SECTION SN
SONAR SYSTEM

CONTENTS

PREPARATION 3

PREPARATION 3
Commercial Service Tool 3

BASIC INSPECTION 4

DIAGNOSIS AND REPAIR WORKFLOW 4
Work Flow 4

INSPECTION AND ADJUSTMENT 6
Preliminary Check 6

SYSTEM DESCRIPTION 7

REAR ONLY SONAR SYSTEM 7
System Diagram 7
System Description 7
Component Parts Location 8
Component Description 8
Self-Diagnosis Function 8

FRONT AND REAR SONAR SYSTEM 11
System Diagram 11
System Description 11
Component Parts Location 12
Component Description 13
CONSULT-III Function (SONAR) 13

DTC/CIRCUIT DIAGNOSIS 15

POWER SUPPLY AND GROUND CIRCUIT 15
Diagnosis Procedure (With Rear Only Sonar System) 15
Diagnosis Procedure (With Front and Rear Sonar System) 15

SONAR SENSOR CIRCUIT INSPECTION 17
Description 17
Component Function Check (With Front and Rear Sonar System) 17
Diagnosis Procedure (With Rear Only Sonar System) 17
Diagnosis Procedure (With Front and Rear Sonar System) 17
Component Inspection (With Front and Rear Sonar System) 18

SONAR BUZZER CIRCUIT INSPECTION 20
Description 20
Component Function Check (With Front and Rear Sonar System) 20
Diagnosis Procedure (With Rear Only Sonar System) 20
Diagnosis Procedure (With Front and Rear Sonar System) 21
Component Inspection 21

SONAR SYSTEM OFF SWITCH CIRCUIT INSPECTION 22
Description 22
Component Function Check (With Front and Rear Sonar System) 22
Diagnosis Procedure (With Rear Only Sonar System) 22
Diagnosis Procedure (With Front and Rear Sonar System) 23
Component Inspection 24

ECU DIAGNOSIS INFORMATION 25

SONAR CONTROL UNIT FOR REAR ONLY SONAR SYSTEM 25
Reference Value 25
DTC Index 26

SONAR CONTROL UNIT FOR FRONT AND REAR SONAR SYSTEM 27
Reference Value 27
DTC Index 28

WIRING DIAGRAM 30

SONAR SYSTEM 30
Wiring Diagram - Rear 30
Wiring Diagram - Front And Rear 37

SYMPTOM DIAGNOSIS 48

SONAR SYSTEM SYMPTOMS 48
Symptom Table 48

PRECAUTION 50

PRECAUTION 50
Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" 50
Precaution Necessary for Steering Wheel Rotation After Battery Disconnect 50

UNIT REMOVAL AND INSTALLATION 52

SONAR SENSOR 52
Removal and Installation 52

SONAR CONTROL UNIT 53
Removal and Installation 53

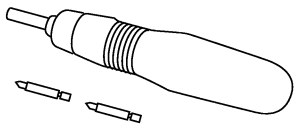
BUZZER 54
Removal and Installation 54

PREPARATION

PREPARATION

Commercial Service Tool

INFOID:0000000006146787

Tool name	Description
Power tool  PBIC0191E	Loosening bolts and nuts.

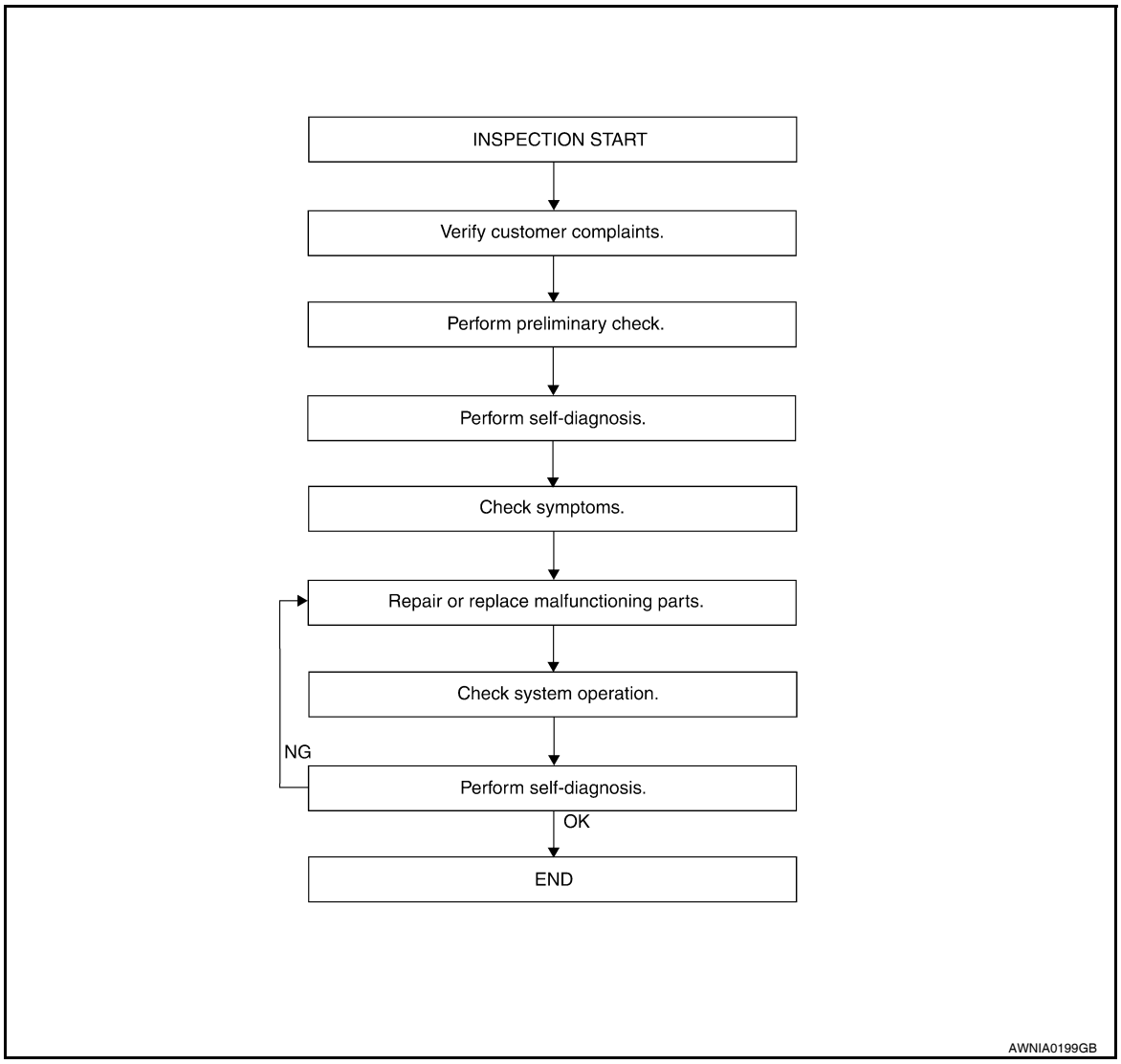
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000006146788

WORK FLOW



DETAILED FLOW

1.CUSTOMER INFORMATION

Interview the customer to obtain detailed information about the symptom.

>> GO TO 2

2.PRELIMINARY CHECK

Perform preliminary check. Refer to SN-6, "Preliminary Check".

>> GO TO 3

3.SELF-DIAGNOSIS

Perform self-diagnosis. Refer to SN-8, "Self-Diagnosis Function" (with rear only sonar system) or SN-13, "CONSULT-III Function (SONAR)" (with front and rear sonar system).

>> GO TO 4

4.SYMPTOM

Check for symptoms. Refer to SN-48, "Symptom Table".

>> GO TO 5

5.MALFUNCTIONING PARTS

Repair or replace the applicable parts.

>> GO TO 6

6.SYSTEM OPERATION

Check system operation. Refer to SN-6, "Preliminary Check".

>> GO TO 7

7.SELF-DIAGNOSIS

Perform self-diagnosis. Refer to SN-8, "Self-Diagnosis Function" (with rear only sonar system) or SN-13, "CONSULT-III Function (SONAR)" (with front and rear sonar system).

Are any fault codes displayed?

YES >> GO TO 5
NO >> Inspection End.

INSPECTION AND ADJUSTMENT

Preliminary Check

INFOID:0000000006146789

DESCRIPTION

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

CONDITIONS

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

SONAR SENSOR STATUS CHECK

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

CAUTION:

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

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

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

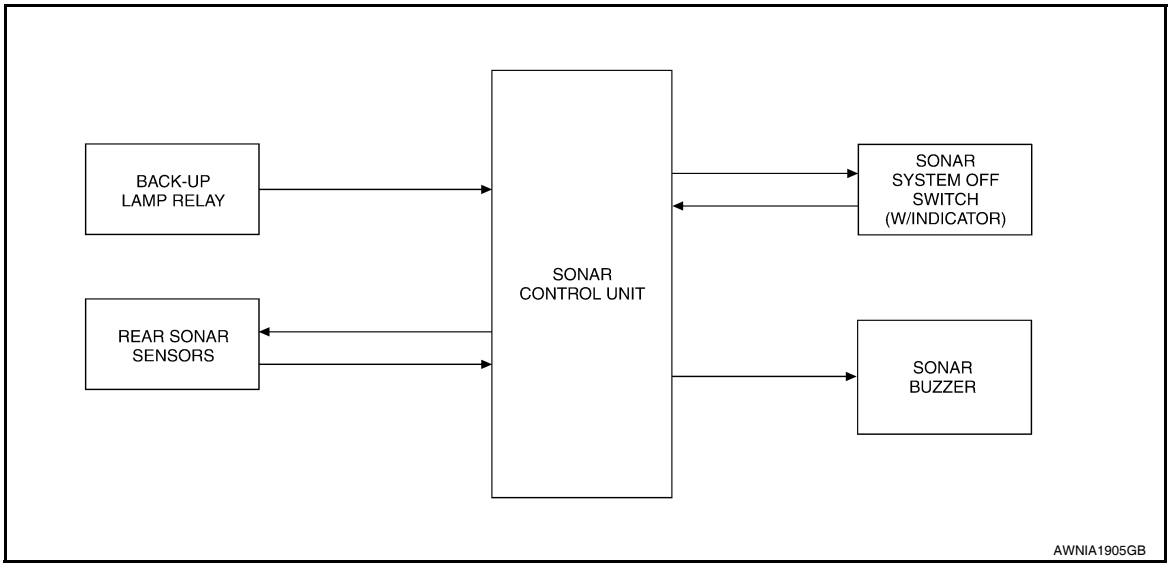
3. Check that there are no nearby ultrasound sources such as the sounds of vehicle horns, motorcycle engines or truck air brakes.
4. Check that the vehicle is on a level surface.

SYSTEM DESCRIPTION

REAR ONLY SONAR SYSTEM

System Diagram

INFOID:0000000006146790



System Description

INFOID:0000000006146791

FUNCTION

With power and ground supplied, transmission gear selector lever in R position, and the sonar system OFF switch ON, the rear sonar system will detect obstacles within 1.8 m (5.9 ft.) of the rear sonar sensors. The vehicle operator is notified of obstacles by varied rate of tone from the sonar buzzer depending on distance of obstacle being sensed.

SONAR SYSTEM OFF SWITCH

With power and ground supplied to the sonar control unit, transmission gear selector lever in R position, the sonar system can be disabled and the sonar buzzer silenced by momentarily pressing the sonar system OFF switch. The sonar system OFF indicator lamp will be illuminated in the sonar system OFF switch.
The rear sonar system and buzzer will be disabled and the sonar system OFF indicator will be illuminated until the ignition switch is turned OFF. When the ignition switch is turned ON, the rear sonar system will be enabled. Depressing the sonar system OFF switch again will enable the rear sonar system also. Enabling the rear sonar system will cause the sonar system OFF indicator to go out. If the sonar control unit detects a malfunction in the system it will turn off the sonar system and the indicator lamp will turn on.

SONAR BUZZER

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

REAR SONAR SENSORS

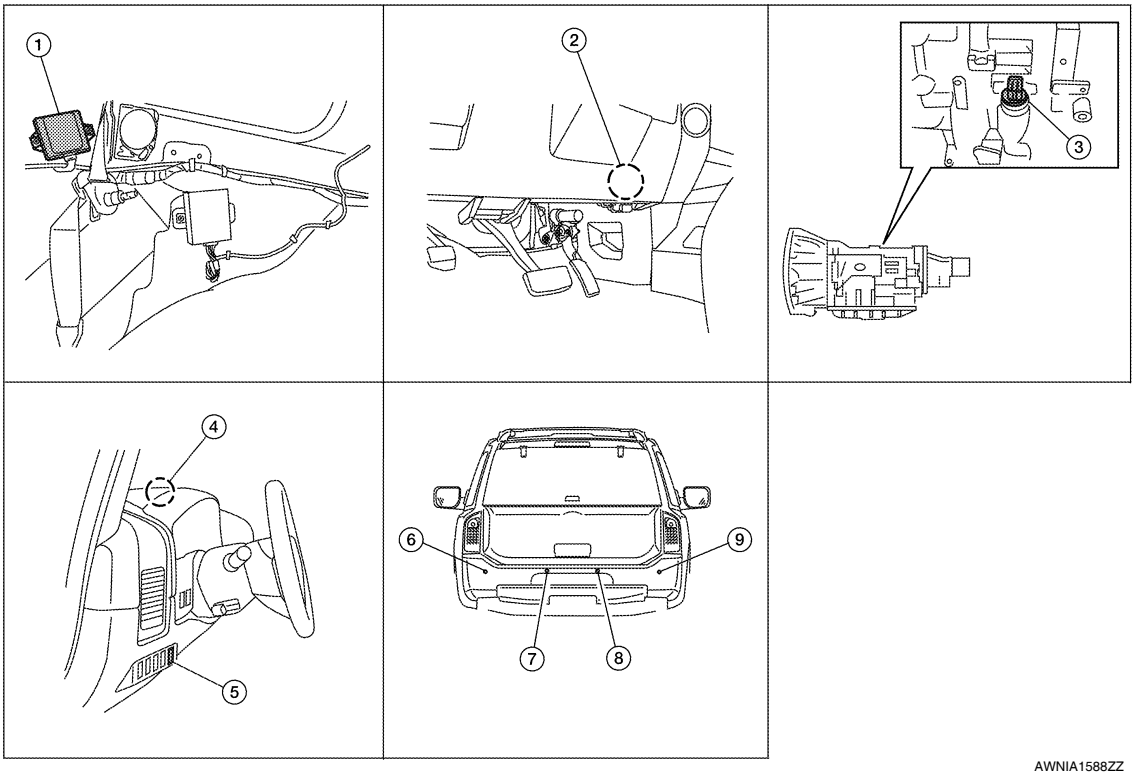
With power and ground supplied to the rear sonar sensors, the sonar sensors transmit an ultrasonic signal. This signal is reflected back to the sensor by objects large enough and close enough to be detected. The rear sonar sensors measure the time from the transmitted signal to the time the signal is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

BACK-UP LAMP RELAY

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

Component Parts Location

INFOID:0000000006146792



AWNIA1588ZZ

1. Sonar control unit B24 (view with luggage side finisher LH removed)
2. Back-up lamp relay M73
3. A/T assembly F9
4. Sonar buzzer M47
5. Sonar system OFF switch M116 (with sonar system OFF indicator)
6. Rear sonar sensor LH outer C102
7. Rear sonar sensor LH inner C103
8. Rear sonar sensor RH inner C104
9. Rear sonar sensor RH outer C105

Component Description

INFOID:0000000006146793

Component	Function
Sonar control unit	Controls sonar system and provides self-diagnosis
Back-up lamp relay	Provides reverse signal for sonar control unit
A/T assembly	Controls back-up lamp relay
Sonar buzzer	Sounds a signal when objects are detected in the rear of the vehicle
Sonar system OFF switch	Enables the driver to turn system off and signals a system malfunction
Sonar sensor	Senses objects in the rear of the vehicle

Self-Diagnosis Function

INFOID:0000000006146794

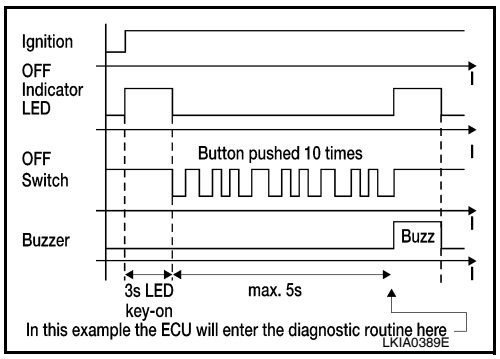
NOTE:
Always perform Preliminary Check before running Self-Diagnosis Function. Refer to SN-6, "Preliminary Check".

There are four modes of self-diagnosis. These modes must be followed in the following order:
1. Entering diagnostics mode
2. Requesting number of fault codes mode
3. Requesting fault codes mode
4. Clearing fault codes mode

Self-diagnosis can be manually exited by turning the ignition OFF or selecting reverse gear. Self-diagnosis will exit unless a fault code request occurs before a message is repeated five times without acknowledgement.

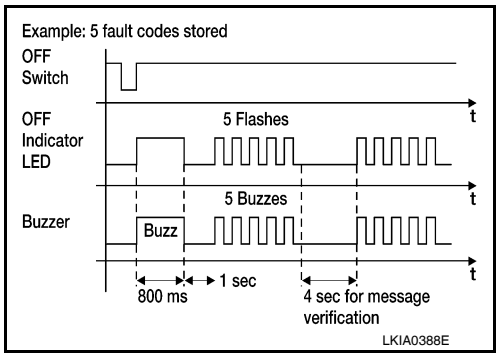
ENTERING DIAGNOSTICS MODE

1. Turn ignition switch ON. Sonar system OFF switch indicator lamp illuminates for three seconds and then turns off.
2. Immediately push sonar system OFF switch ten times within five seconds.
3. The sonar buzzer will sound once and the sonar system OFF indicator will flash once.



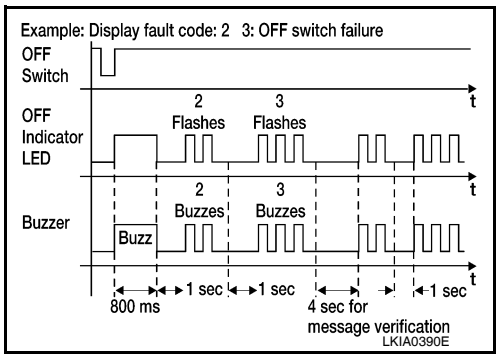
REQUESTING NUMBER OF FAULT CODES MODE

1. While in "entering diagnostic mode", push sonar system OFF switch once within 30 seconds of entering diagnostic mode.
   NOTE:
   If the number of fault codes is not requested within 30 seconds after entering diagnostic mode, the system will return to regular operation mode.
2. The sonar buzzer will sound once.
3. Sonar system OFF indicator will flash once and sonar buzzer will sound once for each fault code detected.
4. There will be a four second pause.
5. The number of fault codes will repeat five times then pause.
   NOTE:
   Self-diagnosis will exit unless "requesting fault codes mode" occurs before five repeats ends.



REQUESTING FAULT CODES MODE

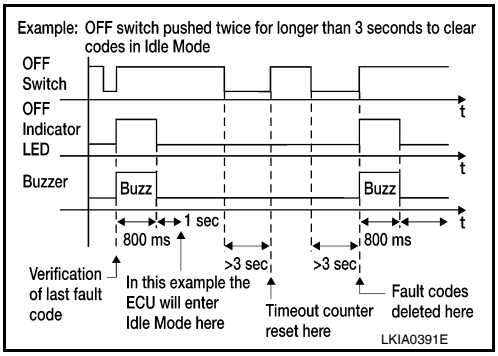
1. While in "requesting number of fault codes" mode, push sonar system OFF switch once.
2. The sonar buzzer will sound once.
3. Sonar system OFF indicator will flash and sonar buzzer will sound the first digit of the fault code followed by a one second pause.
4. Sonar system OFF indicator will flash and sonar buzzer will sound the second digit of the fault code followed by a four second pause.
5. Each fault code will repeat five times then pause.
6. Write down each fault code. Then, acknowledge the fault code by pushing the sonar system OFF switch once (the sonar buzzer may sound).
   NOTE:
   "Requesting fault codes mode" will exit unless the fault code is acknowledged before it is repeated five times. When all fault codes have been indicated, "clearing fault codes mode" will be entered. Refer to SN-26, "DTC Index".



CLEARING FAULT CODES MODE

NOTE:
While in "clearing fault codes mode", self-diagnosis will automatically exit if no activity occurs for 30 seconds.

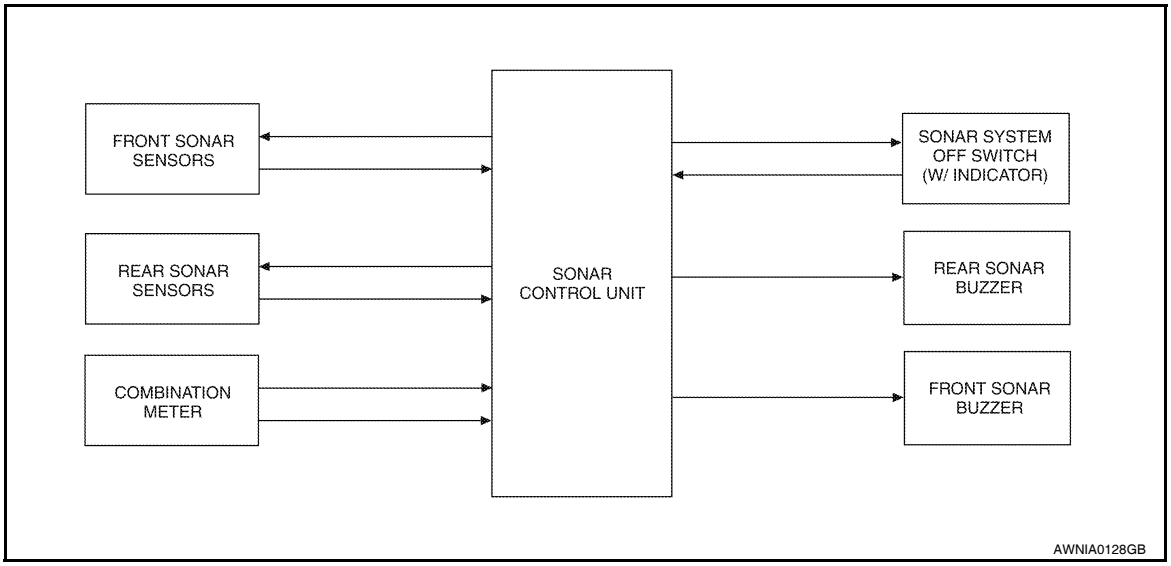
1. Push and hold sonar system OFF switch for three seconds to reset time-out counter.
2. Push and hold sonar system OFF switch for three seconds to clear codes.



FRONT AND REAR SONAR SYSTEM

System Diagram

INFOID:0000000006146795



System Description

INFOID:0000000006607908

FUNCTION

FUNCTION WHILE MOVING IN REVERSE

With power and ground supplied, transmission gear selector lever in R position, and the sonar system OFF switch ON, the sonar system will detect obstacles within 1.8 m (5.9 ft.) of the rear sonar sensors and within 0.5 m (1.64 ft.) of the two outer front sonar sensors. The vehicle operator is notified of obstacles by varied rate of tone from the rear or front sonar buzzers depending on location and distance of obstacle being sensed. If the vehicle speed reaches 50 km/h (31 MPH) in reverse the sonar system will shut down.

FUNCTION WHILE MOVING FORWARD

With power and ground supplied, transmission gear selector lever in a forward drive gear, and the sonar system OFF switch ON, the front sonar system will detect obstacles within 1.0 m (3 ft.) of the front sonar sensors. The vehicle operator is notified of obstacles by varied rate of tone from the front sonar buzzer depending on distance of obstacle being sensed. When the vehicle accelerates to 12 km/h (7.5 MPH) the sonar system will shut down. When the vehicle decelerates to 8 km/h (5 MPH) the sonar system will turn back on.

SONAR SYSTEM OFF SWITCH

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

SONAR BUZZERS

FUNCTION WHILE MOVING IN REVERSE

With power and ground supplied to the sonar control unit and the A/T selector lever in R position, a stationary object that is at least 9.0 cm (3.5 in.) wide and that is closer than 1.8 m (5.9 ft.) will be detected by the rear sonar sensors, causing the rear sonar buzzer to sound a tone. The two outer front sonar sensors will detect same size objects that are closer than 0.5 m (1.64 ft.) causing the front sonar buzzer to sound a tone. As the vehicle moves closer to the object, the rate of the tone will increase. When the object is less than 25.0 cm (10 in.) from the rear or front bumper, the tone will sound continuously. Once the object starts moving away from the front outer sensors, the buzzer tone will stop even if the object is within 1.0 m (3.28 ft.).

FUNCTION WHILE MOVING FORWARD

With power and ground supplied to the sonar control unit and the A/T selector lever in a forward drive gear, a stationary object that is at least 9.0 cm (3.5 in.) wide and that is closer than 1.0 m (3 ft.) will be detected by the front sonar sensors, causing the front sonar buzzer to sound a tone. As the vehicle moves closer to the object, the rate of the tone will increase. When the object is less than 30 cm (12 in.) from the front bumper, the tone will sound continuously.

REAR SONAR SENSORS

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

FRONT SONAR SENSORS

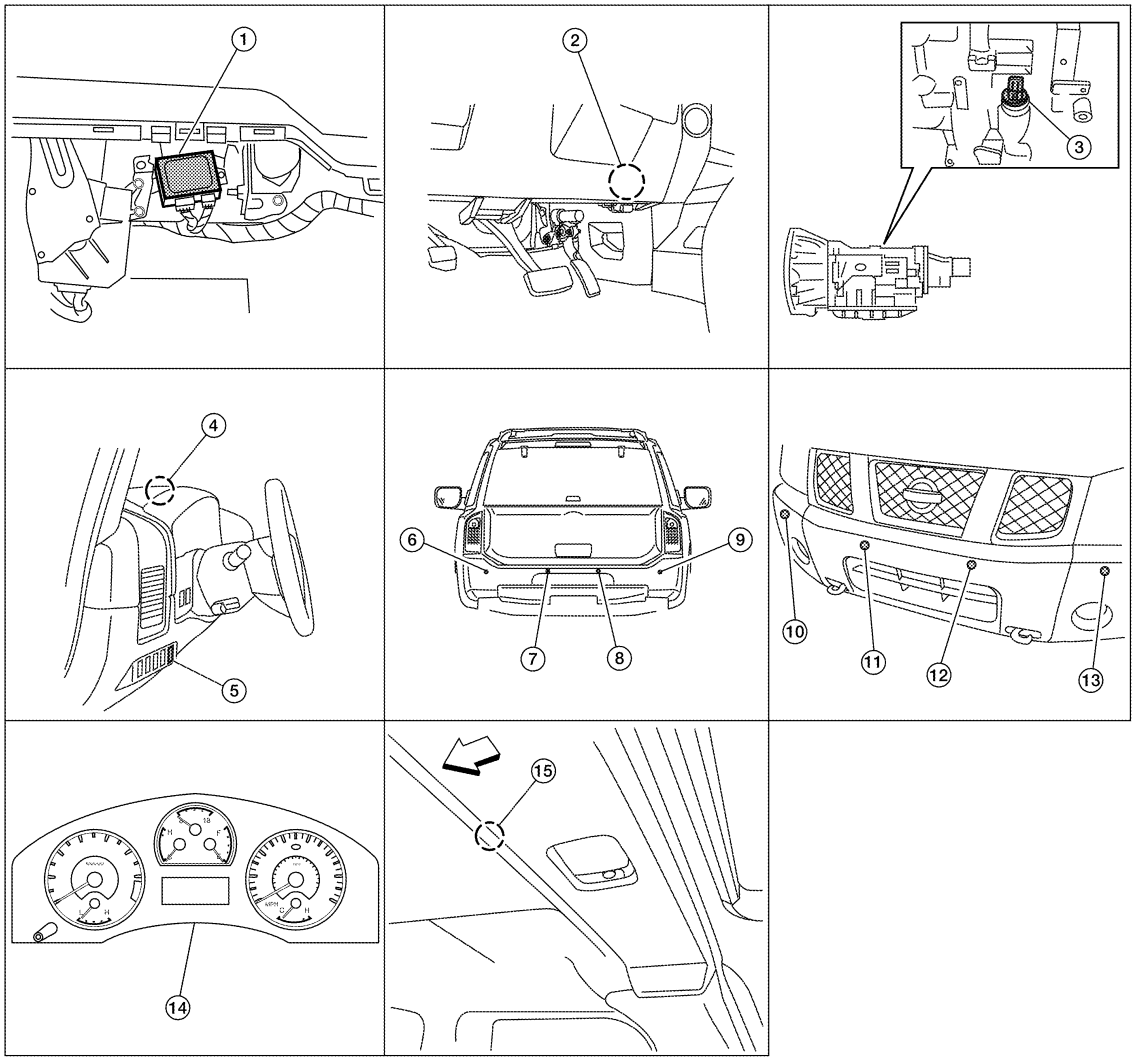
With power and ground supplied to the front sonar sensors, the sonar sensors transmit an ultrasonic signal. This signal is reflected back to the sensor by objects large enough and close enough to be detected. The front sonar sensors send information to the sonar control unit that represents the time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

COMBINATION METER

The combination meter provides the vehicle speed and park signals to the sonar control unit.

Component Parts Location

INFOID:0000000006146797



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⇦ Front

1. Sonar control unit B56, B57 (View with luggage side finisher LH removed)
2. Back-up lamp relay M73
3. A/T assembly F9
4. Front sonar buzzer M118
5. Sonar system OFF switch M116 (with sonar system OFF indicator)
6. Rear sonar sensor LH outer C102
7. Rear sonar sensor LH inner C103
8. Rear sonar sensor RH inner C104
9. Rear sonar sensor RH outer C105
10. Front sonar sensor RH outer E166
11. Front sonar sensor RH inner E163
12. Front sonar sensor LH inner E162
13. Front sonar sensor LH outer E158
14. Combination meter M24
15. Rear sonar buzzer B166 (View with back door open)

Component Description

INFOID:0000000006146798

Component	Function
Sonar control unit	Controls sonar system and provides self-diagnosis
Back-up lamp relay	Provides reverse signal for sonar control unit
A/T assembly	Controls back-up lamp relay
Front sonar buzzer	Sounds a signal when objects are detected in the front of the vehicle
Rear sonar buzzer	Sounds a signal when objects are detected in the rear of the vehicle
Sonar system OFF switch	Enables the driver to turn the system off and signals a system malfunction
Front sonar sensors	Senses objects in the front of the vehicle
Rear sonar sensors	Senses objects in the rear of the vehicle
Combination meter	Provides Park and vehicle speed signals for sonar control unit

CONSULT-III Function (SONAR)

INFOID:0000000006607909

APPLICATION ITEM

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

Diagnosis mode	Description
Ecu Identification	Displays sonar control unit part number.
Self Diagnostic Results	Displays sonar control unit self-diagnosis results.
Data Monitor	Displays sonar control unit input/output data in real time.
Active Test	Sonar control unit can provide a drive signal to components to check their operation.

SELF DIAGNOSTIC PROCEDURE

NOTE:

Always perform Preliminary Check before running Self-Diagnostic Procedure. Refer to SN-6, "Preliminary Check".

CONSULT-III can be used to read and clear DTCs. Refer to GI-46, "Description".

ECU IDENTIFICATION

Displays the part number of the sonar control unit.

SELF DIAGNOSTIC RESULTS

Refer to SN-28, "DTC Index".

DATA MONITOR

Monitor Item	Display	Description
FRONT BUZZER	On	Front sonar buzzer ON.
	Off	Front sonar buzzer OFF.

Monitor Item	Display	Description
REAR BUZZER	On	Rear sonar buzzer ON.
	Off	Rear sonar buzzer OFF.
P RANGE	On	Shift selector is in park.
	Off	Shift selector is not in park.
REVERSE RANGE	On	Shift selector is in reverse.
	Off	Shift selector is not in reverse.
CANCEL SW	On	Sonar system OFF switch ON (sonar system is OFF).
	Off	Sonar system OFF switch OFF (sonar system is ON).
CANCEL SW IND	On	Sonar system OFF switch indicator lamp is ON.
	Off	Sonar system OFF switch indicator lamp is OFF.
VHCL SPE COND	On	Sonar control unit vehicle speed condition meets specifications for sonar system operation.
	Off	Sonar control unit vehicle speed condition does not meet specifications for sonar system operation (vehicle speed to high).
CR SEN [FL] CR SEN [FR] CR SEN [RL] CR SEN [RR]	ERROR	"ERROR" is displayed under the following conditions: • sensor is not detecting an obstacle • sensor is malfunctioning • sensor is disconnected • sensor circuit is open
	LV.2	The distance between the corner sensor and an obstacle is 30 cm (11.8 in) or more and less then 50 cm (19.6 in).
	LV.3	The distance between the corner sensor and an obstacle is less then 30 cm (11.8 in).
CTR SEN [RL] CTR SEN [RR] CTR SEN [FL] CTR SEN [FR]	ERROR	"ERROR" is displayed under the following conditions: • sensor is not detecting an obstacle • sensor is malfunctioning • sensor is disconnected • sensor circuit is open
	LV.0	The distance between the center sensor and an obstacle is more then 100 cm (39.3 in).
	LV.1	The distance between the center sensor and an obstacle is 60 cm (23.6 in) or more and less then 100 cm (39.3 in).
	LV.2	The distance between the center sensor and an obstacle is 50 cm (19.6 in) or more and less then 60 cm (23.6 in).
	LV.3	The distance between the center sensor and an obstacle is 30 cm (11.8 in) or more and less then 60 cm (19.6 in).
	LV.4	The distance between center sensor and an obstacle less than 30 cm (11.8 in).

ACTIVE TEST

Active test item	Operation	Function
BUZZER	FRONT ON	Sonar control unit operates the front sonar buzzer.
	REAR ON	Sonar control unit operates the rear sonar buzzer.
	STOP	Sonar control unit turns all sonar buzzers OFF.
CANSEL SW IND	ON	Sonar control unit turns the sonar system OFF switch indicator ON.
	OFF	Sonar control unit turns the sonar system OFF switch indicator OFF.
SONAR SENSOR	REAR ON	Sonar control unit turns the rear sonar sensors ON.
	FRONT ON	Sonar control unit turns the front sonar sensors ON.
	STOP	Sonar control unit turns all sonar sensors OFF.

DTC/CIRCUIT DIAGNOSIS

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure (With Rear Only Sonar System)

INFOID:0000000006146800

INSPECTION FOR POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES

Check for blown rear sonar system fuses.

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

Are any fuses blown?

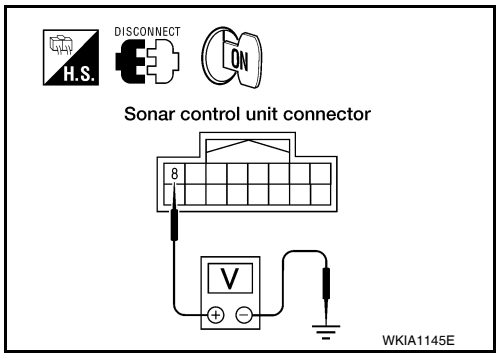
YES >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to GI-41, "Circuit Inspection".

NO >> GO TO 2.

2. CHECK POWER SUPPLY CIRCUIT

1. Disconnect sonar control unit connector.
2. Turn ignition switch ON.
3. Check voltage between sonar control unit connector B24 terminal 8 and ground.

Terminals			Ignition switch position
(+)		(-)	ON or START
Connector	Terminal		
B24	8	Ground	Battery voltage



Is there battery voltage?

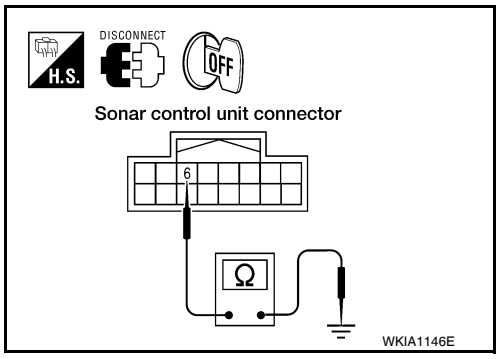
YES >> GO TO 3.

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

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between sonar control unit B24 terminal 6 and ground.

Terminals			Continuity
(+)		(–)	
Connector	Terminal		
B24	6	Ground	Yes



Is there continuity?

YES >> Inspection End.

NO >> Check harness ground circuit.

Diagnosis Procedure (With Front and Rear Sonar System)

INFOID:0000000006146801

INSPECTION FOR POWER SUPPLY AND GROUND CIRCUIT

1. CHECK FUSES

Check for blown sonar system fuses.

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

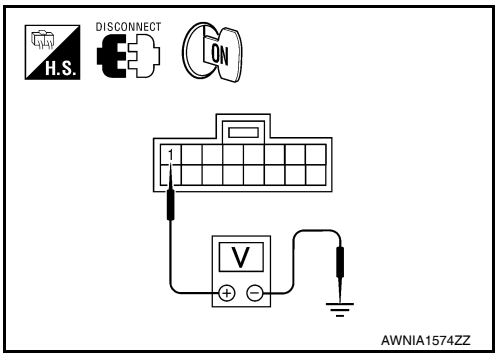
Are any fuses blown?

YES >> If fuse is blown, be sure to eliminate cause of malfunction before installing new fuse. Refer to GI-41, "Circuit Inspection".

NO >> GO TO 2.

2.CHECK POWER SUPPLY CIRCUIT

1. Disconnect sonar control unit connector B56.
2. Turn ignition switch ON.
3. Check voltage between sonar control unit connector B56 terminal 1 and ground.



Terminals			Voltage
(+)		(-)	
Connector	Terminal		
B56	1	Ground	Battery voltage

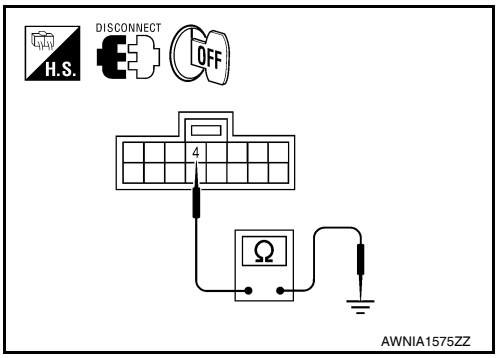
Is there battery voltage?

YES >> GO TO 3.

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

3.CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between sonar control unit B56 terminal 4 and ground.



Terminals			Continuity
(+)		(–)	
Connector	Terminal		
B56	4	Ground	Yes

Is there continuity?

YES >> Inspection End.

NO >> Check harness ground circuit.

SONAR SENSOR CIRCUIT INSPECTION

Description

INFOID:0000000006146802

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

Component Function Check (With Front and Rear Sonar System)

INFOID:0000000006607923

1. CHECK FUNCTION

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

Test Item	CONSULT-III	Description
SONAR SENSOR	REAR ON	All rear sonar sensors ON and rear sonar buzzer sounds
	FRONT ON	All front sonar sensors ON and front sonar buzzer sounds
	STOP	Sensors OFF

Is the operation normal?

YES >> Inspection End.
NO >> Perform diagnosis procedure. Refer to SN-17, "Diagnosis Procedure (With Front and Rear Sonar System)".

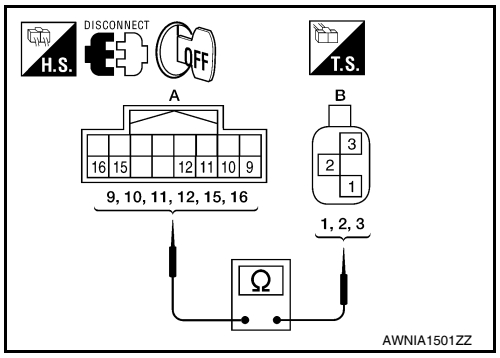
Diagnosis Procedure (With Rear Only Sonar System)

INFOID:0000000006146803

1. CHECK REAR SONAR SENSOR CIRCUITS

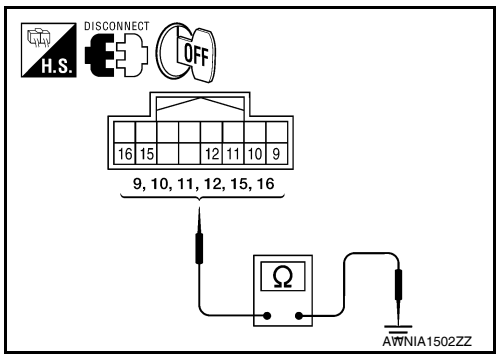
1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and rear sonar sensor connectors.
3. Check continuity between sonar control unit harness connector (A) and rear sonar sensor harness connectors (B).

Connector	Terminal	Connector	Terminal	Continuity
B24 (A)	16	C102, C103, C104, C105 (B)	1	Yes
	15		3	
	9, 10, 11, 12		2	



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

Connector	Terminal		Continuity
B24	9, 10, 11, 12, 15, 16	Ground	No



Are the inspection results normal?

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

Diagnosis Procedure (With Front and Rear Sonar System)

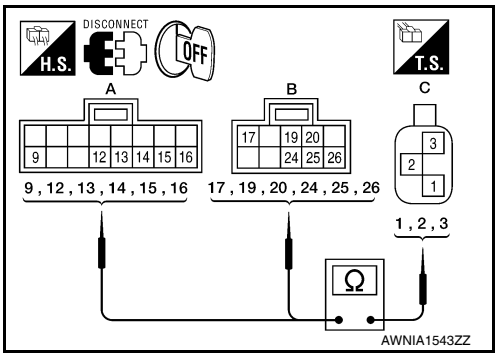
INFOID:0000000006146804

1. CHECK SONAR SENSOR CIRCUITS

1. Turn ignition switch OFF.

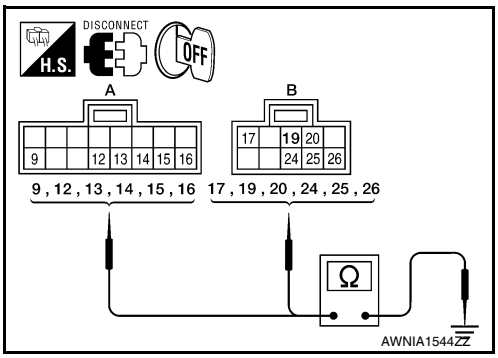
2. Disconnect sonar control unit connectors and sonar sensor connectors.
3. Check continuity between sonar control unit harness connectors (A, B) and sonar sensor harness connectors (C).

Connector	Terminal	Connector	Terminal	Continuity
B56 (A)	9	C102, C103, C104, C105	1	Yes
	12		3	
	13, 14, 15, 16		2	
B57 (B)	17	E158, E162, E163, E166	1	
	26		3	
	19, 20, 24, 25		2	



4. Check continuity between sonar control unit harness connectors (A, B) and ground.

Connector	Terminal		Continuity
B56 (A)	9, 12, 13, 14, 15, 16	Ground	No
B57 (B)	17, 19, 20, 24, 25, 26		



Are the inspection results normal?

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

Component Inspection (With Front and Rear Sonar System)

INFOID:0000000006607924

1. CHECK FUNCTION

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

Monitor Item	Display	Description
CR SEN [FL] CR SEN [FR] CR SEN [RL] CR SEN [RR]	ERROR	"ERROR" is displayed under the following conditions: • sensor is not detecting an obstacle • sensor is malfunctioning • sensor is disconnected • sensor circuit is open
	LV.2	The distance between the corner sensor and an obstacle is 30 cm (11.8 in) or more and less then 50 cm (19.6 in).
	LV.3	The distance between the corner sensor and an obstacle is less then 30 cm (11.8 in).
CTR SEN [RL] CTR SEN [RR] CTR SEN [FL] CTR SEN [FR]	ERROR	"ERROR" is displayed under the following conditions: • sensor is not detecting an obstacle • sensor is malfunctioning • sensor is disconnected • sensor circuit is open
	LV.0	The distance between the center sensor and an obstacle is more then 100 cm (39.3 in).
	LV.1	The distance between the center sensor and an obstacle is 60 cm (23.6 in) or more and less then 100 cm (39.3 in).
	LV.2	The distance between the center sensor and an obstacle is 50 cm (19.6 in) or more and less then 60 cm (23.6 in).
	LV.3	The distance between the center sensor and an obstacle is 30 cm (11.8 in) or more and less then 60 cm (19.6 in).
	LV.4	The distance between center sensor and an obstacle less than 30 cm (11.8 in).

Is the indication normal?

YES >> Inspection End.
NO >> Perform diagnosis procedure. Refer to SN-17, "Diagnosis Procedure (With Front and Rear Sonar System)".

SONAR BUZZER CIRCUIT INSPECTION

Description

INFOID:0000000006146805

When the A/T selector lever is not it park or neutral, a stationary object will be detected by the sonar sensors causing the front or rear sonar buzzer to sound a tone. As the vehicle moves closer to the object, the rate of the tone will increase. When the object is very close to the vehicle, the tone will sound continuously.

Component Function Check (With Front and Rear Sonar System)

INFOID:0000000006607925

1. CHECK FUNCTION

1. Select “BUZZER” in “Active test” mode with CONSULT-III.
2. Check the front and rear sonar sensor buzzer operation.

Test Item	CONSULT-III	Description
BUZZER	FRONT ON	Front sonar buzzer sounds
	REAR ON	Rear sonar buzzer sounds
	STOP	All buzzers OFF

Is the operation normal?

YES >> Inspection End.
NO >> Perform diagnosis procedure. Refer to SN-21, "Diagnosis Procedure (With Front and Rear Sonar System)".

Diagnosis Procedure (With Rear Only Sonar System)

INFOID:0000000006146806

1. CHECK SONAR BUZZER

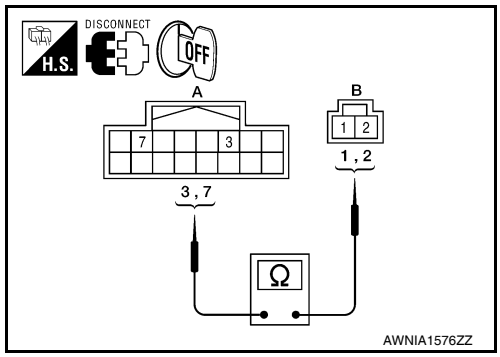
Refer to SN-21, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace sonar buzzer. Refer to SN-54, "Removal and Installation".

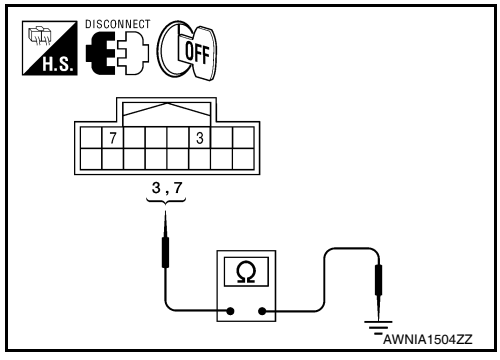
2. CHECK SONAR BUZZER CIRCUITS

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and sonar buzzer connector.
3. Check continuity between sonar control unit harness connector (A) and sonar buzzer harness connector (B).



Connector	Terminal	Connector	Terminal	Continuity
B24 (A)	3	M47 (B)	2	Yes
	7		1	

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



Connector	Terminal		Continuity
B24	3, 7	Ground	No

Are the inspection results normal?

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

Diagnosis Procedure (With Front and Rear Sonar System)

INFOID:0000000006146807

1.CHECK BUZZERS

Refer to SN-21, "Component Inspection".

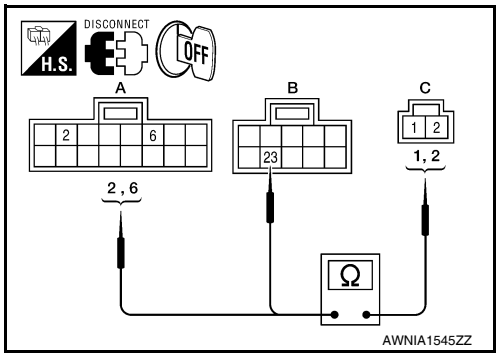
Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace buzzer. Refer to SN-54, "Removal and Installation".

2.CHECK BUZZER CIRCUITS

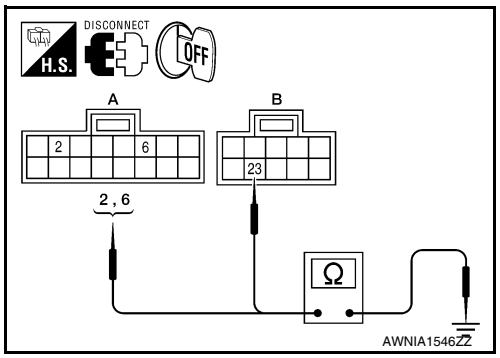
1. Turn ignition switch OFF.
2. Disconnect sonar control unit connectors and sonar buzzer connectors.
3. Check continuity between sonar control unit harness connectors (A, B) and sonar buzzer harness connectors (C).

Connector	Terminal	Connector	Terminal	Continuity
B56 (A)	2	B166, M118 (C)	1	Yes
	6	B166 (C)	2	
B57 (B)	23	M118 (C)		



4. Check continuity between sonar control unit harness connectors (A, B) and ground.

Connector	Terminal		Continuity
B56 (A)	2, 6	Ground	No
B57 (B)	23		



Are the inspection results normal?

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

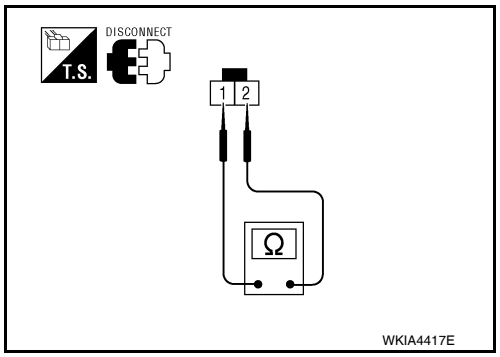
Component Inspection

INFOID:0000000006146808

SONAR BUZZER

1. Disconnect the sonar buzzer connector.
2. Check resistance between sonar buzzer terminals 1 and 2.

1 - 2 **: 50 Ω (+/- 10 Ω)**



SONAR SYSTEM OFF SWITCH CIRCUIT INSPECTION

Description

INFOID:0000000006146809

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

Component Function Check (With Front and Rear Sonar System)

INFOID:0000000006607926

SONAR SYSTEM OFF SWITCH

1. CHECK FUNCTION

1. Select “CANCEL SW” and “CANCEL SW IND” in “Data monitor” mode with CONSULT-III.
2. Check sonar system off switch signal under the following conditions.

Monitor Item	Display	Description
CANCEL SW	On	Sonar system OFF switch ON (sonar system is OFF).
	Off	Sonar system OFF switch OFF (sonar system is ON).
CANCEL SW IND	On	Sonar system OFF switch indicator lamp is ON.
	Off	Sonar system OFF switch indicator lamp is OFF.

Is the indication normal?

YES >> Inspection End.
NO >> Perform diagnosis procedure. Refer to SN-23, "Diagnosis Procedure (With Front and Rear Sonar System)".

SONAR SYSTEM OFF SWITCH INDICATOR

1. CHECK FUNCTION

1. Select “CANSEL SW IND” in “Active test” mode with CONSULT-III.
2. Check the sonar system off switch operation.

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

Is the operation normal?

YES >> Inspection End.
NO >> Perform diagnosis procedure. Refer to SN-23, "Diagnosis Procedure (With Front and Rear Sonar System)".

Diagnosis Procedure (With Rear Only Sonar System)

INFOID:0000000006146810

1. CHECK SONAR SYSTEM OFF SWITCH

Refer to SN-24, "Component Inspection".

Is the inspection result normal?

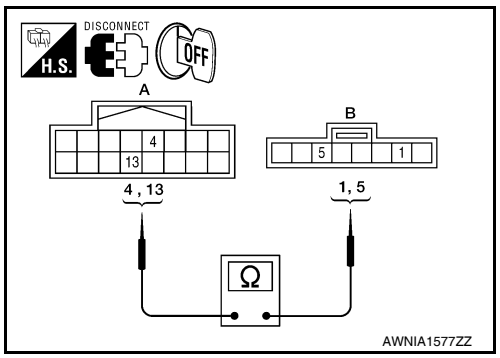
YES >> GO TO 2.
NO >> Replace sonar system OFF switch. Refer to IP-15, "Removal and Installation".

2. CHECK SONAR SYSTEM OFF SWITCH CIRCUITS

1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and sonar system OFF switch connector.

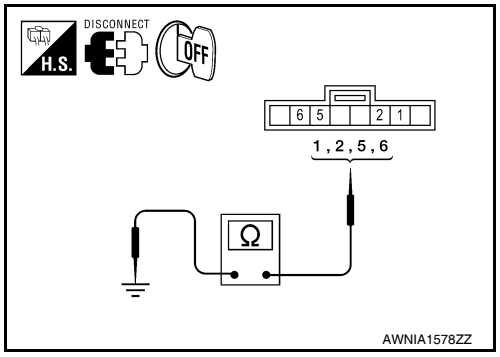
3. Check continuity between sonar control unit harness connector (A) and sonar system OFF switch harness connector (B).

Connector	Terminal	Connector	Terminal	Continuity
B24 (A)	4	M116 (B)	5	Yes
	13		1	



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

Connector	Terminal		Continuity
M116	1, 5	Ground	No
	2, 6		Yes



Are the inspection results normal?

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

Diagnosis Procedure (With Front and Rear Sonar System)

INFOID:0000000006146811

1.CHECK SONAR SYSTEM OFF SWITCH

Refer to SN-24, "Component Inspection".

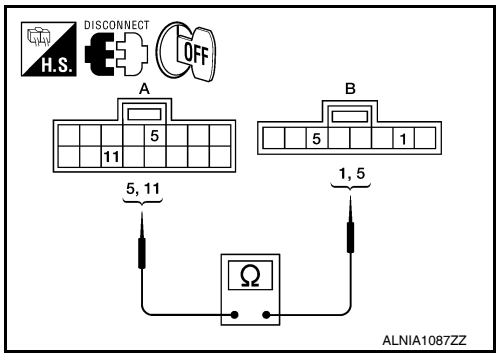
Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace sonar system OFF switch. Refer to IP-15, "Removal and Installation".

2.CHECK SONAR SYSTEM OFF SWITCH CIRCUITS

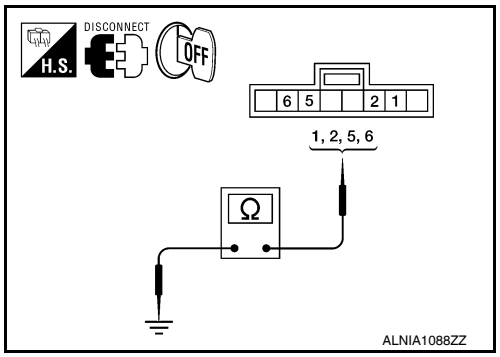
1. Turn ignition switch OFF.
2. Disconnect sonar control unit connector and sonar system OFF switch connector.
3. Check continuity between sonar control unit harness connector (A) and sonar system OFF switch harness connector (B).

Connector	Terminal	Connector	Terminal	Continuity
B56 (A)	5	M116 (B)	5	Yes
	11		1	



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

Connector	Terminal		Continuity
M116	1, 5	Ground	No
	2, 6		Yes



Are the inspection results normal?

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

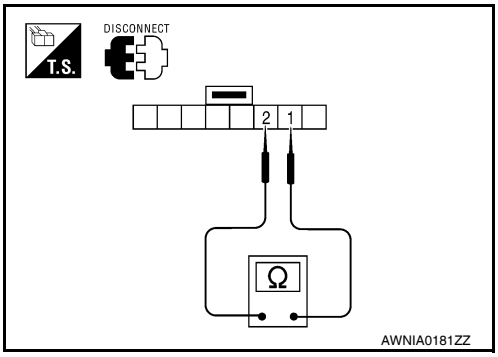
Component Inspection

INFOID:0000000006146812

SONAR SYSTEM OFF SWITCH

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

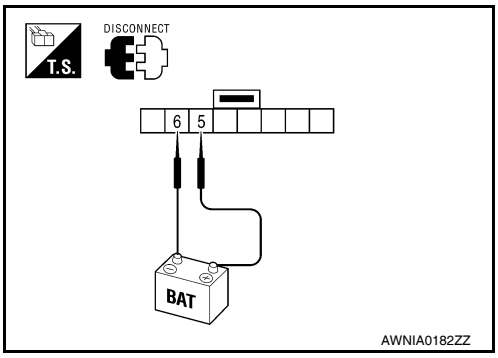
Sonar system OFF switch	Terminals	Continuity
Depressed	1 - 2	Yes
Released		No



SONAR SYSTEM OFF INDICATOR

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

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



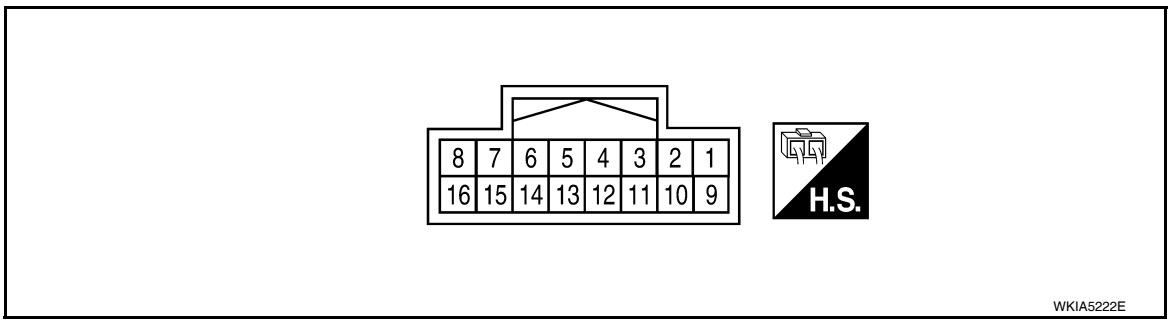
ECU DIAGNOSIS INFORMATION

SONAR CONTROL UNIT FOR REAR ONLY SONAR SYSTEM

Reference Value

INFOID:0000000006146813

SONAR CONTROL UNIT TERMINAL LAYOUT



TERMINALS AND REFERENCE VALUES FOR SONAR CONTROL UNIT

Terminal (wire color)	Item	Condition			Reference value (V) (Approx.)
		Ignition switch	Operation		
3 (R)	Sonar buzzer return	ON	—		0 - 12 (variable)
4 (BR/Y)	Sonar system OFF indicator output	ON	Sonar system OFF switch	ON	0
				OFF	Battery voltage
5 (G/W)	Reverse signal	ON	Transmission gear selector lever	R position	Battery voltage
			Transmission gear selector lever	Not R position	0
6 (B)	Sonar control unit ground	—	—		0
7 (L)	Sonar buzzer drive signal	ON	—		Battery voltage
8 (G/R)	Sonar control unit power	ON	—		Battery voltage
9 (GR)	Rear sonar sensor signal - RH outer	ON	• Sonar system OFF switch ON • Transmission gear selector lever in R position • No obstacles		Battery voltage
10 (P)	Rear sonar sensor signal - LH outer	ON	• Sonar system OFF switch ON • Transmission gear selector lever in R position • No obstacles		Battery voltage
11 (O)	Rear sonar sensor signal - LH inner	ON	• Sonar system OFF switch ON • Transmission gear selector lever in R position • Distance obstacles		Battery voltage
12 (LG)	Rear sonar sensor signal - RH inner	ON	• Sonar system OFF switch ON • Transmission gear selector lever in R position • Distance obstacles		Battery voltage
13 (LG)	Sonar system OFF switch signal	ON	Sonar system OFF switch	ON	0
				OFF	Battery voltage

Terminal (wire color)	Item	Condition		Reference value (V) (Approx.)
		Ignition switch	Operation	
15 (Y)	Rear sonar sensor ground	ON	—	0
16 (LG/B)	Rear sonar sensor power	ON	Ignition switch ON	Battery voltage

DTC Index

INFOID:0000000006146815

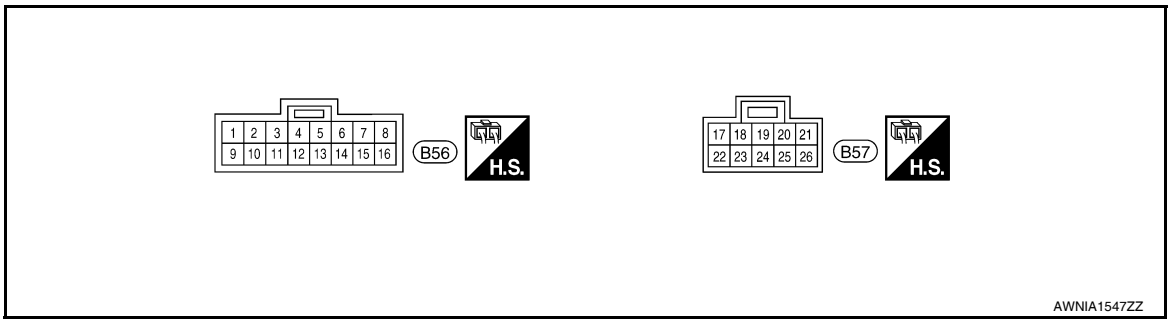
Fault Code	Malfunction	Service Procedure
11	Rear sonar sensor LH outer	1. Check harness for open or short. 2. Replace sonar sensor. Refer to SN-52, "Removal and Installation".
12	Rear sonar sensor LH inner	
13	Rear sonar sensor RH inner	
14	Rear sonar sensor RH outer	
21	Sonar buzzer	1. Refer to SN-21, "Component Inspection". 2. Check harness for open or short. 3. Refer to SN-48, "Symptom Table".
22	Sonar system OFF indicator	1. Refer to SN-24, "Component Inspection". 2. Check harness for open or short. 3. Refer to symptom table.
23	Sonar system OFF switch	
24	Sonar control unit	Replace sonar control unit. Refer to SN-53, "Removal and Installation".

SONAR CONTROL UNIT FOR FRONT AND REAR SONAR SYSTEM

Reference Value

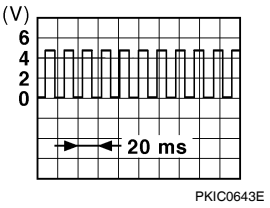
INFOID:0000000006146816

SONAR CONTROL UNIT HARNESS TERMINAL LAYOUT



TERMINALS AND REFERENCE VALUES FOR SONAR CONTROL UNIT

Terminal (color)	Item	Condition			Reference value (V) (Approx.)
		Ignition switch	Operation		
1 (G/R)	Sonar control unit power	ON	—		Battery voltage
2 (L)	Sonar buzzer drive signal	ON	Object sensed		Battery voltage
3 (G/W)	Reverse signal	ON	Transmission gear selector lever in R position		Battery voltage
			Transmission gear selector lever not in R position		0
4 (B)	Sonar control unit ground	—	—		—
5 (BR/Y)	Sonar system OFF indicator output	ON	Sonar system OFF switch	ON	0
				OFF	Battery voltage
6 (R)	Rear sonar buzzer return	ON	—		0 - 12 (variable)
8 (G/W)	K-line	ON	—		—
9 (LG/B)	Rear sonar sensor power	ON	Ignition switch ON		Battery voltage
11 (LG)	Sonar system OFF switch signal	ON	Sonar system OFF switch	ON	0
				OFF	Battery voltage
12 (Y)	Rear sonar sensor ground	ON	—		—
13 (LG)	Rear sonar sensor signal - RH inner	ON	• Sonar system OFF switch ON • Transmission gear selector lever in R position • Distance obstacles		Battery voltage
14 (O)	Rear sonar sensor signal - LH inner	ON	• Sonar system OFF switch ON • Transmission gear selector lever in R position • Distance obstacles		Battery voltage
15 (P)	Rear sonar sensor signal - LH outer	ON	• Sonar system OFF switch ON • Transmission gear selector lever in R position • No obstacles		Battery voltage

Terminal (color)	Item	Condition		Reference value (V) (Approx.)
		Ignition switch	Operation	
16 (GR)	Rear sonar sensor signal - RH outer	ON	• Sonar system OFF switch ON • Transmission gear selector lever in R position • No obstacles	Battery voltage
17 (LG/B)	Front sonar sensor power	ON	Ignition switch ON	Battery voltage
18 (GR/R)	Park position signal	ON	Vehicle in PARK	12
19 (GR)	Front sonar sensor signal - RH outer	ON	• Sonar system OFF switch ON • Transmission gear selector lever in a forward drive gear • Distance obstacles	Battery voltage
20 (LG)	Front sonar sensor signal - RH inner	ON	• Sonar system OFF switch ON • Transmission gear selector lever in reverse or a forward drive gear • No obstacles	Battery voltage
21 (W/R)	Vehicle speed signal	ON	Speedometer operated [When vehicle speed is approx. 40 km/h (25 MPH)]	**NOTE:** Maximum voltage may be 12V due to specifications (connected units).  PKIC0643E
23 (R)	Front sonar buzzer return	ON	—	0 - 12 (variable)
24 (P)	Front sonar sensor signal - LH outer	ON	• Sonar system OFF switch ON • Transmission gear selector lever in reverse or a forward drive gear • No obstacles	Battery voltage
25 (O)	Front sonar sensor signal - LH inner	ON	• Sonar system OFF switch ON • Transmission gear selector lever in a forward drive gear • Distance obstacles	Battery voltage
26 (Y)	Front sonar sensor ground	ON	—	—

DTC Index

INFOID:0000000006146818

DTC	Malfunction	Service Procedure
B2700	Front sonar sensor LH outer	Replace sonar sensor. Refer to SN-52, "Removal and Installation".
B2701	Front sonar sensor LH outer harness	1. Check harness for open or short. Refer to SN-17, "Diagnosis Procedure (With Front and Rear Sonar System)". 2. Replace sonar sensor. Refer to SN-52, "Removal and Installation".
B2702	Front sonar sensor RH outer	Replace sonar sensor. Refer to SN-52, "Removal and Installation".
B2703	Front sonar sensor RH outer harness	1. Check harness for open or short. Refer to SN-17, "Diagnosis Procedure (With Front and Rear Sonar System)". 2. Replace sonar sensor. Refer to SN-52, "Removal and Installation".

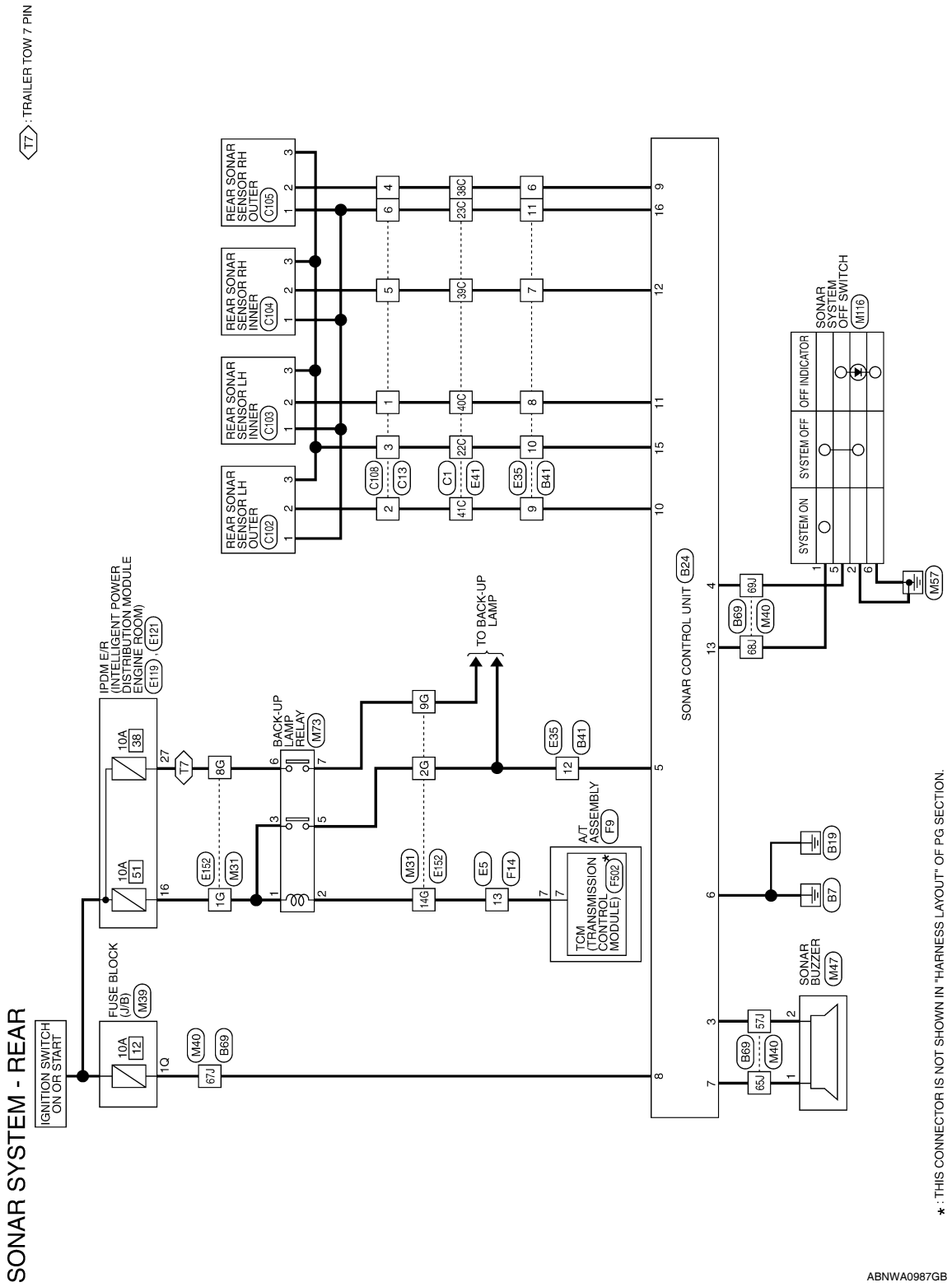
DTC	Malfunction	Service Procedure
B2704	Rear sonar sensor LH outer	Replace sonar sensor. Refer to SN-52, "Removal and Installation".
B2705	Rear sonar sensor LH outer harness	1. Check harness for open or short. Refer to SN-17, "Diagnosis Procedure (With Front and Rear Sonar System)". 2. Replace sonar sensor. Refer to SN-52, "Removal and Installation".
B2706	Rear sonar sensor RH outer	Replace sonar sensor. Refer to SN-52, "Removal and Installation".
B2707	Rear sonar sensor RH outer harness	1. Check harness for open or short. Refer to SN-17, "Diagnosis Procedure (With Front and Rear Sonar System)". 2. Replace sonar sensor. Refer to SN-52, "Removal and Installation".
B2708	Rear sonar sensor LH inner	Replace sonar sensor. Refer to SN-52, "Removal and Installation".
B2709	Rear sonar sensor LH inner harness	1. Check harness for open or short. Refer to SN-17, "Diagnosis Procedure (With Front and Rear Sonar System)". 2. Replace sonar sensor. Refer to SN-52, "Removal and Installation".
B270A	Rear sonar sensor RH inner	Replace sonar sensor. Refer to SN-52, "Removal and Installation".
B270B	Rear sonar sensor RH inner harness	1. Check harness for open or short. Refer to SN-17, "Diagnosis Procedure (With Front and Rear Sonar System)". 2. Replace sonar sensor. Refer to SN-52, "Removal and Installation".
B270C	Front sonar sensor LH inner	Replace sonar sensor. Refer to SN-52, "Removal and Installation".
B270D	Front sonar sensor LH inner harness	1. Check harness for open or short. Refer to SN-17, "Diagnosis Procedure (With Front and Rear Sonar System)". 2. Replace sonar sensor. Refer to SN-52, "Removal and Installation".
B270E	Front sonar sensor RH inner	Replace sonar sensor. Refer to SN-52, "Removal and Installation".
B270F	Front sonar sensor RH inner harness	1. Check harness for open or short. Refer to SN-17, "Diagnosis Procedure (With Front and Rear Sonar System)". 2. Replace sonar sensor. Refer to SN-52, "Removal and Installation".

WIRING DIAGRAM

SONAR SYSTEM

Wiring Diagram - Rear

INFOID:0000000006418153



SONAR SYSTEM CONNECTORS - REAR

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

H.S.

5G	4G	3G	2G	1G
10G	9G	8G	7G	6G

21G	20G	19G	18G	17G	16G	15G	14G	13G	12G	11G
30G	29G	28G	27G	26G	25G	24G	23G	22G		

41G	40G	39G	38G	37G	36G	35G	34G	33G	32G	31G
50G	49G	48G	47G	46G	45G	44G	43G	42G		

61G	60G	59G	58G	57G	56G	55G	54G	53G	52G	51G
70G	69G	68G	67G	66G	65G	64G	63G	62G		

75G	74G	73G	72G	71G
80G	79G	78G	77G	76G

Terminal No.	Color of Wire	Signal Name
1G	G	–
2G	G/W	–
8G	W/B	–
9G	Y/R	–
14G	R	–

Connector No.	M40
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

5J	4J	3J	2J	1J
10J	9J	8J	7J	6J

21J	20J	19J	18J	17J	16J	15J	14J	13J	12J	11J
30J	29J	28J	27J	26J	25J	24J	23J	22J		

41J	40J	39J	38J	37J	36J	35J	34J	33J	32J	31J
50J	49J	48J	47J	46J	45J	44J	43J	42J		

61J	60J	59J	58J	57J	56J	55J	54J	53J	52J	51J
70J	69J	68J	67J	66J	65J	64J	63J	62J		

75J	74J	73J	72J	71J
80J	79J	78J	77J	76J

Terminal No.	Color of Wire	Signal Name
57J	R	–
65J	L	–
67J	G/R	–
68J	LG	–
69J	BR/Y	–

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

H.S.

3Q		2Q	1Q
8Q	7Q	6Q	5Q	4Q

Terminal No.	Color of Wire	Signal Name
1Q	G/R	–

Connector No.	M47
Connector Name	SONAR BUZZER
Connector Color	BLACK

H.S.

1	2

Terminal No.	Color of Wire	Signal Name
1	L	–
2	R	–

ABNIA2446GB

Connector No.	M73
Connector Name	BACK-UP LAMP RELAY
Connector Color	BROWN

H.S.

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

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG	–
2	B	–
5	BR/Y	–
6	B	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
13	R	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
22C	Y	–
23C	LG/B	–
38C	GR	–
39C	LG	–
40C	O	–
41C	P	–

Connector No.	E35
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
6	GR	–
7	LG	–
8	O	–
9	P	–
10	Y	–
11	LG/B	–
12	G/W	–

ABNIA1316GB

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

H.S.

9	8	7	6		5	4	3
18	17	16	15	14	13	12	11	10

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

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

H.S.

29	28		27	26	25
36	35	34	33	32	31	30

Terminal No.	Color of Wire	Signal Name
27	W/B	TTOW REV LAMP

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

H.S.

1G	2G	3G	4G	5G
6G	7G	8G	9G	10G

11G	12G	13G	14G	15G	16G	17G	18G	19G	20G	21G
22G	23G	24G	25G	26G	27G	28G	29G	30G

31G	32G	33G	34G	35G	36G	37G	38G	39G	40G	41G
42G	43G	44G	45G	46G	47G	48G	49G	50G

51G	52G	53G	54G	55G	56G	57G	58G	59G	60G	61G
62G	63G	64G	65G	66G	67G	68G	69G	70G

71G	72G	73G	74G	75G
76G	77G	78G	79G	80G

Terminal No.	Color of Wire	Signal Name
1G	G	–
2G	G/W	–
8G	W/B	–
9G	Y/R	–
14G	R	–

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

H.S.

5	4	3	2	1
10	9	8	7	6

Terminal No.	Color of Wire	Signal Name
7	R	–

ABNIA2447GB

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

H.S.

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

Terminal No.	Color of Wire	Signal Name
13	R	–

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

H.S.

10	9	8	7	6	5	4	3	2	1

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

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

H.S.

5C		4C	3C	2C		1C
11C	10C	9C		8C	7C	6C

21C	20C	19C	18C	17C	16C	15C	14C	13C	12C
31C	30C	29C	28C	27C		26C	25C	24C	23C	22C
41C	40C	39C	38C	37C	36C	35C	34C	33C	32C
47C	46C	45C				44C	43C	42C
52C				51C	50C	49C			48C

Terminal No.	Color of Wire	Signal Name
22C	Y	–
23C	LG/B	–
38C	GR	–
39C	LG	–
40C	O	–
41C	P	–

Connector No.	C13
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

3	2	1
6	5	4

Terminal No.	Color of Wire	Signal Name
1	O	–
2	P	–
3	Y	–
4	GR	–
5	LG	–
6	LG/B	–

ABNIA2448GB

Connector No.	C102
Connector Name	REAR SONAR SENSOR LH OUTER
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG/B	PWR
2	P	SIGNAL
3	Y	GND

Connector No.	C103
Connector Name	REAR SONAR SENSOR LH INNER
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG/B	PWR
2	O	SIGNAL
3	Y	GND

Connector No.	C104
Connector Name	REAR SONAR SENSOR RH INNER
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG/B	PWR
2	LG	SIGNAL
3	Y	GND

Connector No.	C105
Connector Name	REAR SONAR SENSOR RH OUTER
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG/B	PWR
2	GR	SIGNAL
3	Y	GND

Connector No.	C108
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	O	–
2	P	–
3	Y	–
4	GR	–
5	LG	–
6	LG/B	–

ABNIA2449GB

Connector No.	B24
Connector Name	SONAR CONTROL UNIT (WITH REAR SONAR SYSTEM)
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
1	–	–
2	–	–
3	R	SOUNDER -
4	BR/Y	STATUS LED
5	G/W	REVERSE LAMP SIGNAL
6	B	AI GND
7	L	SOUNDER +
8	G/R	AI POWER

Terminal No.	Color of Wire	Signal Name
9	GR	SENSOR SIGNAL ROR
10	P	SENSOR SIGNAL ROL
11	O	SENSOR SIGNAL RIL
12	LG	SENSOR SIGNAL RIR
13	LG	ON/OFF SWITCH
14	–	–
15	Y	REAR SENSOR GND
16	LG/B	REAR SENSOR PWR

Connector No.	B41
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1	2	3		4	5
6	7	8	9	10	11	12

Terminal No.	Color of Wire	Signal Name
6	GR	–
7	LG	–
8	O	–
9	P	–
10	Y	–
11	LG/B	–
12	G/W	–

Connector No.	B69
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1J	2J	3J	4J	5J
6J	7J	8J	9J	10J

11J	12J	13J	14J	15J	16J	17J	18J	19J	20J	21J
	22J	23J	24J	25J	26J	27J	28J	29J	30J	

31J	32J	33J	34J	35J	36J	37J	38J	39J	40J	41J
	42J	43J	44J	45J	46J	47J	48J	49J	50J	

51J	52J	53J	54J	55J	56J	57J	58J	59J	60J	61J
	62J	63J	64J	65J	66J	67J	68J	69J	70J	

71J	72J	73J	74J	75J
76J	77J	78J	79J	80J

Terminal No.	Color of Wire	Signal Name
57J	R	–
65J	L	–
67J	G/R	–
68J	LG	–
69J	BR/Y	–

ABNIA2450GB

Wiring Diagram - Front And Rear

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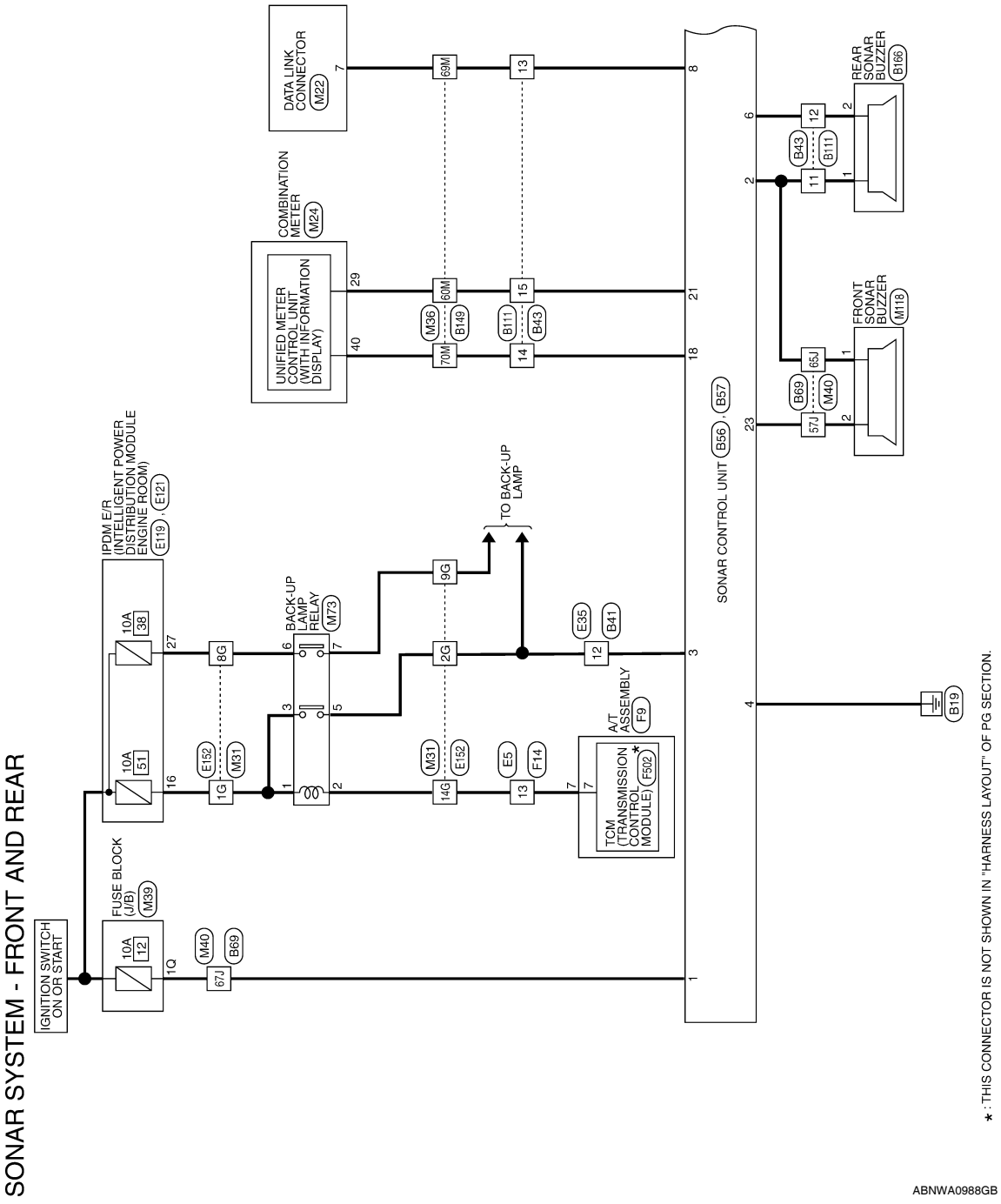
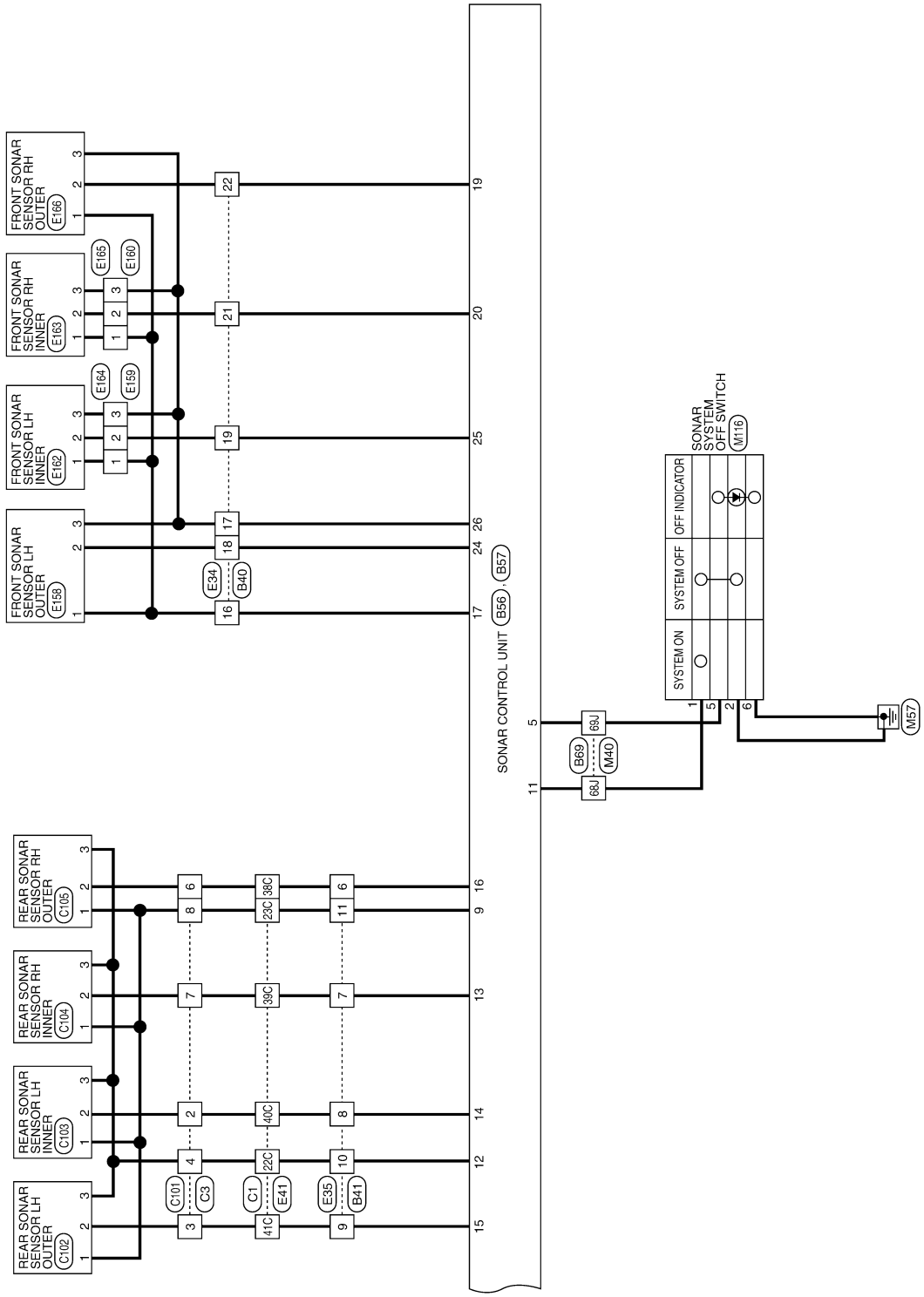




ABNWA0372GB

SONAR SYSTEM CONNECTORS - FRONT AND REAR

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

H.S.

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

Terminal No.	Color of Wire	Signal Name
7	G/W	–

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE

H.S.

20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21

Terminal No.	Color of Wire	Signal Name
29	W/R	SPEED OUT
40	GR/R	PN REVERSE

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

H.S.

5G	4G	3G	2G	1G
10G	9G	8G	7G	6G

21G	20G	19G	18G	17G	16G	15G	14G	13G	12G	11G
30G	29G	28G	27G	26G	25G	24G	23G	22G		

41G	40G	39G	38G	37G	36G	35G	34G	33G	32G	31G
50G	49G	48G	47G	46G	45G	44G	43G	42G		

61G	60G	59G	58G	57G	56G	55G	54G	53G	52G	51G
70G	69G	68G	67G	66G	65G	64G	63G	62G		

75G	74G	73G	72G	71G
80G	79G	78G	77G	76G

Terminal No.	Color of Wire	Signal Name
1G	G	–
2G	G/W	–
8G	W/B	–
9G	Y/R	–
14G	R	–

Connector No.	M36
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

5M	4M	3M	2M	1M
10M	9M	8M	7M	6M

21M	20M	19M	18M	17M	16M	15M	14M	13M	12M	11M
30M	29M	28M	27M	26M	25M	24M	23M	22M		

41M	40M	39M	38M	37M	36M	35M	34M	33M	32M	31M
50M	49M	48M	47M	46M	45M	44M	43M	42M		

61M	60M	59M	58M	57M	56M	55M	54M	53M	52M	51M
70M	69M	68M	67M	66M	65M	64M	63M	62M		

75M	74M	73M	72M	71M
80M	79M	78M	77M	76M

Terminal No.	Color of Wire	Signal Name
60M	W/R	–
69M	G/W	–
70M	GR/R	–

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

H.S.

3Q		2Q	1Q
8Q	7Q	6Q	5Q	4Q

Terminal No.	Color of Wire	Signal Name
1Q	G/R	–

ABNIA2451GB

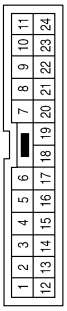
Connector No.	M73
Connector Name	BACK-UP LAMP RELAY
Connector Color	BROWN

H.S.

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

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

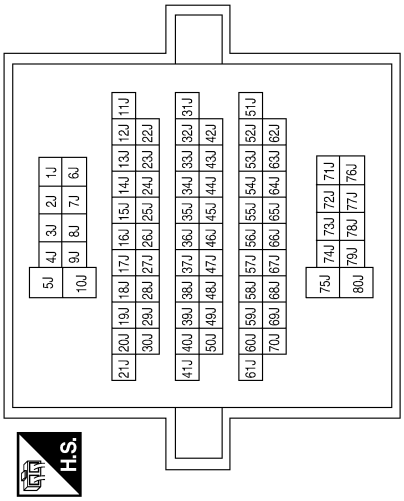
H.S.



Terminal No.	Color of Wire	Signal Name
13	R	–

Connector No.	M40
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
57J	R	–
65J	L	–
67J	G/R	–
68J	LG	–
69J	BR/Y	–

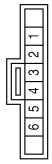
Connector No.	M118
Connector Name	FRONT SONAR BUZZER
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	L	–
2	R	–

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

H.S.



Terminal No.	Color of Wire	Signal Name
1	LG	–
2	B	–
5	BR/Y	–
6	B	–

ABNIA2458GB

Connector No.	E34
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
16	LG/B	–
17	Y	–
18	P	–
19	O	–
21	LG	–
22	GR	–

Connector No.	E35
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

5	4		3	2	1
12	11	10	9	8	7	6

Terminal No.	Color of Wire	Signal Name
6	GR	–
7	LG	–
8	O	–
9	P	–
10	Y	–
11	LG/B	–
12	G/W	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
22C	Y	–
23C	LG/B	–
38C	GR	–
39C	LG	–
40C	O	–
41C	P	–

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

H.S.

9	8	7	6		5	4	3
18	17	16	15	14	13	12	11	10

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

ABNIA2459GB

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

H.S.

29	28		27	26	25
36	35	34	33	32	31

Terminal No.	Color of Wire	Signal Name
27	W/B	TTOW REV LAMP

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

H.S.

1G	2G	3G	4G	5G
6G	7G	8G	9G	10G

11G	12G	13G	14G	15G	16G	17G	18G	19G	20G	21G
	22G	23G	24G	25G	26G	27G	28G	29G	30G	

31G	32G	33G	34G	35G	36G	37G	38G	39G	40G	41G
	42G	43G	44G	45G	46G	47G	48G	49G	50G	

51G	52G	53G	54G	55G	56G	57G	58G	59G	60G	61G
	62G	63G	64G	65G	66G	67G	68G	69G	70G	

71G	72G	73G	74G	75G
76G	77G	78G	79G	80G

Terminal No.	Color of Wire	Signal Name
1G	G	–
2G	G/W	–
8G	W/B	–
9G	Y/R	–
14G	R	–

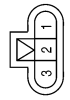
Connector No.	E158
Connector Name	FRONT SONAR SENSOR LH OUTER
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG/B	PWR
2	P	SIGNAL
3	Y	GND

Connector No.	E159
Connector Name	WIRE TO WIRE
Connector Color	GRAY

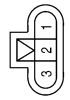
H.S.



Terminal No.	Color of Wire	Signal Name
1	LG/B	–
2	O	–
3	Y	–

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

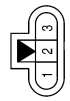
H.S.



Terminal No.	Color of Wire	Signal Name
1	LG/B	–
2	LG	–
3	Y	–

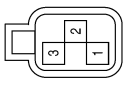
ABNIA2452GB

Connector No.	E164
Connector Name	WIRE TO WIRE
Connector Color	GRAY



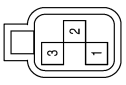
Terminal No.	Color of Wire	Signal Name
1	LG/B	–
2	O	–
3	Y	–

Connector No.	E163
Connector Name	FRONT SONAR SENSOR RH INNER
Connector Color	BLACK



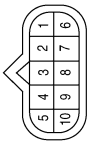
Terminal No.	Color of Wire	Signal Name
1	LG/B	PWR
2	LG	SIGNAL
3	Y	GND

Connector No.	E162
Connector Name	FRONT SONAR SENSOR LH INNER
Connector Color	BLACK



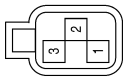
Terminal No.	Color of Wire	Signal Name
1	LG/B	PWR
2	O	SIGNAL
3	Y	GND

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



Terminal No.	Color of Wire	Signal Name
7	R	–

Connector No.	E166
Connector Name	FRONT SONAR SENSOR RH OUTER
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	LG/B	PWR
2	GR	SIGNAL
3	Y	GND

Connector No.	E165
Connector Name	WIRE TO WIRE
Connector Color	GRAY

Terminal No.	Color of Wire	Signal Name
1	LG/B	–
2	LG	–
3	Y	–

ABNIA2453GB

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

H.S.

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

Terminal No.	Color of Wire	Signal Name
13	R	–

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

H.S.

10	9	8	7	6	5	4	3	2	1

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

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

H.S.

5C		4C	3C	2C		1C
11C	10C	9C		8C	7C	6C
21C	20C	19C	18C	17C	16C	15C	14C	13C	12C
31C	30C	29C	28C	27C	26C	25C	24C	23C	22C
41C	40C	39C	38C	37C	36C	35C	34C	33C	32C
47C	46C	45C					44C	43C	42C
52C			51C	50C	49C				48C

Terminal No.	Color of Wire	Signal Name
22C	Y	–
23C	LG/B	–
38C	GR	–
39C	LG	–
40C	O	–
41C	P	–

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

H.S.

4	3	2	1
8	7	6	5

Terminal No.	Color of Wire	Signal Name
2	O	–
3	P	–
4	Y	–
6	GR	–
7	LG	–
8	LG/B	–

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Connector No.	C101
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
2	O	–
3	P	–
4	Y	–
6	GR	–
7	LG	–
8	LG/B	–

Connector No.	C102
Connector Name	REAR SONAR SENSOR LH OUTER
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG/B	PWR
2	P	SIGNAL
3	Y	GND

Connector No.	C103
Connector Name	REAR SONAR SENSOR LH INNER
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG/B	PWR
2	O	SIGNAL
3	Y	GND

Connector No.	C104
Connector Name	REAR SONAR SENSOR RH INNER
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG/B	PWR
2	LG	SIGNAL
3	Y	GND

Connector No.	C105
Connector Name	REAR SONAR SENSOR RH OUTER
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG/B	PWR
2	GR	SIGNAL
3	Y	GND

Connector No.	B40
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
16	LG/B	–
17	Y	–
18	P	–
19	O	–
21	LG	–
22	GR	–

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Connector No.	B41
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1	2	3		4	5
6	7	8	9	10	11	12

Terminal No.	Color of Wire	Signal Name
6	GR	–
7	LG	–
8	O	–
9	P	–
10	Y	–
11	LG/B	–
12	G/W	–

Connector No.	B43
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
11	L	–
12	R	–
13	G/W	–
14	GR/R	–
15	W/R	–

Connector No.	B56
Connector Name	SONAR CONTROL UNIT (WITH FRONT AND REAR SONAR SYSTEM)
Connector Color	GRAY

H.S.

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

Terminal No.	Color of Wire	Signal Name
1	G/R	IGN
2	L	RR SOUNDER (+)
3	G/W	REVERSE LAMP SIG
4	B	GND
5	BR/Y	LED STATUS
6	R	RR SOUNDER (-)
7	–	–
8	G/W	K-LINE
9	LG/B	PWR
10	–	–
11	LG	DISABLE SW
12	Y	GND
13	LG	RIR
14	O	RIL
15	P	ROL
16	GR	ROR

Connector No.	B57
Connector Name	SONAR CONTROL UNIT (WITH FRONT AND REAR SONAR SYSTEM)
Connector Color	GRAY

H.S.

17	18	19	20	21
22	23	24	25	26

Terminal No.	Color of Wire	Signal Name
17	LG/B	POWER
18	GR/R	PARK-POS
19	GR	FOR
20	LG	FIR
21	W/R	VEHICLE SPEED
22	–	–
23	R	FR SOUNDER(-)
24	P	FOL
25	O	FIL
26	Y	GND

ABNIA2456GB

Connector No.	B69
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1U	2U	3U	4U	5U
6U	7U	8U	9U	10U

11U	12U	13U	14U	15U	16U	17U	18U	19U	20U	21U
22U	23U	24U	25U	26U	27U	28U	29U	30U		

31U	32U	33U	34U	35U	36U	37U	38U	39U	40U	41U
42U	43U	44U	45U	46U	47U	48U	49U	50U		

51U	52U	53U	54U	55U	56U	57U	58U	59U	60U	61U
62U	63U	64U	65U	66U	67U	68U	69U	70U		

71U	72U	73U	74U	75U
76U	77U	78U	79U	80U

Terminal No.	Color of Wire	Signal Name
57J	R	–
65J	L	–
67J	G/R	–
68J	LG	–
69J	BR/Y	–

Connector No.	B111
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
11	L	–
12	R	–
13	G/W	–
14	GR/R	–
15	W/R	–

Connector No.	B149
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1M	2M	3M	4M	5M
6M	7M	8M	9M	10M

11M	12M	13M	14M	15M	16M	17M	18M	19M	20M	21M
22M	23M	24M	25M	26M	27M	28M	29M	30M		

31M	32M	33M	34M	35M	36M	37M	38M	39M	40M	41M
42M	43M	44M	45M	46M	47M	48M	49M	50M		

51M	52M	53M	54M	55M	56M	57M	58M	59M	60M	61M
62M	63M	64M	65M	66M	67M	68M	69M	70M		

71M	72M	73M	74M	75M
76M	77M	78M	79M	80M

Terminal No.	Color of Wire	Signal Name
60M	W/R	–
69M	G/W	–
70M	GR/R	–

Connector No.	B166
Connector Name	REAR SONAR BUZZER
Connector Color	BLACK

H.S.

1	2

Terminal No.	Color of Wire	Signal Name
1	L	–
2	R	–

ABNIA2457GB

SYMPTOM DIAGNOSIS

SONAR SYSTEM SYMPTOMS

Symptom Table

INFOID:0000000006607933

NOTE:
Always perform Preliminary Check and Self-Diagnosis Function before diagnosing vehicle by symptom. Refer to SN-6, "Preliminary Check" and SN-8, "Self-Diagnosis Function" (with rear only sonar system) or SN-13, "CONSULT-III Function (SONAR)" (with front and rear sonar system).

Symptom	Repair order
When the transmission gear selector lever is in the R position and the sonar system is ON, the rear sonar system does not operate.	1. Check sonar control unit power and ground circuits. Refer to SN-15, "Diagnosis Procedure (With Rear Only Sonar System)" or SN-15, "Diagnosis Procedure (With Front and Rear Sonar System)". 2. Check transmission range switch. Refer to TM-45, "Diagnosis Procedure". 3. Check back-up lamp relay. 4. Check related harness and connections for back-up lamp relay. 5. Check rear sonar sensors. Refer to SN-17, "Component Function Check (With Front and Rear Sonar System)". 6. Check rear sonar buzzer. Refer to SN-20, "Component Function Check (With Front and Rear Sonar System)". 7. Replace sonar control unit. Refer to SN-53, "Removal and Installation".
When the transmission gear selector lever is in a forward drive gear and the sonar system is ON, the front sonar system does not operate. (With front and rear sonar system)	1. Check sonar control unit power and ground circuits. Refer to SN-15, "Diagnosis Procedure (With Front and Rear Sonar System)". 2. Check harness and connections between sonar control unit and combination meter. 3. Check front sonar sensors. Refer to SN-17, "Component Function Check (With Front and Rear Sonar System)". 4. Check front sonar buzzer. Refer to SN-20, "Component Function Check (With Front and Rear Sonar System)". 5. Replace sonar control unit. Refer to SN-53, "Removal and Installation".
Sonar Control Unit will not enter Diagnostic Mode (no communication).	1. Check sonar control unit power and ground circuits. Refer to SN-15, "Diagnosis Procedure (With Rear Only Sonar System)" or SN-15, "Diagnosis Procedure (With Front and Rear Sonar System)". 2. Check K-Line to data link connector (with Front and Rear sonar system). 3. Check harness and connections for sonar system OFF switch. Refer to SN-22, "Diagnosis Procedure (With Rear Only Sonar System)". 4. Replace sonar control unit. Refer to SN-53, "Removal and Installation".
Buzzer sounds although there are no obstacles within the detection range (false detection).	1. Check all sonar sensors for misalignment or damage (including bumper and fascia). Refer to SN-6, "Preliminary Check". 2. Check all sonar sensors for dirt or ice buildup. Refer to SN-6, "Preliminary Check". 3. Check sonar sensors. Refer to SN-17, "Diagnosis Procedure (With Rear Only Sonar System)" or SN-17, "Diagnosis Procedure (With Front and Rear Sonar System)". 4. Replace sonar control unit. Refer to SN-53, "Removal and Installation".

Symptom	Repair order
When sonar system is ON, the sonar system OFF indicator lamp lights up and the sonar buzzer sounds intermittently (for about 4 seconds). (With rear only sonar system)	1. Check sonar sensors. Refer to SN-6, "Preliminary Check". 2. Check harnesses between sonar sensors and sonar control unit for an open condition. Refer to SN-17, "Diagnosis Procedure (With Rear Only Sonar System)". 3. Replace sonar control unit. Refer to SN-53, "Removal and Installation".
The sonar system still operates when the sonar system OFF indicator lamp is ON.	1. Check sonar system OFF indicator lamp. Refer to SN-22, "Component Function Check (With Front and Rear Sonar System)". 2. Replace sonar control unit. Refer to SN-53, "Removal and Installation".
The sonar sensors do not detect objects within the detectable range (intermittent operation).	1. Check sonar sensors. Refer to SN-6, "Preliminary Check" and SN-18, "Component Inspection (With Front and Rear Sonar System)". 2. Replace sonar control unit. Refer to SN-53, "Removal and Installation".
When the sonar system is OFF, the OFF indicator does not light and the sonar buzzer does not sound.	1. Check sonar system OFF switch. Refer to SN-24, "Component Inspection". 2. Check harness and connections for sonar system OFF switch. Refer to SN-22, "Diagnosis Procedure (With Rear Only Sonar System)" or SN-23, "Diagnosis Procedure (With Front and Rear Sonar System)". 3. Replace sonar control unit. Refer to SN-53, "Removal and Installation".
When the sonar system is OFF, the OFF indicator lamp does not light but the sonar buzzer does sound.	1. Check sonar system OFF indicator lamp. Refer to SN-24, "Component Inspection". 2. Check harness and connections for sonar system OFF indicator lamp. Refer to SN-22, "Diagnosis Procedure (With Rear Only Sonar System)" or SN-23, "Diagnosis Procedure (With Front and Rear Sonar System)". 3. Replace sonar control unit. Refer to SN-53, "Removal and Installation".
When the sonar system is OFF, the sonar buzzer does not sound but the OFF indicator lamp lights.	1. Check sonar buzzer. Refer to SN-21, "Component Inspection". 2. Check harness and connections between sonar buzzer and sonar control unit. Refer to SN-20, "Diagnosis Procedure (With Rear Only Sonar System)" or SN-21, "Diagnosis Procedure (With Front and Rear Sonar System)". 3. Replace sonar control unit. Refer to SN-53, "Removal and Installation".

PRECAUTION

PRECAUTION

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

INFOID:0000000006146820

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

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

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

WARNING:

- **When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.**

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000006707596

NOTE:

- This Procedure is applied only to models with Intelligent Key system and NATS (NISSAN ANTI-THEFT SYSTEM).
- Remove and install all control units after disconnecting both battery cables with the ignition knob in the ″LOCK″ position.
- Always use CONSULT-III to perform self-diagnosis as a part of each function inspection after finishing work. If DTC is detected, perform trouble diagnosis according to self-diagnostic results.

For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.
For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.
If steering wheel rotation is required when battery power is interrupted, follow the procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. Use the Intelligent Key or mechanical key to turn the ignition switch to the ″ACC″ position. At this time, the steering lock will be released.
3. Disconnect both battery cables. The steering lock will remain released and the steering wheel can be rotated.
4. Perform the necessary repair operation.

5. When the repair work is completed, return the ignition switch to the ″LOCK″ position before connecting the battery cables. (At this time, the steering lock mechanism will engage.)
6. Perform a self-diagnosis check of all control units using CONSULT-III.

UNIT REMOVAL AND INSTALLATION

SONAR SENSOR

Removal and Installation

INFOID:0000000006146822

FRONT SONAR SENSOR

Removal

1. Remove the front fascia assembly. Refer to EXT-15, "Removal and Installation".
2. Remove the front sonar sensor from the front fascia assembly.
3. Disconnect the front sonar sensor connector.
4. Remove the front sonar sensor housing from the front fascia assembly.

Installation

Installation is in the reverse order of removal.

REAR SONAR SENSOR

Removal

1. Remove the rear fascia assembly. Refer to EXT-19, "Removal and Installation".
2. Remove the rear sonar sensor from the rear fascia assembly.
3. Disconnect the rear sonar sensor connector.
4. Remove the rear sonar sensor housing from the rear fascia assembly.

Installation

Installation is in the reverse order of removal.

SONAR CONTROL UNIT

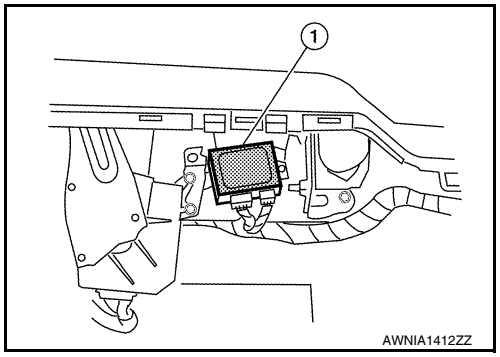
Removal and Installation

INFOID:0000000006146823

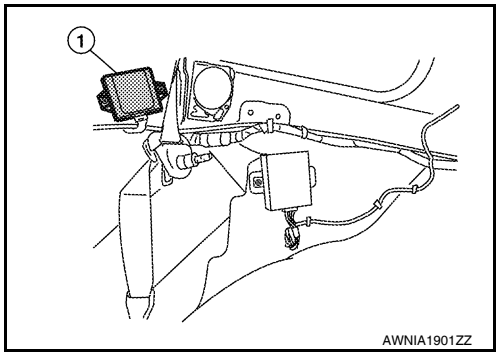
Removal

1. Remove the luggage side finisher lower LH. Refer to INT-20, "Removal and Installation".
2. Disconnect the sonar control unit electrical connectors.
3. Remove the bolt, then remove the sonar control unit.

- Models with front and rear sonar.
  –Front and rear sonar control unit (1)



- Models with rear sonar only.
  – Rear sonar control unit (1)



Installation

Installation is in the reverse order of removal.

BUZZER

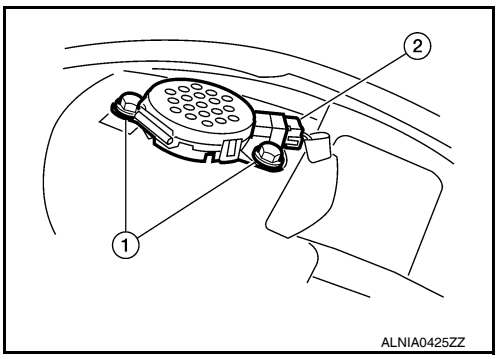
Removal and Installation

INFOID:0000000006146824

FRONT BUZZER

Removal

1. Remove the instrument panel upper cover. Refer to IP-13, "Removal and Installation".
2. Remove the two bolts (1), disconnect the connector (2) and remove the front buzzer.



Installation

Installation is in the reverse order of removal.

REAR BUZZER

NOTE:

Rear buzzer location used only for vehicles equipped with both front and rear sonar systems. For vehicles with rear sonar only, the buzzers is located in the front buzzer location.

Removal

1. Partially remove the rear headliner. Refer to INT-17, "Removal and Installation".
2. Release the buzzer from the bracket, disconnect the connector and remove the buzzer.

Installation

Installation is in the reverse order of removal.