonar control unit		Ground	Continuity
Connector	Terminal		
M114	18	(–)	No
	19		

Is the inspection result normal?

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

2.CHECK FRONT SONAR BUZZER SIGNAL CIRCUIT SHORT TO BATTERY

1. Turn ignition switch ON.
2. Check voltage between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M114	18	(–)	0V
	19		

Is the inspection result normal?

YES >> Replace front sonar buzzer. Refer to SN-67, "Removal and Installation".
NO >> Repair or replace harness or connectors.

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:0000000014386774

Regarding Wiring Diagram information, refer to SN-19, "Wiring Diagram".

1.CHECK FUSE

Check that the following fuse is not blown:

Terminal No.	Signal name	Fuse No.
12	IGN power supply	29 (5A)

Is the fuse blown?

YES >> Replace the blown fuse after repairing the affected circuit.
NO >> GO TO 2.

2.CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector.
3. Check voltage between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
M114	12	(–)	Ignition switch: ON	Battery voltage

Is the inspection result normal?

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

3.CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Continuity
Connector	Terminal		
M114	15	(–)	Yes

Is the inspection result normal?

YES >> Inspection End.
NO >> Repair or replace harness or connectors.

SONAR SYSTEM OFF SWITCH CIRCUIT

Diagnosis Procedure

INFOID:0000000014386775

Regarding Wiring Diagram information, refer to SN-19, "Wiring Diagram".

WITH DRIVER ASSISTANCE SYSTEM

1.CHECK SONAR SYSTEM OFF SWITCH INPUT CIRCUIT FOR OPEN OR SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect ADAS control unit and sonar system off switch connectors.
3. Check continuity between ADAS control unit connector M128 and sonar system off switch connector M117.

ADAS control unit		Sonar system off switch		Continuity
Connector	Terminal	Connector	Terminal	
M128	11	M117	6	Yes

4. Check continuity between ADAS control unit connector M128 and ground.

ADAS control unit		Ground	Continuity
Connector	Terminal		
M128	11	(–)	No

Is the inspection result normal?

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

2.CHECK SONAR SYSTEM OFF SWITCH INPUT CIRCUIT FOR SHORT TO VOLTAGE

1. Turn ignition switch ON.
2. Check voltage between ADAS control unit connector M128 and ground.

ADAS control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M128	11	(–)	0V

Is the inspection result normal?

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

3.CHECK SONAR SYSTEM OFF SWITCH GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between sonar system off switch connector M117 and ground.

Sonar system off switch		Ground	Continuity
Connector	Terminal		
M117	8	(–)	Yes

Is the inspection result normal?

YES >> Replace sonar system off switch. Refer to IP-20, "Removal and Installation".
NO >> Repair or replace harness or connectors.

WITHOUT DRIVER ASSISTANCE SYSTEM

1.CHECK SONAR SYSTEM OFF SWITCH INPUT CIRCUIT FOR OPEN OR SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect sonar control unit and sonar system off switch connectors.
3. Check continuity between sonar control unit connector M114 and sonar system off switch connector M117.

Sonar control unit		Sonar system off switch		Continuity
Connector	Terminal	Connector	Terminal	
M114	16	M117	6	Yes

4. Check continuity between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Continuity
Connector	Terminal		
M114	16	(–)	No

Is the inspection result normal?

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

2.CHECK SONAR SYSTEM OFF SWITCH INPUT CIRCUIT FOR SHORT TO VOLTAGE

1. Turn ignition switch ON.
2. Check voltage between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Voltage (Approx.)
Connector	Terminal		
M114	16	(–)	0V

Is the inspection result normal?

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

3.CHECK SONAR SYSTEM OFF SWITCH GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between sonar system off switch connector M117 and ground.

Sonar system off switch		Ground	Continuity
Connector	Terminal		
M117	8	(–)	Yes

Is the inspection result normal?

YES >> Replace sonar system off switch. Refer to IP-20, "Removal and Installation".
NO >> Repair or replace harness or connectors.

SONAR SYSTEM OFF SWITCH INDICATOR LAMP CIRCUIT

Diagnosis Procedure

INFOID:0000000014386776

Regarding Wiring Diagram information, refer to SN-19, "Wiring Diagram".

WITH DRIVER ASSISTANCE SYSTEM

1.CHECK SONAR SYSTEM OFF SWITCH INDICATOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect sonar system off switch connector.
3. Turn ignition switch ON.
4. Check voltage between sonar system off switch connector M117 and ground.

Sonar system off switch		Ground	Voltage (Approx.)
Connector	Terminal		
M117	5	(–)	Battery voltage

Is the inspection result normal?

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

2.CHECK SONAR SYSTEM OFF SWITCH INDICATOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ADAS control unit connector.
3. Check continuity between ADAS control unit connector M128 and sonar system off switch connector M117.

ADAS control unit		Sonar system off switch		Continuity
Connector	Terminal	Connector	Terminal	
M128	17	M117	3	Yes

Is the inspection result normal?

YES >> Replace sonar system off switch. Refer to IP-20, "Removal and Installation".
NO >> Repair or replace harness or connectors.

WITHOUT DRIVER ASSISTANCE SYSTEM

1.CHECK SONAR SYSTEM OFF SWITCH INDICATOR CIRCUIT FOR OPEN OR SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect sonar control unit and sonar system off switch connectors.
3. Check continuity between sonar control unit connector M114 and sonar system off switch connector M117.

Sonar control unit		Sonar system off switch		Continuity
Connector	Terminal	Connector	Terminal	
M114	17	M117	5	Yes

4. Check continuity between sonar control unit connector M114 and ground.

Sonar control unit		Ground	Continuity
Connector	Terminal		
M114	17	(–)	No

Is the inspection result normal?

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

2. CHECK SONAR SYSTEM OFF SWITCH INDICATOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between sonar system off switch connector M117 and ground.

Sonar system off switch		Ground	Continuity
Connector	Terminal		
M117	3	(–)	Yes

Is the inspection result normal?

YES >> Replace sonar system off switch. Refer to IP-20, "Removal and Installation".
NO >> Repair or replace harness or connectors.

SYMPTOM DIAGNOSIS

SONAR SYSTEM

Symptom Table

INFOID:0000000014386777

NOTE:
If the front license plate is bent and not laying flat against the bumper, it can cause a false warning from the sonar system. Before performing diagnosis for a false warning, ensure that the front license plate is laying flat against the bumper and no other obstructions are within the detection range of the sonar sensors.

Symptom	Possible cause	Reference page
Malfunction is detected in only 1 sensor of display (Always displayed in red).	• Sonar sensor circuit • Sonar sensor • Sonar sensor obstruction	• SN-47 (front sonar sensor LH outer) SN-49 (front sonar sensor LH inner) SN-51 (front sonar sensor RH inner) SN-53 (front sonar sensor RH outer) SN-36 (rear sonar sensor LH outer) SN-38 (rear sonar sensor LH inner) SN-40 (rear sonar sensor RH inner) SN-42 (rear sonar sensor RH outer) • SN-63 (removal and installation - front sonar sensors) SN-64 (removal and installation - rear sonar sensors) • Front license plate (if equipped) is bent and obstructing the sensor area.
Malfunction is detected in all 4 front sensors of display (Always displayed in red).	Sonar sensors ground circuit	SN-47 (front sonar sensor LH outer) SN-49 (front sonar sensor LH inner) SN-51 (front sonar sensor RH inner) SN-53 (front sonar sensor RH outer)
Malfunction is detected in all 4 rear sensors of display (Always displayed in red).	Sonar sensors ground circuit	SN-36 (rear sonar sensor LH outer) SN-38 (rear sonar sensor LH inner) SN-40 (rear sonar sensor RH inner) SN-42 (rear sonar sensor RH outer)
Malfunction is detected in all 8 sensors of display (Always displayed in red).	• Sonar control unit power supply and ground circuits • CAN communication circuits	• SN-57 • LAN-53

REMOVAL AND INSTALLATION

SONAR SENSOR

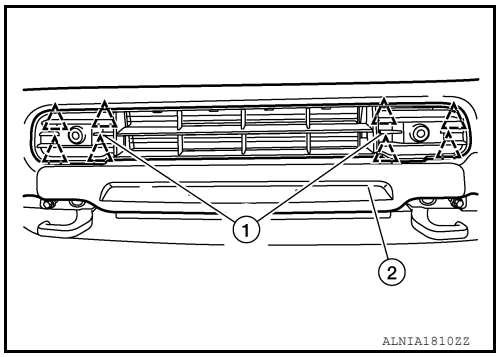
Removal and Installation - Front Sonar Sensors

INFOID:0000000014386778

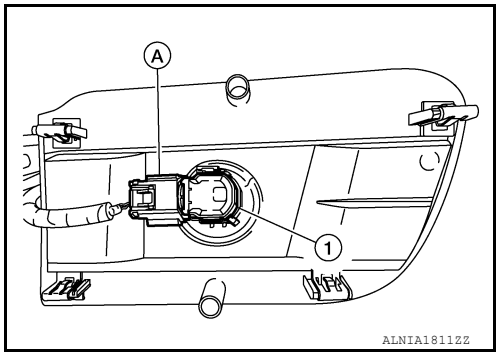
REMOVAL (Inner Sensors)

1. Release clips using suitable tool and remove front bumper grill finisher [LH/RH (1)] from front bumper (2).

: Clip

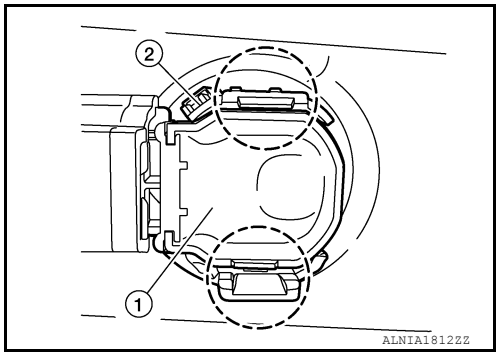


2. Disconnect the harness connector (A) from the front sonar inner sensor (1).



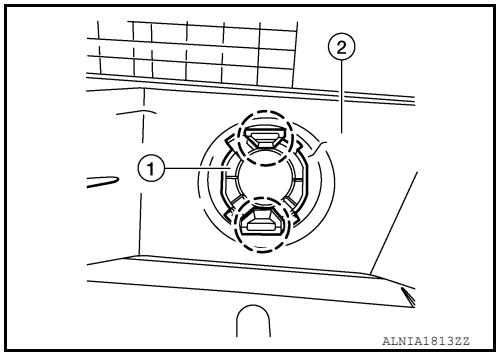
3. Release pawls using suitable tool and remove front sonar inner sensor (1) from sonar finisher (2).

: Pawl



4. Squeeze pawls and remove front sonar sensor finisher (1) from front bumper grill finisher [2 (if necessary)].

: Pawl

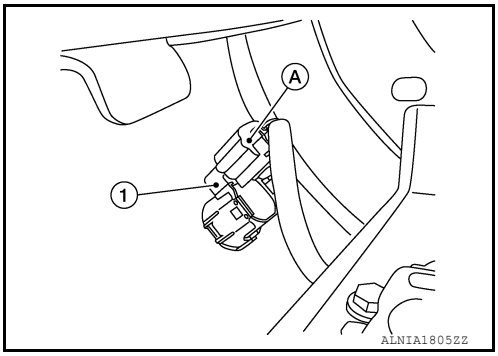


INSTALLATION

Installation is in the reverse order of removal.

REMOVAL (Outer Sensors)

1. Disconnect the harness connector (A) from the front sonar outer sensor (1).

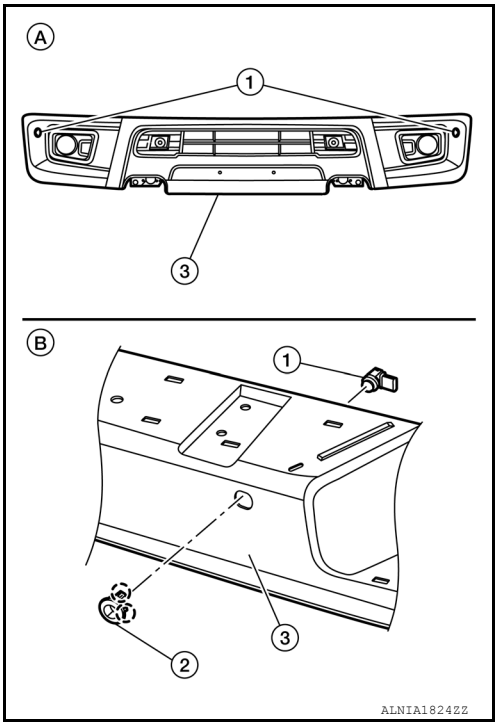


2. Release pawls using suitable tool and remove front sonar outer sensor (1) from front sonar sensor finisher (2).

   : Pawl

3. Squeeze pawls and remove front sonar sensor finisher from front bumper (3).

   : Pawl
   (A) : Front bumper shown
   (B) : Rear bumper shown (front similar)



INSTALLATION

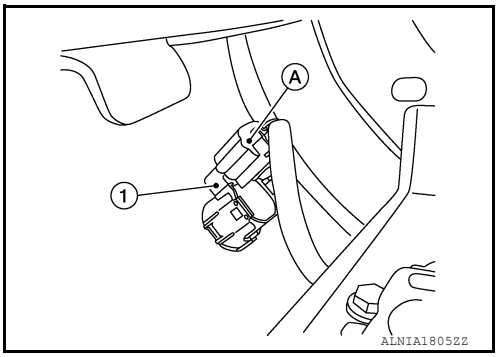
Installation is in the reverse order of removal.

Removal and Installation - Rear Sonar Sensors

INFOID:0000000014386779

REMOVAL

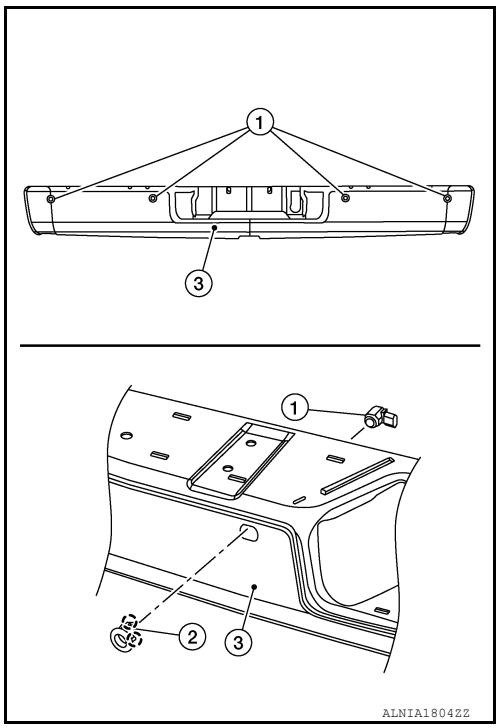
1. Disconnect the harness connector (A) from the rear sonar sensor (1).



2. Release rear sonar sensor finisher (2) pawls using suitable tool and remove rear sonar sensor (1) from rear sonar sensor finisher.

: Pawl

3. Remove rear sonar sensor finisher from rear bumper (3) (if necessary).



INSTALLATION

Installation is in the reverse order of removal.

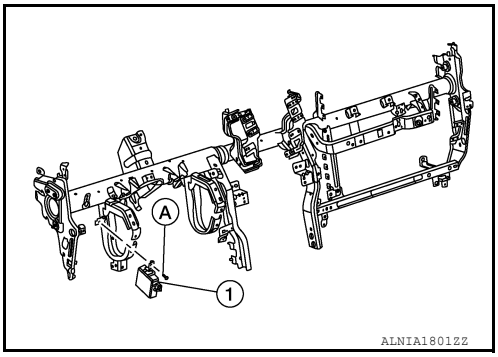
SONAR CONTROL UNIT

Removal and Installation

INFOID:0000000014386780

REMOVAL

1. Remove Instrument lower panel LH. Refer to IP-22, "Removal and Installation".
2. Disconnect the harness connector from the sonar control unit (1).
3. Remove screw (A) and remove sonar control unit.



INSTALLATION

Installation is in the reverse order of removal.

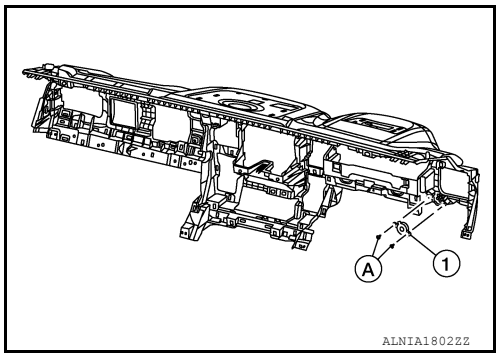
BUZZER

Removal and Installation

INFOID:0000000014386781

REMOVAL

1. Remove instrument panel lower LH. Refer to IP-22, "Removal and Installation".
2. Remove center console. Refer to IP-24, "Removal and Installation".
3. Disconnect the harness connector from the front sonar buzzer (1).
4. Remove screws (A) from front sonar buzzer and remove.



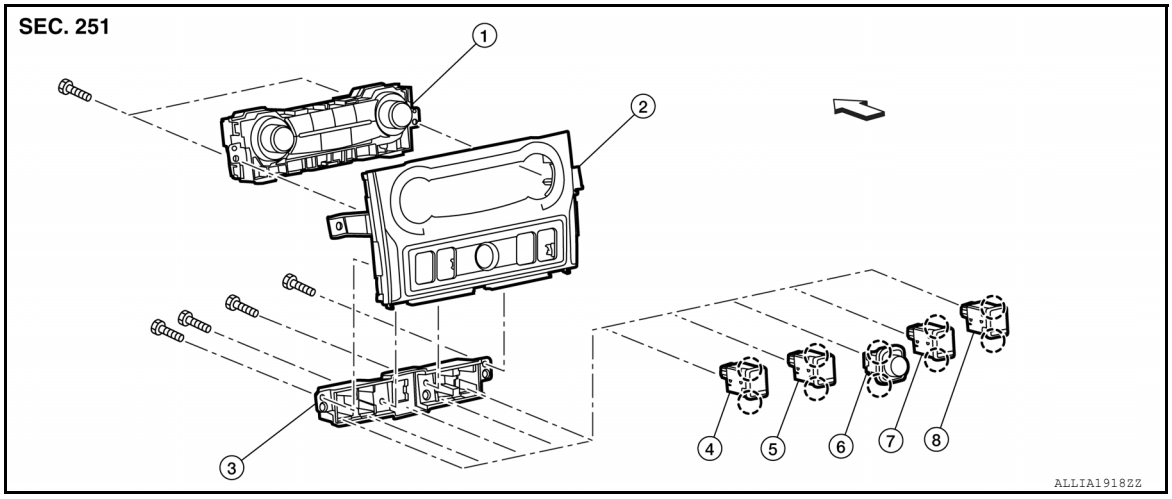
INSTALLATION

Installation is in the reverse order of removal.

SONAR SYSTEM OFF SWITCH

Exploded View

INFOID:0000000014386782



1. A/C switch assembly
2. Cluster lid C
3. Switch carrier
4. VDC OFF switch
5. Sonar system off switch
6. Hazard switch
7. Blind spot warning switch (if equipped)
8. Heated steering wheel switch (if equipped)

⇦ Front

Removal and Installation

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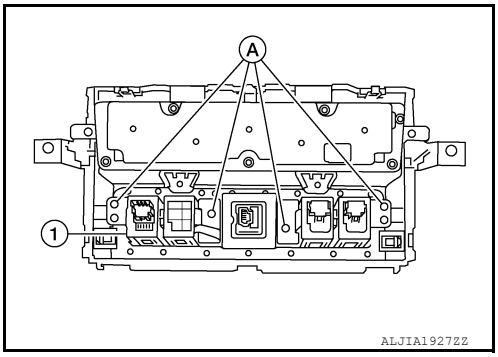
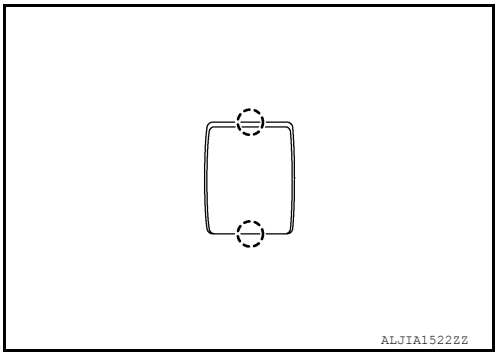
REMOVAL

1. Remove cluster lid C. Refer to IP-20, "Removal and Installation".
2. Remove screws (A) and switch carrier (1) from cluster lid C.



3. Release pawls using suitable tool and remove sonar system off switch from switch carrier.



: Pawl

INSTALLATION

Installation is in the reverse order of removal.