SECTION DAS
DRIVER ASSISTANCE SYSTEM

CONTENTS

ITS CONTROL UNIT

LDW

BSW

PRECAUTION

PRECAUTIONS

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

INFOID:0000000009951635

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, 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:

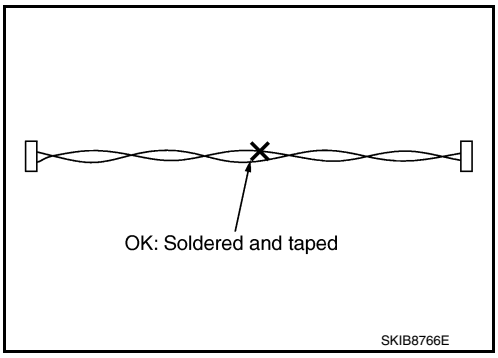
- **When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious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

Precautions For Harness Repair

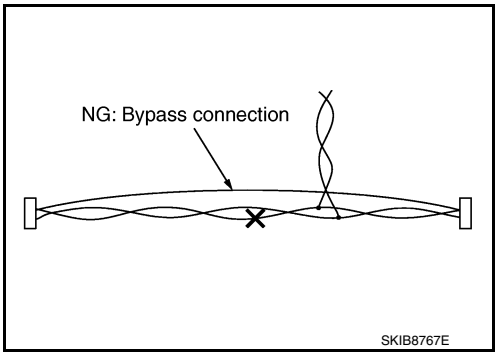
INFOID:0000000009464647

ITS communication uses a twisted pair line. Be careful when repairing it.

- Solder the repaired area and wrap tape around the soldered area.
  NOTE:
  A fray of twisted lines must be within 110 mm (4.33 in).



- Bypass connection is never allowed at the repaired area.
  NOTE:
  Bypass connection may cause ITS communication error. The spliced wire becomes separated and the characteristics of twisted line are lost.



SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

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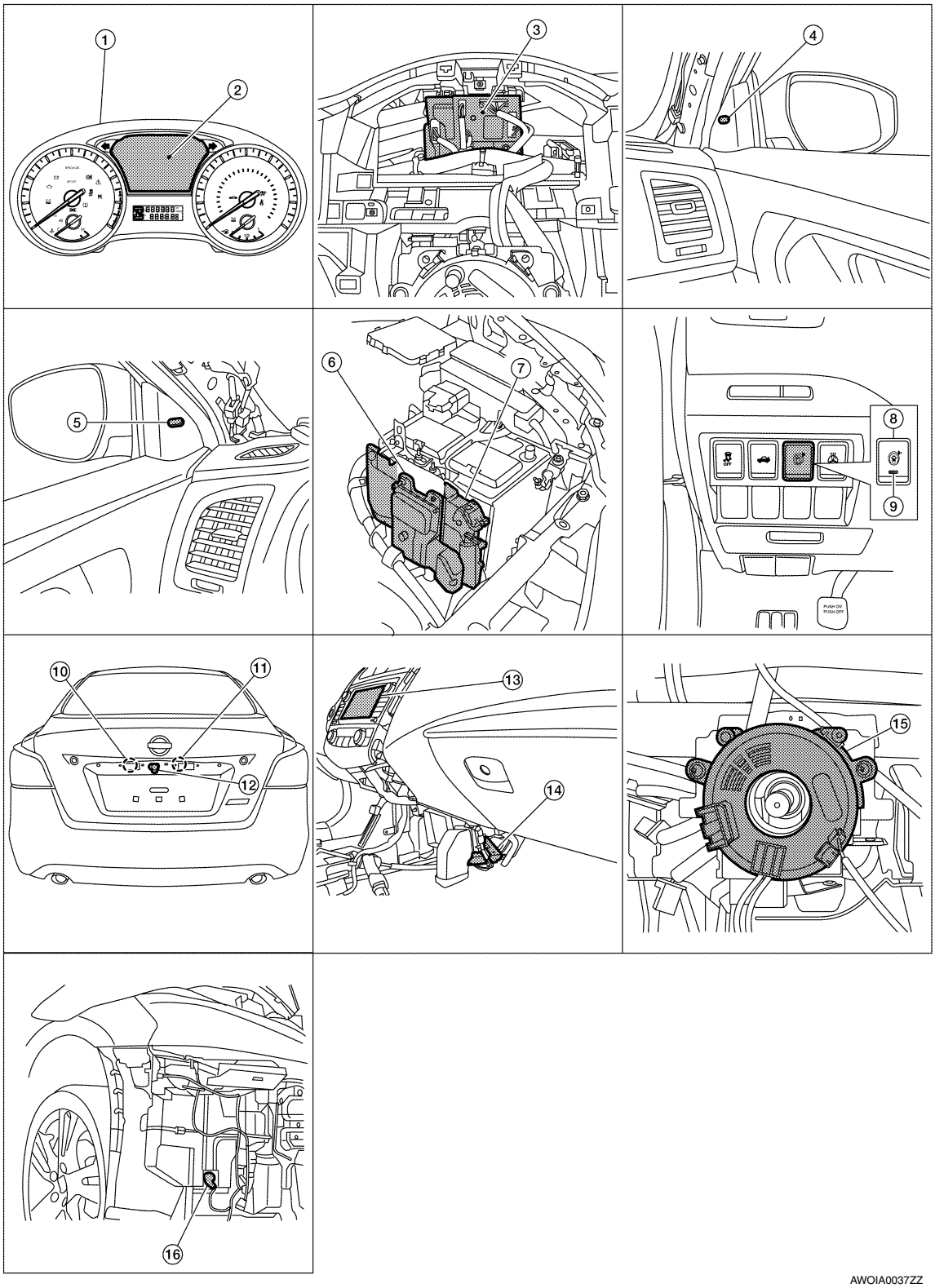

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1. Combination meter
2. Vehicle information display
3. BCM (view with combination meter removed)
4. Blind spot warning indicator RH
5. Blind spot warning indicator LH
6. TCM
7. ECM
8. Warning systems switch
9. Warning systems ON indicator
10. Rear view camera washer control unit
11. Rear view camera air pump motor
12. Rear view camera
13. AV control unit (center display) (with navigation system and bose audio system) Audio unit (center display) (with display audio system and bose audio system)
14. ITS control unit (view with center console removed)
15. Steering angle sensor (view with steering wheel removed)
16. Washer fluid level switch (view with front fascia removed)

Component Description

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Component	Description
ITS control unit	• Controls each system, based on signals received from the rear view camera and CAN communication signals received from each control unit • Transmits signals necessary for control between CAN communication
Blind Spot Warning indicator LH/ RH	Receives Blind Spot Warning indicator operation signal from rear view camera and turns OFF, turns ON or blinks
Warning systems switch	Inputs the switch signal to ITS control unit
Warning systems ON indicator (On the warning systems switch)	Indicates BSW/LDW system status
Rear view camera	• Detects the lane marker by the built-in camera • Transmits detected lane condition signal to ITS control unit
ABS actuator and electric unit (control unit)	• Transmits vehicle speed signal to ITS control unit via CAN communication • Transmits yaw rate signal/side G sensor signal to ITS control unit via CAN communication
Buzzer (combination meter)	Receives buzzer signal from ITS control unit and sounds buzzer.
Combination meter	• Turns the Lane Departure Warning/Blind Spot Warning indicator ON/OFF according to the signals from the ITS control unit via CAN communication • Receives Lane Departure Warning/Blind Spot Warning ON indicator signal via CAN communication.
Steering angle sensor	Transmits steering angle sensor signal to ITS control unit via CAN communication
BCM	• Transmits turn signal indicator to ITS control unit via CAN communication • Transmits dimmer signal to ITS control unit via CAN communication
ECM	Transmits engine speed signal to ITS control unit via CAN communication
TCM	Transmits the output shaft speed signal, input speed signal, current gear position signal and shift position signal to ITS control unit via CAN communication
AV control unit (with navigation system and bose audio system)	Receives the various systems and camera signals via CAN communication and routes them to the center display
Audio unit (with display audio system and bose audio system)	Receives the various systems and camera signals and routes them to the center display
Center display	Displays the various system screen signals according to the priority level received via CAN communication
Rear view camera washer control unit	Controls the air pump to drive air to the rear camera lens according to the signals received from the ITS control unit
Rear view camera air pump motor	Drives air to the rear camera lens according to the signals received from the pump control unit

SYSTEM

System Description

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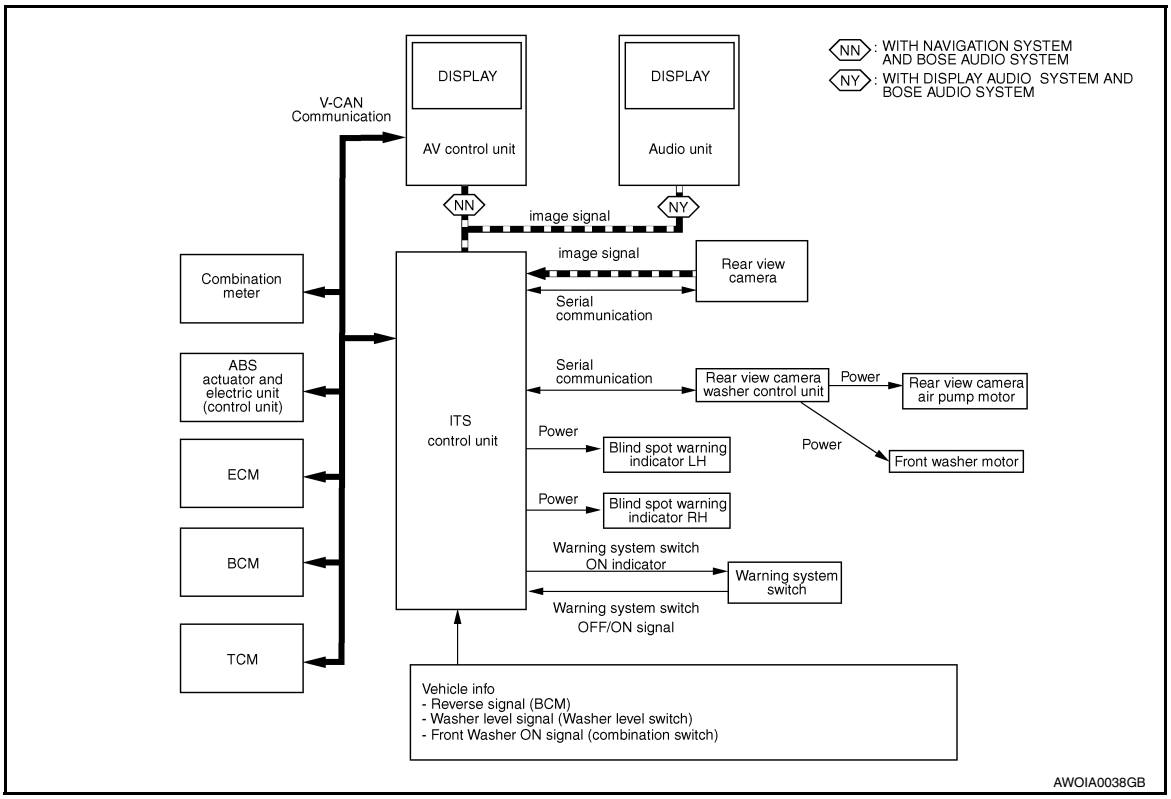
SYSTEM DIAGRAM



ITS CONTROL UNIT INPUT/OUTPUT SIGNAL ITEM

Input Signal Item

Transmit unit	Signal name		Description
ECM	CAN communication	Engine speed signal	Receives engine speed
TCM	CAN communication	Input speed signal	Receives the number of revolutions of input shaft
		Current gear position signal	Receives a current gear position
		Shift position signal	Receives a shift selector position
		Output shaft revolution signal	Receives the number of revolutions of output shaft
ABS actuator and electric unit (control unit)	CAN communication	Vehicle speed signal (ABS)	Receives wheel speeds of four wheels
		Yaw rate signal	Receives yaw rate acting on the vehicle
Combination meter	CAN communication	Parking brake switch signal	Receives an operational state of the parking brake
BCM	CAN communication	Front wiper request signal	Receives an operational state of front wiper(s)
		Turn indicator signal	Receives an operational state of the turn signal lamp and the hazard lamp
		Dimmer signal	Receives ON/OFF state of dimmer signal

Transmit unit	Signal name		Description
Steering angle sensor	CAN communication	Steering angle sensor malfunction signal	Receives a malfunction state of steering angle sensor
		Steering angle sensor signal	Receives the number of revolutions, turning direction of the steering wheel
		Steering angle speed signal	Receives the turning angle speed of the steering wheel
AV control unit (with navigation system and bose audio system)	CAN communication	System selection signal	Receives a selection state of each item in “Driver Assistance” selected with the navigation system
Audio unit (with display audio system and bose audio system)	System selection signal		Receives a selection state of each item in “Driver Assistance” selected with the display audio system
Warning systems switch	Warning systems switch signal		Receives an ON/OFF state of the warning systems switch

Output Signal Item

Reception unit	Signal name			Description
Combination meter	CAN communication	Meter display signal	Own vehicle indicator signal	Transmits a signal to display a state of the system on the information display
		Blind Spot Warning indicator		Transmits a Blind Spot Warning signal to turn ON the Blind Spot Warning indicator
		Lane Departure Warning lamp signal		Transmits a Lane Departure Warning signal to turn ON the Lane Departure Warning indicator
		Buzzer output signal		Transmits a buzzer output signal to turn ON the buzzer of the following systems: • Moving Object Detection (MOD) • Blind Spot Warning (BSW) • Lane Departure Warning (LDW)
Warning buzzer	Warning buzzer signal			Activates the warning buzzer of the following systems: • Moving Object Detection (MOD) • Blind Spot Warning (BSW) • Lane Departure Warning (LDW)
Warning systems ON indicator	Warning systems ON indicator signal			Turns ON the warning systems ON indicator

DESCRIPTION

• ITS* control unit controls the following systems, based on ITS communication signals from the rear view camera and a CAN communication signal from each control unit.

NOTE:

*: Intelligent Technology Suite

- Moving Object Detection (MOD)
- Blind Spot Warning (BSW)
- Lane Departure Warning (LDW)

System	Reference
Moving Object Detection (MOD)	DAS-228, "System Description"
Blind Spot Warning (BSW)	DAS-152, "System Description"
Lane Departure Warning (LDW)	DAS-77, "System Description"

Fail-safe (ITS Control Unit)

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If a malfunction occurs in each system, ITS control unit cancels each control, sounds a beep, and turns ON the warning lamp or indicator lamp.

System	Buzzer	Warning lamp/Indicator lamp	Description
Lane Departure Warning (LDW)	Low-pitched tone	Lane Departure Warning lamp	Cancel
Blind Spot Warning (BSW)	High-pitched tone	Blind Spot Warning lamp	Cancel
Moving Object Detection (MOD)	Low-pitched tone	Warning lamp MOD icon (on camera screen)	Cancel

DIAGNOSIS SYSTEM (ITS CONTROL UNIT)

CONSULT Function (AVM)

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CAUTION:
After disconnecting the CONSULT vehicle interface (VI) 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 performs the following functions via CAN communication using ITS control unit.

Diagnosis mode	Description
Self Diagnostic Result	Displays the name of a malfunctioning system stored in the ITS control unit
Data Monitor	Displays ITS control unit input/output data in real time
Work support	Displays causes of automatic system cancellation occurred during system control
Active Test	Enables an operational check of a load by transmitting a driving signal from the ITS control unit to the load
ECU identification	Displays ITS control unit part number
Configuration	The vehicle specification can be written when replacing the ITS control unit

SELF DIAGNOSTIC RESULT

Refer to DAS-20, "DTC Index".

DATA MONITOR

Monitored item [Unit]	Description
ST ANGLE SENSOR SIGNAL [On/Off]	Indicates [On/Off] status as judged from ITS control unit (Angle sensor transmits angle signal through CAN communication)
REVERSE SIGNAL [On/Off]	Indicates [On/Off] status as judged from ITS control unit (TCM transmits reverse signal through CAN communication)
VEHICLE SPEED SIGNAL [On/Off]	Indicates vehicle speed calculated from ITS control unit through CAN communication [ABS actuator and electric unit (control unit) transmits vehicle speed signal (wheel speed) through CAN communication]
CAMERA SWITCH SIGNAL [On/Off]	Indicates [On/Off] status of camera switch signal as judged from ITS control unit
CAMERA OFF SIGNAL [On/Off]	Indicates [On/Off] status of camera OFF signal as judged from ITS control unit
ST ANGLE SENSOR TYPE [Absolute/Not]	Indicates whether steering angle sensor type is absolute or not (ON means "controlling")
STEERING GEAR RATIO TYPE [Type 0/1]	Indicates the type of the steering gear ratio (type 1 or 2)
STEERING POSITION [LHD/RHD]	Indicates the steering position (LHD or RHD)
REAR CAMERA IMAGE SIGNAL [OK/Not]	Indicates the status of the rear camera image as read from ITS control unit through dedicated ITS communication lines
WASH SW [ON/OFF]	Indicates the state of the wash switch indicator output
R-CAMERA COMM STATUS [OK/Not]	Indicates the status of the rear camera communication status as read from ITS control unit through dedicated ITS communication lines
R-CAMERA COMM LINE [OK/Not]	Indicates the condition of the rear camera communication line whether transmitting properly through dedicated ITS communication lines
PUMP COMM STATUS [OK/NG]	Indicates the state of the communication signal from pump control unit

Monitored item [Unit]	Description
ILL [On/Off]	Indicates [On/Off] status of the illumination signal
ITS SW 1 [On/Off]	Indicates the state of the warning system switch as seen by the ITS control unit
ITS SW 1 IND [On/Off]	Indicates the state of the warning system switch indicator output
TURN SIGNAL [Left/N/Right]	Indicates [Left/N/Right] status of the turn signal output
ITS SW 2 [ON/OFF/No setting]	Indicates the state of the warning system secondary switch as seen by the ITS control unit
ITS SW 2 IND [ON/OFF/No setting]	Indicates the state of the warning system secondary switch indicator output

WORK SUPPORT

Work support items	Description
PREDICTIVE COURSE LINE DISPLAY	Setting whether predictive guide line displays or not
INITIALIZE CAMERA IMAGE CALIBRATION	Start the initialization process of the rear camera
STEERING ANGLE SENSOR ADJUSTMENT	Execute register neutral point of steering angle sensor
CALIBRATING CAMERA IMAGE (REAR CAMERA)	Displays the various values of the rear camera during the calibration process
REAR WIDE-VIEW FIXED GUIDE LINE CORRECTION	Adjustment the position of fixed guide line on rear wide view
REAR CAMERA ITS	Displays and sets camera image calibration values
CAUSE OF LDW CANCEL	Displays the information about reason of LDW cancellation
CAUSE OF BSW CANCEL	Displays the information about reason of BSW cancellation

ACTIVE TEST

CAUTION:

- **Never perform “Active Test” while driving the vehicle.**
- **The “Active Test” cannot be performed when the following systems warning indicators are illuminated:**
  - **Lane Departure Warning indicator**
  - **Blind Spot Warning indicator**
- **Place the shift selector to P (park) position, and then perform the test.**

Test item		Description
WASH ACTIVE	ON	Activates the washer to clean the lens of rear camera
	OFF	
LED LH INDICATOR	ON	Flashes the left side LED light for ITS system
	OFF	
LED RH INDICATOR	ON	Flashes the right side LED light for ITS system
	OFF	
AIR ACTIVE	ON	Activates the air pump to clean the lens of rear camera
	OFF	
AIR & WASH ACTIVE	ON	Activates the air pump and washer to clean the lens of rear camera
	OFF	

BSW ON INDICATOR

Test item	Operation	Description	Blind Spot Warning ON indicator lamp (Yellow)
BSW ON INDICATOR	Off	Stops transmitting the Blind Spot Warning ON indicator signal below to end the test	Off
	On	Transmits the Blind Spot Warning ON indicator signal to the warning lamp on the door	ON
Washer	Off	Stops transmitting activate signal to washer below to end the test	Off
	On	Transmits activate signal to washer	ON
Air pump	Off	Stops transmitting activate signal to air pump below to end the test	Off
	On	Transmits activate signal to air pump	ON

ECU IDENTIFICATION

ITS control unit part number is displayed.

CONFIGURATION

The specifications of the vehicle can be written and read in the ITS control unit when replaced.

ECU DIAGNOSIS INFORMATION

ITS CONTROL UNIT

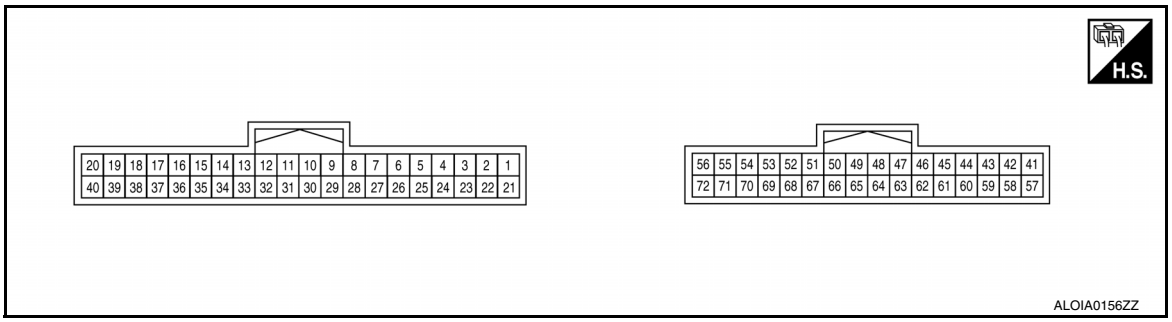
Reference Value

INFOID:0000000009464653

VALUES ON THE DIAGNOSIS TOOL

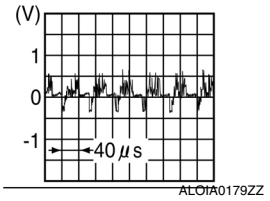
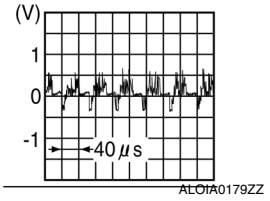
Monitor item	Condition		Value/Status
ST ANGLE SENSOR SIGNAL	Ignition switch ON	Steering angle signal is received	On
		Steering angle signal is not received	Off
REVERSE SIGNAL	Ignition switch ON	Shift selector in R (reverse)	On
		Shift selector is not in R (reverse)	Off
VEHICLE SPEED SIGNAL	While driving	Vehicle speed signal is received	On
		Vehicle speed signal is not received	Off
CAMERA SWITCH SIGNAL	Ignition switch ON	Camera switch is pressed	On
		Camera switch is not pressed	Off
CAMERA OFF SIGNAL	Ignition switch ON	Purpose switch is pressed	On
		Purpose switch is not pressed	Off
ST ANGLE SENSOR TYPE	Ignition switch ON	Steering angle sensor type is displayed	Absolute
		Steering angle sensor type is not received	Not
STEERING GEAR RATIO TYPE	Ignition switch ON	Pattern 1 type of steering gear ratio displayed	Pattern 1
		Pattern 2 type of steering gear ratio displayed	Pattern 2
STEERING POSITION	Ignition switch ON	It recognizes steering position is left	LHD
		It recognizes steering position is right	RHD
R-CAMERA COMM STATUS	Ignition switch ON	Rear camera serial status is OK	OK
		Rear camera serial status is not OK	NG
R-CAMERA COMM LINE	Ignition switch ON	Rear camera serial communication signal is received	OK
		Rear camera serial communication signal is not received	NG
ILL	Ignition switch ON	Illumination is ON	On
		Illumination is OFF	Off
ITS SW 1	Ignition switch ON	ITS switch is pressed	On
		ITS switch is not pressed	Off
ITS SW 1 IND	Ignition switch ON	Indicator of ITS switch 1 is lighting	On
		Indicator of ITS switch 1 is not lighting	Off
TURN SIGNAL	Ignition switch ON	Turn signal left is received	Left
		Turn signal neutral is received	N
		Turn signal right is received	Right
REAR CAMERA IMAGE SIGNAL	Ignition switch ON	Camera image signal is received	On
		Camera image signal is not received	Off
ITS SW 2	Ignition switch ON	For this vehicle, the displaying is fixed	No setting
ITS SW 2 IND	Ignition switch ON	For this vehicle, the displaying is fixed	No setting
WASH SW	Ignition switch ON	Wash switch signal is pressed	On
		Wash switch signal is not pressed	Off
PUMP COMM STATUS	Ignition switch ON	Pump communication signal is received	On
		Pump communication signal is not received	Off

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
1 (BR)	Ground	Washer level switch	Input	Ignition switch ON	When washer fluid is low (switch closed)	0 V
					When washer fluid is not low (switch open)	12 V
2 (G)	Ground	Washer signal pump to camera	Input	Ignition switch ON		5 V
3 (W)	Ground	Washer signal camera to pump	Output	Ignition switch ON		5 V
7 (P)	Ground	CAN -L	—	—	—	—
17 (G)	Ground	SOW LED signal R	Output	While driving	LDW/BSW detected	12 V
					LDW/BSW is not detected	0 V
20 (G)	Ground	Battery supply	Input	—	—	12 V
22 (P)	Ground	Serial ground	Output	—	—	0 V
27 (L)	Ground	CAN -H	—	—	—	—
28 (R)	Ground	Reverse	Input	Ignition switch ON	Shift selector in R (reverse)	12 V
					Shift selector not in R (reverse)	0 V
32 (P)	Ground	Cancel SW output	Input	Ignition switch ON	Cancel switch pressed	0 V
					Cancel switch not pressed	12 V
33 (BG)	Ground	LED input	Output	Ignition switch ON	Warning system is ON	12 V
					Warning system is OFF	0 V
37 (W)	Ground	SOW LED signal L	Output	While driving	LDW/BSW detected	12 V
					LDW/BSW is not detected	0 V
39 (BG)	Ground	Ignition power supply	Input	Ignition switch ON		Battery Voltage
40 (B)	Ground	Ground	—	—	—	0 V
50, 53	Ground	Shield	—	—	—	0 V
51 (R)	Ground	RR CAM GND	Output	Ignition switch ON	—	0 V

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	–	Signal name	Input/ Output		
52 (W)	Ground	RR CAM ON	Output	Ignition switch ON	6 V
66 (B)	Ground	RR CAM COMP +	Input	Ignition switch ON	 ALOIA0179ZZ
68 (G)	Ground	RR CAM CONT	Input	Ignition switch ON	5 V
69 (B)	Ground	RR CAM COMP +	Input	Ignition switch ON	 ALOIA0179ZZ

Fail-safe

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If a malfunction occurs in each system, ITS control unit cancels each control, sounds a beep, and turns ON the warning lamp or indicator lamp.

System	Buzzer	Warning Indicator lamp	Description
Lane Departure Warning (LDW)	Low-pitched tone	Lane Departure Warning lamp	Cancel
Blind Spot Warning (BSW)	High-pitched tone	Blind Spot Warning lamp	Cancel
Moving Object Detection (MOD)	Low-pitched tone	Warning lamp MOD icon (on camera screen)	Cancel

DTC Inspection Priority Chart

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If multiple DTCs are detected simultaneously, check them one by one depending on the following DTC inspection priority chart.

Priority	Detected items (DTC)
1	• U1000: CAN COMM CIRCUIT • U1010: CONTROL UNIT (CAN)
2	• U1305: CAMERA IMAGE CALIB • U1308: CAMERA CONFIG
3	• C1A39: STRG SEN CIR • U0428: STRG SEN CAN CIR 2 • U111A: REAR CAMERA IMAGE SIGNAL • U1232: ST ANGLE SEN CALIB • U1309: PUMP UNIT CURRENT • U130B: REAR CAMERA COMM ERROR • U1310: PUMP UNIT CIRCUIT
4	• C1A03: VHCL SPEED SE CIRC • C1A04: VDC FAIL • U0122: VDC P-RUN DIAG • U0416: VDC CHECKSUM DIAG

DTC Index

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NOTE:
- The details of time display are as follows:
- CRNT: A malfunction is detected now
- PAST: A malfunction was detected in the past
- IGN counter is displayed on FFD (Freeze Frame Data).
- 0: The malfunctions that are detected now
  CAN communication system (U1000, U1010)
- 1 - 39: It increases like 0 → 1 → 2 ··· 38 → 39 after returning to the normal condition whenever the ignition switch OFF → ON. It returns to 0 when a malfunction is detected again in the process.
- If it is over 39, it is fixed to 39 until the self-diagnosis results are erased.
  Other than CAN communication system (Other than U1000, U1010)
- 1 - 49: It increases like 0 → 1 → 2 ··· 38 → 49 after returning to the normal condition whenever the ignition switch OFF → ON. It returns to 0 when a malfunction is detected again in the process.
- If it is over 49, it is fixed to 49 until the self-diagnosis results are erased.

Systems for fail-safe
- A: Lane Departure Warning (LDW)
- B: Blind Spot Warning (BSW)
- C: Moving Object Detection (MOD)

DTC		Warning lamp			Fail-safe	
CONSULT	CONSULT display	Lane Departure Warning	Blind Spot Warning	Moving Object Detection	System	Reference
C1A03	VHCL SPEED SE CIRC	ON	ON	ON	A, B, C	DAS-42
C1A04	VDC FAIL	ON	ON	ON	A, B, C	DAS-43
C1A39	STRG SEN CIR	ON	ON	ON	A, B, C	DAS-44
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED	NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED	—	—	—	—	—
U0122	VDC P-RUN DIAG	ON	ON	ON	A, B, C	DAS-45
U0416	VDC CHECKSUM DIAG	ON	ON	ON	A, B, C	DAS-46
U0428	STRG SEN CAN CIR 2	ON	ON	ON	A, B, C	DAS-47
U1000[NOTE]	CAN COMM CIRCUIT	ON	ON	ON	A, B, C	DAS-48
U1010	CONTROL UNIT (CAN)	ON	ON	ON	A, B, C	DAS-49
U111A	REAR CAMERA IMAGE SIGNAL	ON	ON	ON	A, B, C	DAS-50
U1232	ST ANGLE SEN CALIB	ON	ON	ON	A, B, C	DAS-52
U1305	CAMERA IMAGE CALIB	ON	ON	ON	A, B, C	DAS-53
U1308	CAMERA CONFIG	ON	ON	ON	A, B, C	DAS-54
U1309	PUMP UNIT CURRENT	ON	ON	ON	A, B, C	DAS-55
U130B	REAR CAMERA COMM ERROR	ON	ON	ON	A, B, C	DAS-58
U1310	PUMP UNIT CIRCUIT	ON	ON	ON	A, B, C	DAS-59

NOTE:
With the detection of “U1000” some systems do not perform the fail-safe operation.

A system controlling based on a signal received from the control unit performs fail-safe operation when the communication with the ITS control unit becomes inoperable.

WIRING DIAGRAM

DRIVER ASSISTANCE SYSTEMS

Wiring Diagram

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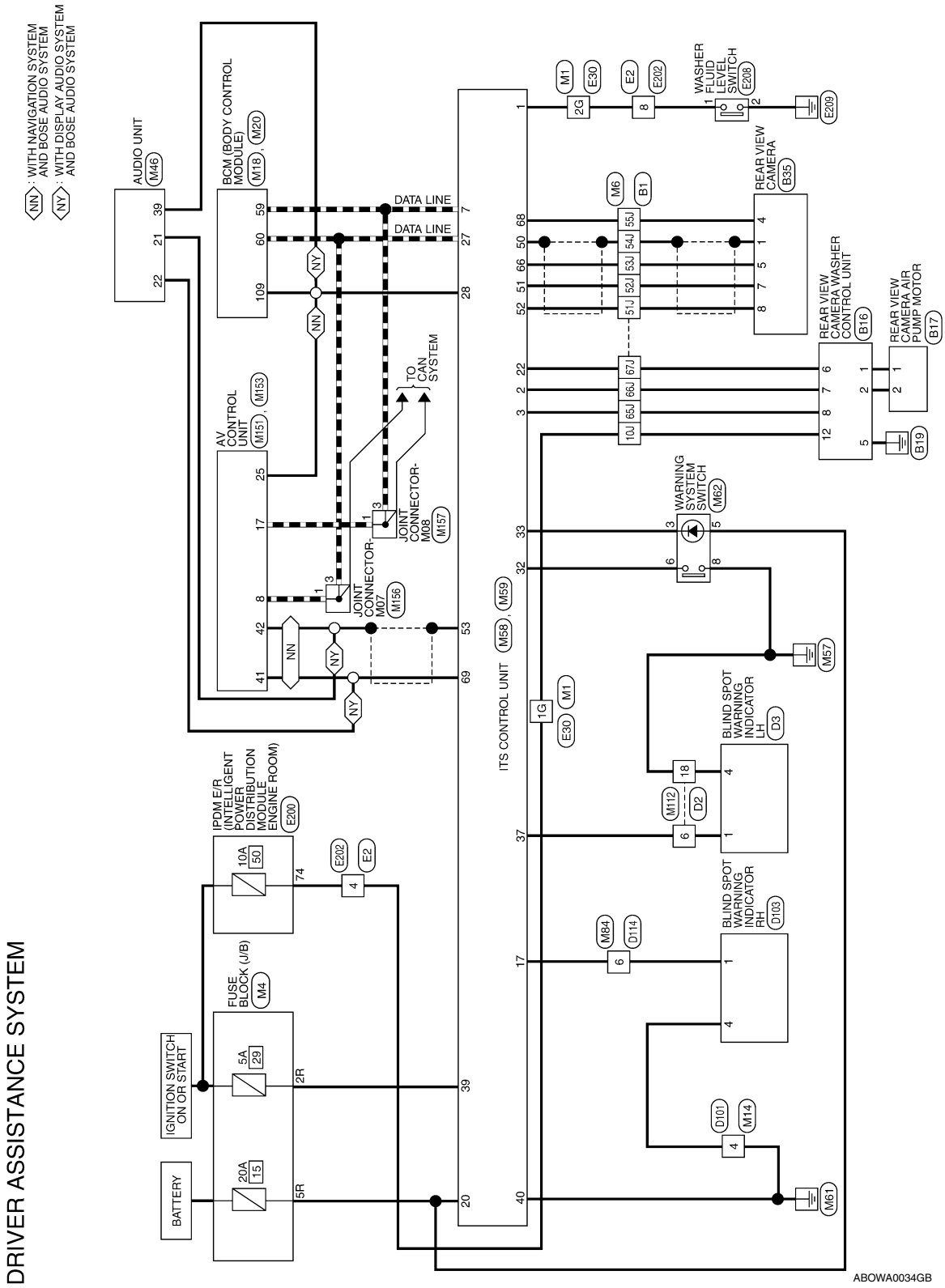
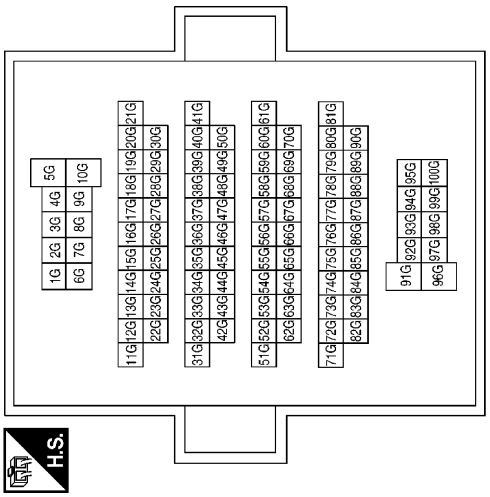


DRIVER ASSISTANCE SYSTEM CONNECTORS

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

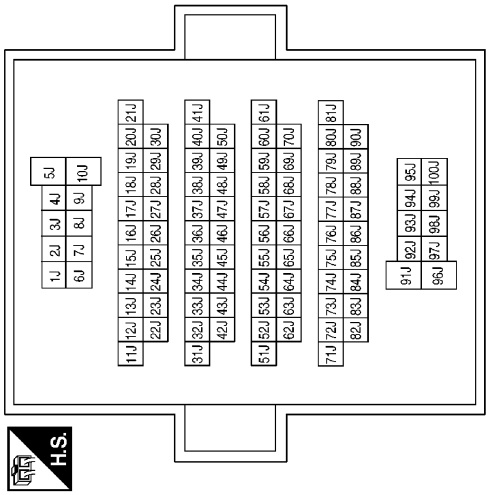


Terminal No.	Color of Wire	Signal Name
1G	LG	–
2G	BR	–

Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Color	BROWN

Terminal No.	Color of Wire	Signal Name
2R	BG	–
5R	G	–

Connector No.	M6
Connector Name	WIRE TO WIRE
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
10J	LG	–
51J	W	–
52J	R	–
53J	B	–
54J	SHIELD	–
55J	G	–
65J	W	–
66J	G	–
67J	P	–

ABOIA0115GB

Connector No.	M14
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1	2		3
4	5	6	7	8

Terminal No.	Color of Wire	Signal Name
4	GR	–

Connector No.	M18
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	BLACK

H.S.

60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41
80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64	63	62	61

Terminal No.	Color of Wire	Signal Name
59	P	CAN-L
60	L	CAN-H

Connector No.	M20
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	BLACK

H.S.

116	115	114	113	112	111	110	109	108	107	106	105
128	127	126	125	124	123	122	121	120	119	118	117

Terminal No.	Color of Wire	Signal Name
109	G	REVERSE SIGNAL

Connector No.	M46
Connector Name	AUDIO UNIT (WITH DISPLAY AUDIO SYSTEM AND BOSE AUDIO SYSTEM)
Connector Color	WHITE

H.S.

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52

Terminal No.	Color of Wire	Signal Name
21	SHIELD	COMPOSITE -
22	B	COMPOSITE +
39	G	REVERSE

ABOIA0116GB

Connector No.	M58
Connector Name	ITS CONTROL UNIT
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
1	BR	WASH LVL SW
2	G	FROM PUMP TO CAMERA C/U
3	W	FROM CAMERA C/U TO PUMP
4	–	–
5	–	–
6	–	–

Terminal No.	Color of Wire	Signal Name
7	P	CAN-L
8	–	–
9	–	–
10	–	–
11	–	–
12	–	–
13	–	–
14	–	–
15	–	–
16	–	–
17	G	SOW LED SIGNAL R
18	–	–
19	–	–
20	G	B+
21	–	–
22	P	SERIAL GND
23	–	–

Terminal No.	Color of Wire	Signal Name
24	–	–
25	–	–
26	–	–
27	L	CAN-H
28	R	REV
29	–	–
30	–	–
31	–	–
32	P	CANCEL SW OUTPUT
33	BG	LED INPUT
34	–	–
35	–	–
36	–	–
37	W	SOW LED SIGNAL L
38	–	–
39	BG	IGN
40	B	GND

Connector No.	M59
Connector Name	ITS CONTROL UNIT
Connector Color	WHITE

H.S.

56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41
72	71	70	69	68	67	66	65	64	63	62	61	60	59	58	57

Terminal No.	Color of Wire	Signal Name
41	–	–
42	–	–
43	–	–
44	–	–
45	–	–

Terminal No.	Color of Wire	Signal Name
46	–	–
47	–	–
48	–	–
49	–	–
50	SHIELD	–
51	R	RR CAM GND
52	W	RR CAM ON
53	SHIELD	–
54	–	–
55	–	–
56	–	–
57	–	–
58	–	–

Terminal No.	Color of Wire	Signal Name
59	–	–
60	–	–
61	–	–
62	–	–
63	–	–
64	–	–
65	–	–
66	B	RR CAM COMP +
67	–	–
68	G	RR CAM CONT
69	B	COMP OUT +
70	–	–
71	–	–
72	–	–

AAOIA0042GB

Connector No.	M62
Connector Name	WARNING SYSTEM SWITCH
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
3	BG	–
5	G	–
6	P	–
8	B	–

Connector No.	M84
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
6	G	–

Connector No.	M112
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
6	W	–
18	B	–

Connector No.	M151
Connector Name	AV CONTROL UNIT (WITH NAVIGATION SYSTEM WITH BOSE AUDIO SYSTEM)
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
8	L	CAN-H
17	P	CAN-L

Connector No.	M153
Connector Name	AV CONTROL UNIT (WITH NAVIGATION SYSTEM WITH BOSE AUDIO SYSTEM)
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
25	G	REVERSE
41	B	CAMERA +
42	SHIELD	CAMERA - (SHIELD)

Connector No.	M156
Connector Name	JOINT CONNECTOR-M07
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	L	–
3	L	–

ABOIA0117GB

Connector No.	M157
Connector Name	JOINT CONNECTOR-M08
Connector Color	WHITE

H.S.

4	3	2	1	0

Terminal No.	Color of Wire	Signal Name
1	P	–
3	P	–

Connector No.	E2
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1	2	3
4	5	6	7	8

Terminal No.	Color of Wire	Signal Name
4	BG	– (WITH REAR VIEW CAMERA)
8	R	–

Connector No.	E30
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1G	BG	– (WITH REAR VIEW CAMERA)
2G	R	–

Connector No.	E200
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE

H.S.

74	75	76
77	78	79	80	81

Terminal No.	Color of Wire	Signal Name
74	BG	WASH MTR (WITH REAR VIEW CAMERA)

ABOIA0118GB

Connector No.	E202
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
4	BG	– (WITH REAR VIEW CAMERA)
8	R	–

Connector No.	E208
Connector Name	WASHER FLUID LEVEL SWITCH
Connector Color	BLACK

H.S.

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

Connector No.	B1
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
10J	W	–
51J	W	–
52J	B	–
53J	R	–
54J	SHIELD	–
55J	G	–
65J	W	–
66J	G	–
67J	P	–

Connector No.	B16
Connector Name	REAR VIEW CAMERA WASHER CONTROL UNIT
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	V	PUMP MOTOR +
2	BR	PUMP MOTOR -
5	B	GND
6	P	SERIAL GND
7	G	FROM PUMP TO CAMERA C/U
8	W	FROM CAMERA C/U TO PUMP
12	W	IGN

ABOIA0119GB

Connector No.	B17
Connector Name	REAR VIEW CAMERA AIR PUMP MOTOR
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	V	–
2	BR	–

Connector No.	B35
Connector Name	REAR VIEW CAMERA
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	SHIELD	–
4	G	–
5	R	–
7	B	–
8	W	–

Connector No.	D2
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
6	P	–
18	B	–

Connector No.	D3
Connector Name	BLIND SPOT WARNING INDICATOR LH
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	P	–
4	B	–

Connector No.	D101
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
4	B	–

Connector No.	D103
Connector Name	BLIND SPOT WARNING INDICATOR RH
Connector Color	WHITE

H.S.

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

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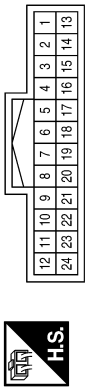
Connector No.	D114
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
6	R	–

ABOIA0121GB

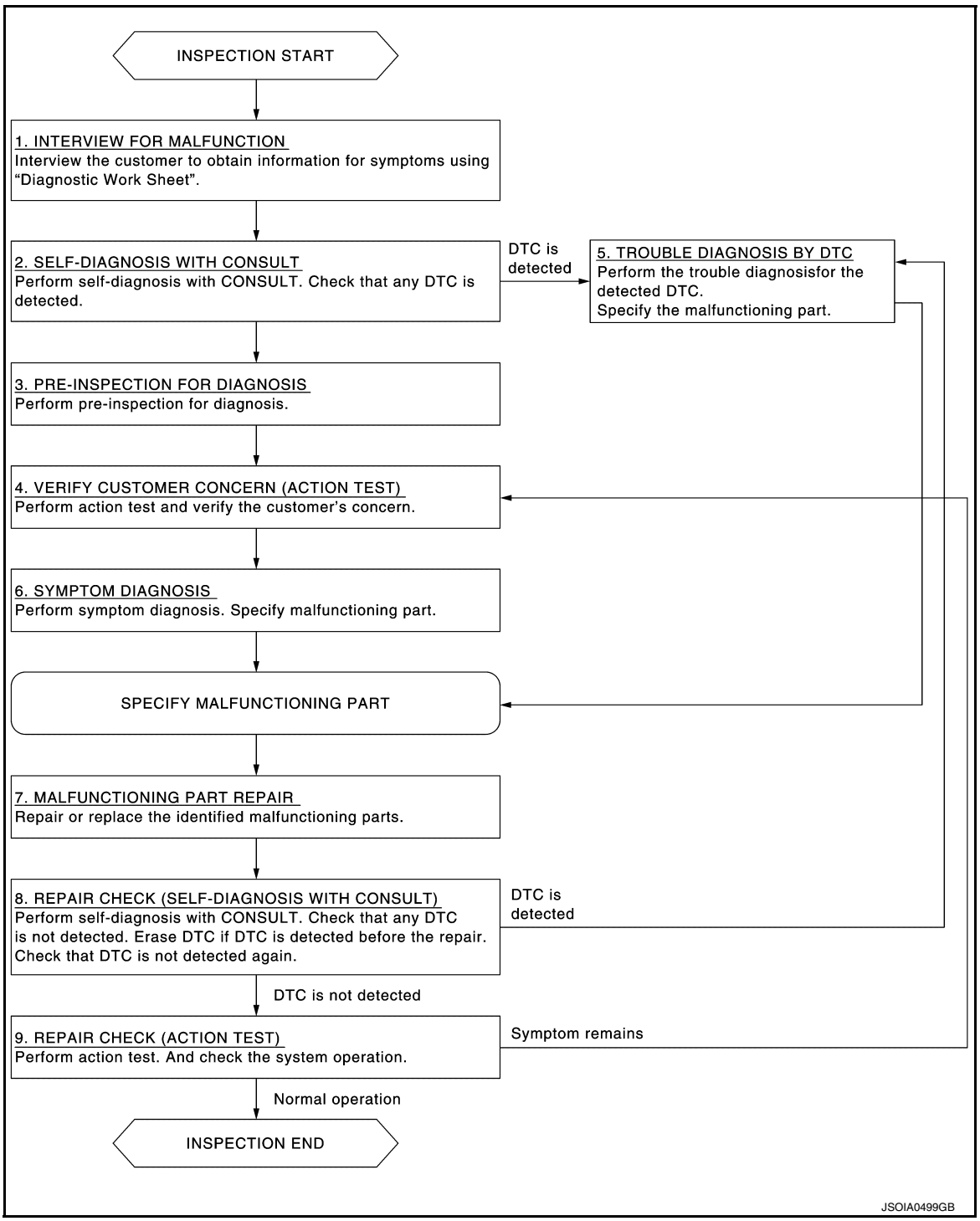
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000009464658

OVERALL SEQUENCE



DETAILED FLOW

1.INTERVIEW FOR MALFUNCTION

Interview the customer to obtain information about symptoms using “Diagnostic Work Sheet”. (Refer to DAS-32, "Diagnostic Work Sheet".)

>> GO TO 2.

2.SELF-DIAGNOSIS WITH CONSULT

1. Perform “All DTC Reading” with CONSULT.
2. Check if the DTC is detected on the self-diagnosis results of “AVM”.

Is any DTC detected?

YES >> GO TO 5.
NO >> GO TO 3.

3.PRE-INSPECTION FOR DIAGNOSIS

Perform pre-inspection for diagnosis. Refer to DAS-34, "Inspection Procedure".

>> GO TO 4.

4.ACTION TEST

Perform LDW system action test to check the operation status. Refer to DAS-35, "Description".

>> GO TO 6.

5.TROUBLE DIAGNOSIS BY DTC

Perform trouble diagnosis for the detected DTC. Specify a malfunctioning part. Refer to DAS-20, "DTC Index" (ITS CONTROL UNIT).

>> GO TO 7.

6.SYMPTOM DIAGNOSIS

Perform symptom diagnosis. Specify malfunctioning part. Refer to DAS-137, "Symptom Table".

>> GO TO 7.

7.MALFUNCTION PART REPAIR

Repair or replace the identified malfunctioning parts.

>> GO TO 8.

8.REPAIR CHECK (SELF-DIAGNOSIS WITH CONSULT)

Perform self-diagnosis with CONSULT. Check that any DTC is not detected. Erase DTC if DTC is detected before the repair. Check that DTC is not detected again.

Is any DTC detected?

YES >> GO TO 5.
NO >> GO TO 9.

9.REPAIR CHECK (ACTION TEST)

Perform LDW system action test. Also check the system operation.

Does it operate normally?

YES >> Inspection End.
NO >> GO TO 4.

Diagnostic Work Sheet

INFOID:0000000009464659

DESCRIPTION

In general, each customer feels differently about an incident. It is important to fully understand the symptoms or conditions for a customer complaint.
There are many operating conditions that lead to the malfunction. A good grasp of such conditions can make troubleshooting faster and more accurate.
Some conditions may cause the lane departure warning lamp to stay ON.

Utilize a work sheet sample to organize all of the information for troubleshooting.

KEY POINTS
- WHAT..... System and functions
- WHEN..... Date, Frequencies
- WHERE..... Road conditions
- HOW..... Operating conditions, Symptoms

WORK SHEET SAMPLE

Customer name MR/MS	Model and Year	VIN
Engine #	Trans.	Mileage
Incident Date	Manuf. Date	In Service Date

Symptoms			
Indicator/Warning lamps	☐ Lane departure warning lamp	☐ Stays ON ☐ Turned ON occasionally	☐ Stays OFF ☐ Others ( ) ☐ Blinks
	☐ Warning systems ON indicator	☐ Stays ON	☐ Stays OFF ☐ Others ( ) ☐ Blinks
	☐ Other lamps ( )	☐ Stays ON ☐ Turned ON occasionally	☐ Stays OFF ☐ Others ( ) ☐ Blinks
Functions	☐ When using LDW		
	☐ All functions do not operate. ☐ Warning function does not operate. (☐ No sound ☐ No indicator) ☐ Yawing function does not operate. (Warning function is operated.) ☐ Functions when changing the course in the turn signal direction. ☐ Functions are untimely. ☐ Does not function when driving on lane markers. ☐ Functions when driving in a lane. ☐ Functions in a different position from the actual position. ☐ Others ( )		

Conditions			
Frequency	☐ Continuously	☐ Intermittently	
Light conditions	☐ Not affected ☐ In the daytime ☐ Direct light	☐ At night ☐ Backlight	☐ Sunrise/sunset (Strong light) ☐ Others ( )
Driving conditions	☐ Not affected ☐ Vehicle speed	MPH (km/h)	☐ Vehicle is stopped
Weather conditions	☐ Not affected ☐ Fine ☐ Clouding	☐ Raining	☐ Snowing ☐ Others ( )
Road conditions	☐ Not affected ☐ Highway ☐ Uneven roads	☐ In town ☐ Winding roads	☐ Others ( )
Lane maker conditions	☐ Not affected ☐ Clear	☐ Unclear	☐ Others ( )
Other conditions			

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PRE-INSPECTION FOR DIAGNOSIS

Inspection Procedure

INFOID:0000000009464660

1.CHECK CAMERA LENS

Is camera lens contaminated with foreign materials?

YES >> Clean camera lens.
NO >> GO TO 2.

2.CHECK REAR VIEW CAMERA UNIT INSTALLATION CONDITION

Check rear view camera unit installation condition (installation position, properly fitted).

Is it properly installed?

YES >> GO TO 3.
NO >> Install rear view camera unit properly, and perform rear view camera calibration. Refer to DAS-38, "Description".

3.CHECK VEHICLE HEIGHT

Check vehicle height. Refer to FSU-26, "Wheelarch Height (Unladen*1)".

Is vehicle height appropriate?

YES >> Inspection End.
NO >> Repair vehicle to appropriate height.

ACTION TEST

Description

INFOID:0000000009464661

- Perform action test to verify the customer's concern.
- Perform action test and check the system operation after system diagnosis.

WARNING:
Be careful of traffic conditions and safety around the vehicle when performing road test.
CAUTION:
• Fully understand the following items well before the road test;
- Precautions: Refer to DAS-73, "Precaution for LDW System Service".
- System description for LDW: Refer to DAS-77, "System Description".
- System description for BSW: Refer to DAS-152, "System Description".
- System description for MOD: Refer to DAS-228, "System Description".
- Handling precaution: Refer to DAS-82, "Precautions for Lane Departure Warning".

Inspection Procedure

INFOID:0000000009464662

WARNING:
Be careful of traffic conditions and safety around the vehicle when performing road test.
CAUTION:
• Fully understand the following items well before the road test;
- Precautions: Refer to DAS-73, "Precaution for LDW System Service".
- System description for LDW: Refer to DAS-77, "System Description".
- System description for BSW: Refer to DAS-152, "System Description".
- System description for MOD: Refer to DAS-228, "System Description".
- Handling precaution: Refer to DAS-232, "Precautions for Moving Objects Detection".

1.CHECK LDW SYSTEM SETTING

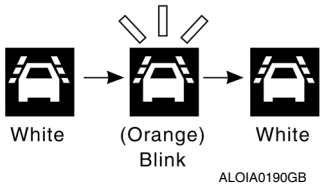
1. Start the engine.
2. Check that the LDW system setting can be enabled/disabled on the vehicle information display.
3. Turn OFF the ignition switch and wait for 30 seconds or more.
4. Check that the previous setting is saved when the engine starts again.

>> GO TO 2.

2.ACTION TEST FOR LDW

1. Enable the setting of the LDW system on the vehicle information display.
2. Turn warning systems switch ON (warning systems ON indicator is ON).
3. Check the LDW operation according to the following table.

Vehicle condition/ Driver's operation		Action	Warning systems ON indicator	Indication on the combination meter	Buzzer
Less than Approx. 60 km/h (40 MPH)	Close to lane marker	No action	ON	 White ALOIA0191GB	—

Vehicle condition/ Driver's operation		Action	Warning systems ON indicator	Indication on the combination meter	Buzzer
Approx. 70 km/h (45 MPH) or more	Close to lane marker	Warning • Buzzer sounds • Warning lamp blinks	ON		Short continuous beeps
	• Close to lane marker • Turn signal ON (Deviate side)	No action	ON		—

NOTE:
After the operating conditions of warning are satisfied, the warning continues until the vehicle speed reaches approximately 60 km/h (40 MPH). Refer to DAS-77, "System Description".

>> Inspection End.

ADDITIONAL SERVICE WHEN REPLACING REAR VIEW CAMERA

Description

INFOID:0000000009464663

Always perform the calibration after removing and installing or replacing the rear view camera.

CAUTION:

The system does not operate normally unless the rear view camera aiming adjustment is performed. Always perform it.

Work Procedure

INFOID:0000000009464664

1.CAMERA AIMING ADJUSTMENT

Perform the camera aiming adjustment with CONSULT. Refer to DAS-38, "Description".

>> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

Perform the self-diagnosis of rear view camera with CONSULT. Check if any DTC is detected.

Is any DTC detected?

YES >> Perform the trouble diagnosis for the detected DTC. Refer to DAS-20, "DTC Index".
NO >> GO TO 3.

3.LDW/BSW SYSTEM ACTION TEST

1. Perform the LDW/BSW system action test. Refer to DAS-35, "Description".
2. Check that the LDW/BSW system operates normally.

Is the inspection result normal?

YES >> Inspection End.
NO >> GO TO 4.

4.LDW/BSW ACTIVE TEST

1. Perform WASH ACTIVE on Active Test using CONSULT.
2. Perform air and washer tube connection check by AIR & WASH ACTIVE on Active Test:

(1) Washer fluid output count on the rear view camera is 3 to 5 times → OK
(2) Washer fluid output count on the rear view camera is 10 times → Check tube with yellow marking
(3) Washer fluid output count on the rear view camera is 1 time → Check tube with green marking
(4) No washer fluid output → Check tube with blue marking or check valve

>> Inspection End.

REAR VIEW CAMERA CALIBRATION

Description

INFOID:0000000009464665

Always perform the calibration after removing and installing or replacing the rear view camera.

CAUTION:

- **Place the vehicle on level ground when the calibration is performed.**
- **Follow the CONSULT when performing the calibration. (Rear view camera calibration cannot be operated without CONSULT).**

Work Procedure (Preparation)

INFOID:0000000009464666

1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis of the ITS control unit.

Is any DTC detected?

Except "U1308">> Perform diagnosis on the detected DTC and repair or replace the applicable item. Refer to DAS-20, "DTC Index".

"U1308" or no DTC>> GO TO 2.

2.PREPARATION BEFORE REAR VIEW CAMERA CALIBRATION

NOTE:

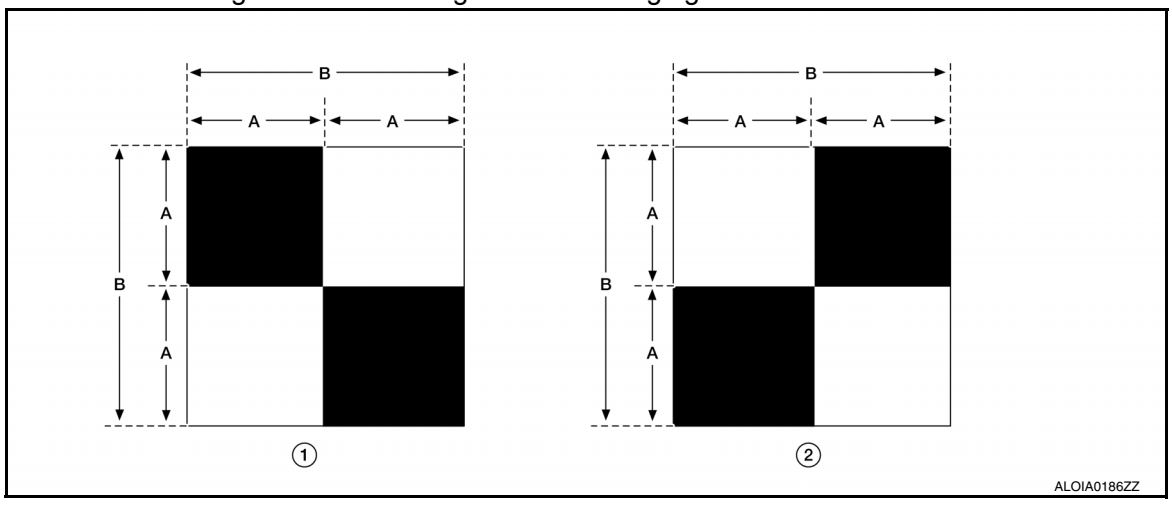
Select the "AVM" to diagnose the ITS control unit by CONSULT.

1. Perform pre-inspection for diagnosis. Refer to DAS-34, "Inspection Procedure".
2. Adjust the tire pressure to the specified pressure value.
3. Maintain no-load in vehicle.
4. Check if coolant and engine oil are filled up to correct level and fuel tank is full.
5. Situate vehicle where the camera is exposed at an atmosphere temperature between 0°C (32°F) and 30°C (86°F)
6. Move the shift selector to P (Park) and release the parking brake.
7. Clean the rear view camera.

>> GO TO 3.

3.PREPARATION OF CALIBRATION TARGET MARK

Prepare the calibration target mark according to the following figure:



(1) : Left and right targets

(2) : Center target

(A) : Side of the black or white area = 200 mm (7.87 in)

(B) : Side of the square target = 400 mm (15.75 in)

>> Refer to DAS-39, "Work Procedure (Target Setting)".

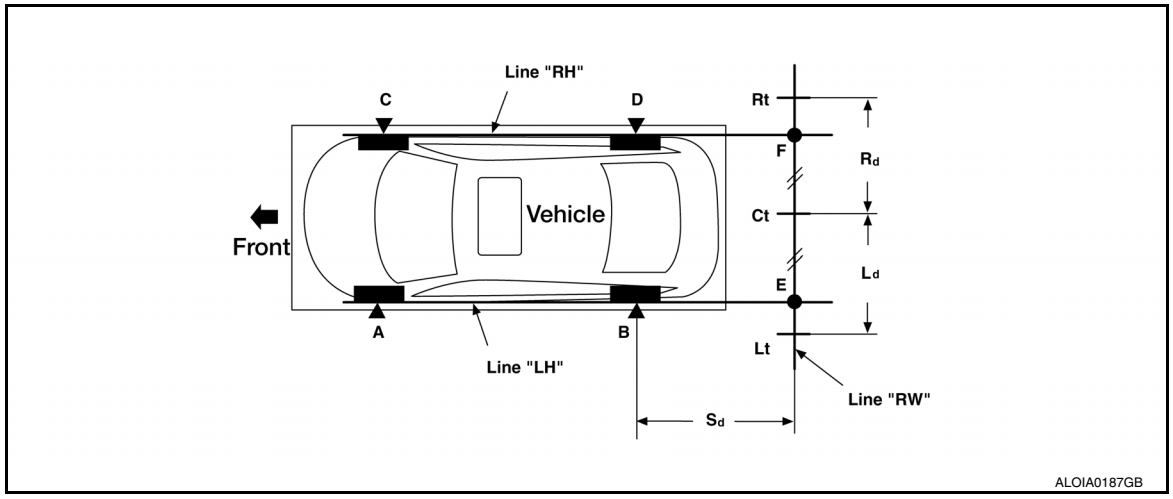
Work Procedure (Target Setting)

INFOID:0000000009464667

CAUTION:

- **Perform this operation in a horizontal position where there is a clear view for 3 m (9.84 ft) backward and 4 m (13.12 ft) wide.**
- **Place the target in a well-lighted location. (Poor lighting may make it hard to adjust.)**
- **The target may not be detected when it shines by the reflected light of the sun or lighting.**
- **The target may not be detected when there is the same pattern of black and white as the target when the pattern is within 0.5 m (1.64 ft) from either side and upward/downward position from the target. (It is desirable that the vehicle is positioned on a single-color floor.)**

1. TARGET SETTING

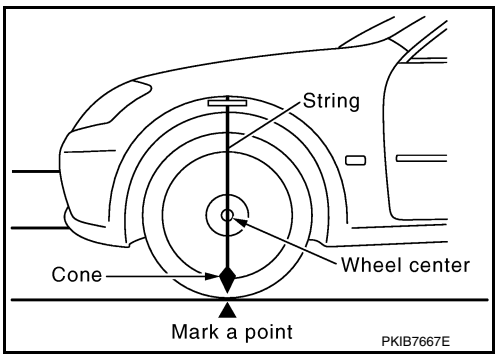


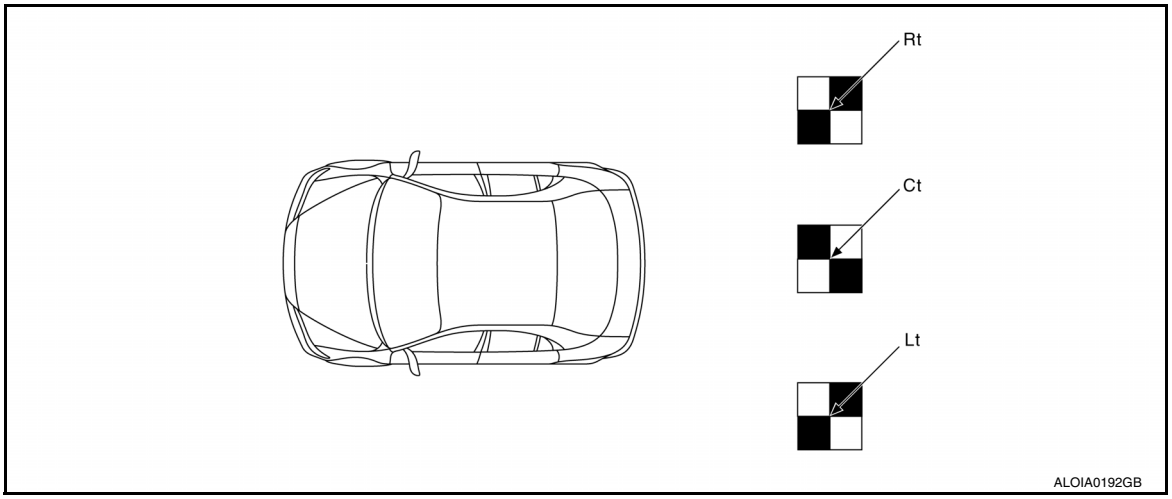
Side distance (S_d): "B" – "E" ("D" – "F") : 2125 mm (83.66 in)

Left distance (L_d): "Ct" – "Lt" : 1500 mm (59.06 in)

Right distance (R_d): "Ct" – "Rt" : 1500 mm (59.06 in)

1. Mark points "A", "B", "C" and "D" at the center of the lateral surface of each wheel.
   NOTE:
   Hang a string with a cone from the fender so as to pass through the center of wheel, and then mark a point at the center of the lateral surface of the wheel.
2. Draw line "LH" passing through points "A" and "B" on the left side of vehicle.
   NOTE:
   Approximately 2.2 m (7.22 ft) or more at the rear from the rear axle.
3. Mark point "E" on the line "LH" at the positions 2125 mm (83.66 in) from point "B".
4. Draw line "RH" passing through points "C" and "D" on the right side of vehicle in the same way as step 2.
5. Mark point "F" on the line "RH" at the positions 2125 mm (83.66 in) from point "D".
6. Draw line "RW" passing through the points "E" and "F" on the rear of the vehicle.
   NOTE:
   Approximately 1.8 m (5.91 ft) or more at both left and right sides from vehicle center.
7. Mark point "Ct" at the center of point "E" and "F" on the line "RW".
   CAUTION:
   Make sure that "E" to "Ct" is equal to "F" to "Ct".
8. Mark point "Lt" and "Rt" on the line "RW" at the positions 1500 mm (59.06 in) from point "Ct".
9. Position the center of the target mark to point of "Ct".





CAUTION:
Make sure that the black/white pattern of the center target is rotated as compared with the left and right targets.

>> Go to DAS-40, "Work Procedure (Rear View Camera Calibration)".

Work Procedure (Rear View Camera Calibration)

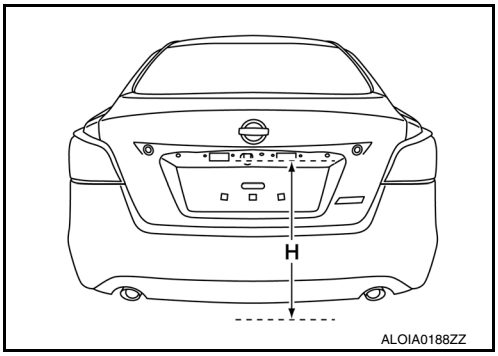
INFOID:0000000009464668

CAUTION:
Perform the calibration under the specified vehicle condition (fuel full, no-load, specified tire pressure, etc.). Refer to DAS-38, "Work Procedure (Preparation)".

1.CHECK REAR VIEW CAMERA HEIGHT

Measure the rear view camera height “H”.

>> GO TO 2.



2.REAR VIEW CAMERA CALIBRATION

1. Select “Work Support” on “AVM” with CONSULT.
2. Select “REAR CAMERA ITS”.
3. Select "OK".
   CAUTION:
   - **Perform the calibration after the ignition or engine has been kept on for at least 10 minutes to stabilize camera.**
   - **Operate CONSULT outside the vehicle, and close all doors to retain appropriate vehicle altitude.**
4. Input the rear view camera height "H", and then touch "APPLY".
5. Confirm that the same value is displayed on the center display.
6. Confirm the following items:

- The target should be accurately placed.
- The vehicle should be stopped.
- The vehicle should be under the specified vehicle condition.

7. Select “Start” to perform calibration.
8. Confirm the displayed item.

- “Completed”: Select “Completion”.
- Otherwise, perform the following services:

Displayed item		Possible cause	Service procedure
SUSPENSION	—	Temporary malfunction in internal processing of the rear view camera.	Go back to Step 1
	00H Routine not activated	Rear view camera unit malfunction.	Position the target appropriately again. Perform the aiming again. Refer to DAS-39, "Work Procedure (Target Setting)".
	10H Writing error	• Temporary malfunction in internal processing of the rear view camera. • Rear view camera malfunction.	
X AIMING NG Y (X: 0 - 7, Y: 1 - 8)	—	• A target is not-yet-placed. (The rear view camera cannot detect a target.) • The position of the rear view camera is not correct. • Inappropriate work environment. • Inappropriate vehicle condition.	Position the target appropriately again. Perform the aiming again. Refer to DAS-38, "Work Procedure (Preparation)".
ABNORMALLY COMPLETED	—		

NOTE:
Replace camera unit if “00H Routine not activated” or “10H Writing error” are repeatedly indicated during the above two services are performed.

9. Confirm that “Completed” is displayed and then select “End” to close the calibration procedure.

>> GO TO 3.

3. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis of ITS control unit with CONSULT.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the applicable item. Refer to DAS-20, "DTC Index".

NO >> GO TO 4.

4. ACTION TEST

Test the system operation by action test. Refer to DAS-35, "Description".

>> Work End.

DTC/CIRCUIT DIAGNOSIS

C1A03 VEHICLE SPEED SENSOR

DTC Logic

INFOID:0000000009464669

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
C1A03	VHCL SPEED SEN CIRC	ITS control unit detects that the result of calculation about velocity has error.	• ABS actuator and electric unit (control unit) • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the "C1A03" is detected as the current malfunction in "Self Diagnostic Result" of "AVM".

Is “C1A03” detected as the current malfunction?

YES >> Refer to DAS-42, "Diagnosis Procedure".
NO >> Refer to GI-43, "Intermittent Incident".

Diagnosis Procedure

INFOID:0000000009464670

1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts. Refer to BRC-45, "DTC Index".
NO >> GO TO 2.

2.CHECK ALL UNIT SELF-DIANOSIS RESULTS

Check if any DTC is detected except for ITS control unit about VDC in "ALL DTC READING" with CONSULT.

Is any DTC detected except for ITS?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-128, "Removal and Installation".
NO >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".

C1A04 ABS/TCS/VDC SYSTEM

DTC Logic

INFOID:0000000009464671

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
C1A04	VDC CIRCUIT	ITS control unit receives the message that means "VDC is failed" from ABS actuator and electric unit (control unit).	• ABS actuator and electric unit (control unit) • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the "C1A04" is detected as the current malfunction in "Self Diagnostic Result" of "AVM".

Is “C1A04” detected as the current malfunction?

YES >> Refer to DAS-43, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000009464672

1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts. Refer to BRC-45, "DTC Index".
NO >> GO TO 2.

2.CHECK ALL UNIT SELF-DIANOSIS RESULTS

Check if any DTC is detected except for ITS control unit about VDC in "ALL DTC READING" with CONSULT.

Is any DTC detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-128, "Removal and Installation".
NO >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".

C1A39 STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000009464673

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
C1A39	STRG SEN CIR	ITS control unit receives the message that means "Steering angle sensor is failed" from steering angle sensor.	• Steering angle sensor • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the "C1A39" is detected as the current malfunction in "Self Diagnostic Result" of "AVM".

Is “C1A39” detected as the current malfunction?

YES >> Refer to DAS-44, "Diagnosis Procedure".
NO >> Refer to GI-43, "Intermittent Incident".

Diagnosis Procedure

INFOID:0000000009464674

1.CHECK STRG SENSOR SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts. Refer to BRC-45, "DTC Index".
NO >> GO TO 2.

2.CHECK ALL UNIT SELF-DIANOSIS RESULTS

Check if any DTC is detected except for ITS control unit about ABS in "ALL DTC READING" with CONSULT.

Is any DTC detected except for ITS?

YES >> Replace steering angle sensor. Refer to BRC-132, "Removal and Installation".
NO >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".

U0122 VDC P-RUN DIAG

DTC Logic

INFOID:0000000009464675

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U0122	VDC P-RUN DIAG	ITS control unit receives the incorrect signal about P-RUN from VDC via V-CAN communication	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U0122” is detected as the current malfunction in self-diagnosis results of “AVM”.

Is “U0122” detected as the current malfunction?

YES >> Refer to DAS-45, "Diagnosis Procedure".
NO >> Refer to GI-43, "Intermittent Incident".

Diagnosis Procedure

INFOID:0000000009464676

1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts.
NO >> GO TO 2.

2.CHECK ITS CONTROL UNIT SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts.
NO >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-128, "Removal and Installation".

U0416 VDC CHECKSUM DIAG

DTC Logic

INFOID:0000000009464677

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U0416	VDC CHECKSUM DIAG	ITS control unit receives the incorrect signal about P-RUN from VDC via V-CAN communication	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U0416” is detected as the current malfunction in self-diagnosis results of “AVM”.

Is “U0416” detected as the current malfunction?

YES >> Refer to DAS-46, "Diagnosis Procedure".
NO >> Refer to GI-43, "Intermittent Incident".

Diagnosis Procedure

INFOID:0000000009464678

1.CHECK VDC UNIT SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts.
NO >> GO TO 2.

2.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts.
NO >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-128, "Removal and Installation".

U0428 STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000009464679

DTC	Display contents of CONSULT	DTC detection condition	Possible malfunction factor
U0428	ST ANGLE SENSOR CALIBRATION [U0428]	The neutral position adjustment of the steering angle sensor is incomplete.	Adjust neutral position of the steering angle sensor.

Diagnosis Procedure

INFOID:0000000009464680

1.ADJUST THE NEUTRAL POSITION OF THE STEERING ANGLE SENSOR

When U1232 is detected, adjust the neutral position of the steering angle sensor.

>> Perform adjustment of the neutral position of the steering angle sensor. Refer to BRC-33, "CONSULT Function (ABS)".

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000009464681

CAN COMMUNICATION

CAN (Controller Area Network) is a serial communication line for real time applications. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Modern vehicle is equipped with many electronic control units, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H, CAN-L) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads the required data only.
CAN communication signal chart. Refer to LAN-32, "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart".

ITS COMMUNICATION

- ITS communication is a multiplex communication system. This enables the system to transmit and receive large quantities of data at high speed by connecting control units with 2 communication lines.
- ITS communication lines adopt twisted-pair line style (two lines twisted) for noise immunity.

DTC Logic

INFOID:0000000009464682

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1000	CAN COMM CIRCUIT	If ITS control unit is not transmitting or receiving CAN communication signal or ITS communication signal for 2 seconds or more	• CAN communication system • ITS communication system

NOTE:
If “U1000” is detected, first diagnose the CAN communication system.

Diagnosis Procedure

INFOID:0000000009464683

1.PERFORM THE SELF-DIAGNOSIS

1. Turn the ignition switch ON.
2. Turn the MAIN switch of ITS system ON, and then wait for 30 seconds or more.
3. Perform “All DTC Reading” with CONSULT.
4. Check if the “U1000” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U1000” detected as the current malfunction?

YES >> Refer to DAS-48, "Description".
NO >> Refer to GI-43, "Intermittent Incident".

U1010 CONTROL UNIT (CAN)

Description

INFOID:0000000009464684

CAN controller controls the communication of CAN communication signal and ITS communication signal, and the error detection.

DTC Logic

INFOID:0000000009464685

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1010	CONTROL UNIT (CAN)	If ITS control unit detects malfunction by CAN controller initial diagnosis	ITS control unit

Diagnosis Procedure

INFOID:0000000009464686

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn the MAIN switch of ITS system ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U1010” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U1010” detected as the current malfunction?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Inspection End.

U111A REAR CAMERA IMAGE SIGNAL CIRCUIT

DTC Logic

INFOID:0000000009464687

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U111A	REAR CAMERA IMAGE SIGNAL	Rear camera image signal circuit is open or shorted	Check rear camera image signal circuit between rear camera and around view monitor control unit.

Diagnosis Procedure

INFOID:0000000009464688

Regarding Wiring Diagram information, refer to DAS-22, "Wiring Diagram".

1.CHECK CONTINUITY REAR CAMERA POWER SUPPLY AND GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect the ITS control unit connector and rear camera connector.
3. Check for continuity between ITS control unit harness connector and rear camera harness connector.

ITS control unit		Rear Camera		Continuity
Connector	Terminal	Connector	Terminal	
M59	51	B35	7	Yes
	52		8	

4. Check for continuity between ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M59	52		No

Is the inspection result normal?

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

2.CHECK VOLTAGE REAR CAMERA POWER SUPPLY

1. Connect the ITS control unit connector and rear camera connector.
2. Turn the ignition switch ON.
3. Check voltage between ITS control unit harness connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
ITS control unit				
Connector	Terminal			
M59	52	Ground	"CAMERA" switch is ON or shift selector is in R (Reverse)	6.2 V

Is inspection result normal?

YES >> GO TO 3.
NO >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".

3. CHECK CONTINUITY REAR CAMERA IMAGE SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect the ITS control unit connector and rear camera connector.
3. Check for continuity between ITS control unit harness connector and rear camera harness connector.

ITS control unit		Rear View Camera		Continuity
Connector	Terminal	Connector	Terminal	
M59	50	B35	1	Yes
	66		5	

4. Check for continuity between ITS control unit harness connector and ground.

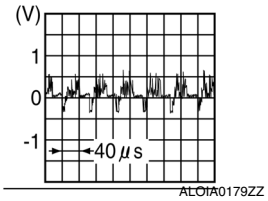
ITS control unit		Ground	Continuity
Connector	Terminal		
M59	50		No
	66		

Is inspection result normal?

YES >> GO TO 4.
NO >> Repair harness or connector.

4. CHECK REAR CAMERA IMAGE SIGNAL

1. Connect the ITS control unit connector and rear camera connector.
2. Turn the ignition switch ON.
3. Using an oscilloscope, check voltage between ITS control unit harness connector terminals.

Terminal				Condition	Voltage (Approx.)
(+)		(–)			
ITS control unit					
Connector	Terminal	Connector	Terminal		
M59	66	M59	50	"CAMERA" switch is ON or shift selector is in R (Reverse)	

Is inspection result normal?

YES >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Replace rear view camera. Refer to DAS-69, "Removal and Installation".

U1232 STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000009464689

DTC	Display contents of CONSULT	DTC detection condition	Possible malfunction factor
U1232	ST ANGLE SEN CALIB	The neutral position registration of the steering angle sensor cannot finish.	• Steering angle sensor • ITS control unit

Diagnosis Procedure

INFOID:0000000009464690

1.REGISTER THE NEUTRAL POSITION OF THE STEERING ANGLE SENSOR

1. Turn the ignition switch ON.
2. Perform registration of the neutral position of the steering angle sensor. Refer to DAS-14, "CONSULT Function (AVM)".
3. Check “Self Diagnostic Result” of “AVM” with CONSULT. Refer to DAS-14, "CONSULT Function (AVM)".

Is “ST ANGLE SEN CALIB” detected?

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

2.CHECK STEERING ANGLE SENSOR

Check steering angle sensor.

Is the inspection result normal?

YES >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

U1305 CAMERA IMAGE CALIB

DTC Logic

INFOID:0000000009464691

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1305	CAMERA CONFIG	ITS control unit configuration is incomplete	Perform ITS configuration with CONSULT

Diagnosis Procedure

INFOID:0000000009464692

1.CHECK SELF-DIAGNOSIS RESULTS

Check if “U1305” is current in “Self Diagnostic Result” of “AVM”.

Is “U1305” detected?

YES >> Perform ITS configuration using CONSULT. Refer to DAS-14, "CONSULT Function (AVM)". If problem persists, repair or replace the malfunctioning part.

NO >> Refer to GI-43, "Intermittent Incident".

U1308 CAMERA CONFIG

DTC Logic

INFOID:0000000009464693

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1308	ITS CALIB [U1308]	ITS control unit calibration is incomplete	Perform ITS calibration with CONSULT

Diagnosis Procedure

INFOID:0000000009464694

1.CHECK SELF-DIAGNOSIS RESULTS

Check if “U1308” is current in “Self Diagnostic Result” of “AVM”.

Is “U1308” detected?

YES >> Perform ITS calibration of camera image using CONSULT. Refer to DAS-14, "CONSULT Function (AVM)".

NO >> Refer to GI-43, "Intermittent Incident".

U1309 PUMP UNIT CURRENT

DTC Logic

INFOID:0000000009464695

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1309	PUMP UNIT CURRENT	ITS control unit detects the value of current from pump control unit is incorrect	• Rear view camera washer control unit • Harness • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U1309” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U1309” detected as the current malfunction?

YES >> Refer to DAS-55, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000009464696

Regarding Wiring Diagram information, refer to DAS-22, "Wiring Diagram".

1.CHECK REAR VIEW CAMERA AIR PUMP MOTOR POWER SUPPLY CIRCUIT

1. Disconnect the rear view camera washer control unit connector.
2. Turn the ignition switch ON.
3. Check voltage between rear view camera washer control unit connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
Rear view camera washer control unit				
Connector	Terminal			
B16	12	Ground	Ignition ON	12 V

Is inspection result normal?

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

2.CHECK REAR VIEW CAMERA AIR PUMP MOTOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Check for continuity between rear view camera washer control unit connector and ground.

Rear view camera washer control unit		Ground	Continuity
Connector	Terminal		
B16	5		Yes

Is the inspection result normal?

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

3.CHECK CONTINUITY ITS CONTROL UNIT TO REAR VIEW CAMERA WASHER CONTROL UNIT

1. Disconnect the ITS control unit connector.

2. Check for continuity between ITS control unit harness connector and rear view camera washer control unit connector.

ITS control unit		Rear view camera washer control unit		Continuity
Connector	Terminal	Connector	Terminal	
M58	2	B16	7	Yes
	3		8	

3. Check for continuity between ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	2		No
	3		

Is inspection result normal?

YES >> GO TO 4.
NO >> Repair the harness or connector.

4. CHECK CONTINUITY REAR VIEW CAMERA WASHER CONTROL UNIT TO PUMP

1. Disconnect rear view camera air pump connector.
2. Check for continuity between rear view camera washer control unit connector and pump connector.

Rear view camera washer control unit		Rear view camera air pump motor		Continuity
Connector	Terminal	Connector	Terminal	
B16	1	B17	1	Yes
	2		2	

3. Check for continuity between rear view camera washer control unit connector and ground.

Rear view camera washer control unit		Ground	Continuity
Connector	Terminal		
B16	1		No
	2		

Is inspection result normal?

YES >> GO TO 5.
NO >> Repair the harness or connector.

5. CHECK REAR VIEW CAMERA AIR PUMP MOTOR ITS CONTROL UNIT SUPPLY CIRCUIT

Momentarily connect a jumper from a fused battery positive to terminal 1 and from ground to terminal 2 of the rear view camera air pump motor.

Does the pump operate?

YES >> GO TO 6.
NO >> Replace the rear view camera air pump motor.

6. CHECK REAR VIEW CAMERA AIR PUMP MOTOR ITS CONTROL UNIT SUPPLY CIRCUIT

1. Reconnect the ITS control unit connector.
2. Turn the ignition switch ON.
3. Using CONSULT, activate the rear view camera air pump while checking voltage between rear view camera washer control unit connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
Rear view camera washer control unit				
Connector	Terminals			
B16	7, 8	Ground	Activating pump	5 V

Can voltage be measured on either terminal?

YES >> Replace rear view camera washer control unit.
NO >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".

U130B REAR CAMERA COMM ERROR

DTC Logic

INFOID:0000000009464697

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U130B	REAR CAMERA COMM ERROR	ITS control unit receives the incorrect communication signal from rear view camera.	• Rear view camera • Harness • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U130B” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U130B” detected as the current malfunction?

YES >> Refer to DAS-58, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000009464698

Regarding Wiring Diagram information, refer to DAS-22, "Wiring Diagram".

1.CONNECTOR CHECK

Check the ITS control unit and rear view camera connectors for the following:
- Proper connection
- Damage
- Disconnected or loose terminals

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair the terminal and connector.

2.CHECK REAR VIEW CAMERA VOLTAGE

1. Connect ITS control unit and rear view camera harness connectors.
2. Check voltage between ITS control unit connector M59 and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
ITS control unit				
Connector	Terminal			
M59	68	Ground	Ignition ON	5 V

Is the inspection result normal?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Replace rear view camera. Refer to DAS-69, "Removal and Installation".

U1310 PUMP UNIT CIRCUIT

DTC Logic

INFOID:0000000009464699

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1310	PUMP UNIT CIRCUIT	ITS control unit detects the value of voltage from pump control unit is incorrect	• Rear view camera washer control unit • Harness • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U1310” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U1310” detected as the current malfunction?

YES >> Refer to DAS-59, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000009464700

Regarding Wiring Diagram information, refer to DAS-22, "Wiring Diagram".

1.CHECK REAR VIEW CAMERA AIR PUMP MOTOR POWER SUPPLY CIRCUIT

1. Disconnect the rear view camera washer control unit connector.
2. Turn the ignition switch ON.
3. Check voltage between rear view camera washer control unit connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
Rear view camera washer control unit				
Connector	Terminal			
B16	12	Ground	Ignition ON	Battery voltage

Is inspection result normal?

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

2.CHECK REAR VIEW CAMERA AIR PUMP MOTOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Check for continuity between rear view camera washer control unit connector and ground.

Rear view camera washer control unit		Ground	Continuity
Connector	Terminal		
B16	5		Yes

Is the inspection result normal?

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

3.CHECK CONTINUITY ITS CONTROL UNIT TO REAR VIEW CAMERA WASHER CONTROL UNIT

1. Disconnect the ITS control unit connector.

2. Check for continuity between ITS control unit harness connector and rear view camera washer control unit connector.

ITS control unit		Rear view camera washer control unit		Continuity
Connector	Terminal	Connector	Terminal	
M58	2	B16	7	Yes
	3		8	

3. Check for continuity between ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	2		No
	3		

Is inspection result normal?

YES >> GO TO 4.
NO >> Repair the harness or connector.

4. CHECK CONTINUITY REAR VIEW CAMERA WASHER CONTROL UNIT TO PUMP

1. Disconnect rear view camera air pump connector.
2. Check for continuity between rear view camera washer control unit connector and pump connector.

Rear view camera washer control unit		Rear view camera air pump motor		Continuity
Connector	Terminal	Connector	Terminal	
B16	1	B17	1	Yes
	2		2	

3. Check for continuity between rear view camera washer control unit connector and ground.

Rear view camera washer control unit		Ground	Continuity
Connector	Terminal		
B16	1		No
	2		

Is inspection result normal?

YES >> GO TO 5.
NO >> Repair the harness or connector.

5. CHECK REAR VIEW CAMERA AIR PUMP MOTOR ITS CONTROL UNIT SUPPLY CIRCUIT

Momentarily connect a jumper from a fused battery positive to terminal 1 and from ground to terminal 2 of the rear view camera air pump motor.

Does the pump operate?

YES >> GO TO 6.
NO >> Replace the rear view camera air pump motor.

6. CHECK REAR VIEW CAMERA AIR PUMP MOTOR ITS CONTROL UNIT SUPPLY CIRCUIT

1. Reconnect the ITS control unit connector.
2. Turn the ignition switch ON.
3. Activate the rear view camera air pump while checking voltage between rear view camera washer control unit connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
Rear view camera washer control unit				
Connector	Terminals			
B16	7, 8	Ground	Activating pump	5 V

Can voltage be measured on either terminal?

YES >> Replace rear view camera washer control unit.
NO >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:0000000009464701

Regarding Wiring Diagram information, refer to DAS-22, "Wiring Diagram".

1.CHECK ITS CONTROL UNIT POWER SUPPLY CIRCUIT

Check voltage between ITS control unit harness connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
ITS control unit		Ground	Ignition switch	
Connector	Terminal			
M58	20		OFF	Battery voltage
			ON	Battery voltage
	39		OFF	0 V
			ON	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair the ITS control unit power supply circuit.

2.CHECK ITS CONTROL UNIT GROUND CIRCUIT

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

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	40		Yes

Is the inspection result normal?

YES >> Inspection End.
NO >> Repair the ITS control unit ground circuit.

WARNING SYSTEMS SWITCH CIRCUIT

Component Function Check

INFOID:0000000009464702

1.CHECK WARNING SYSTEMS SWITCH INPUT SIGNAL

1. Turn the ignition switch ON.
2. Select the DATA MONITOR item “ITS SW 1” of “AVM” with CONSULT.
3. With operating the warning systems switch, check the monitor status.

Monitor item	Condition	Monitor status
ITS SW 1	Warning systems switch is pressed	On
	Warning systems switch is not pressed	OFF

Is the inspection result normal?

YES >> Warning systems switch circuit is normal.
NO >> Refer to DAS-63, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000009464703

Regarding Wiring Diagram information, refer to DAS-22, "Wiring Diagram".

1.CHECK WARNING SYSTEMS SWITCH SIGNAL INPUT

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

Terminals			Condition	Voltage (Approx.)
(+)		(–)		
ITS control unit		Ground	Warning systems switch	
Connector	Terminal			
M58	32		Pressed	0 V
			Released	12 V

Is the inspection result normal?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> GO TO 2.

2.CHECK WARNING SYSTEMS SWITCH

1. Turn ignition switch OFF.
2. Remove warning systems switch.
3. Check warning systems switch. Refer to DAS-64, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace the warning systems switch. Refer to DAS-142, "Removal and Installation".

3.CHECK WARNING SYSTEMS SWITCH GROUND CIRCUIT

Check continuity between warning system switch harness connector terminal and ground.

Warning system switch		Ground	Continuity
Connector	Terminal		
M62	8		Yes

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4.CHECK WARNING SYSTEMS SWITCH SIGNAL INPUT CIRCUIT FOR OPEN

1. Disconnect the ITS control unit connector.
2. Check continuity between the ITS control unit harness connector and warning system switch harness connector.

ITS control unit		Warning system switch		Continuity
Connector	Terminal	Connector	Terminal	
M58	32	M62	6	Yes

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair the harnesses or connectors.

5.CHECK WARNING SYSTEMS SWITCH SIGNAL INPUT CIRCUIT FOR SHORT

Check continuity between the ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	32		No

Is the inspection result normal?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Repair the harnesses or connectors.

Component Inspection

INFOID:0000000009464704

1.CHECK WARNING SYSTEMS SWITCH

Check continuity of warning systems switch.

Terminal		Condition	Continuity
6	8	When warning systems switch is pressed	Yes
		When warning systems switch is released	No

Is the inspection result normal?

YES >> Inspection End.
NO >> Replace the warning systems switch. Refer to DAS-142, "Removal and Installation".

WARNING SYSTEMS ON INDICATOR CIRCUIT

Component Function Check

INFOID:0000000009464705

1.CHECK WARNING SYSTEMS ON INDICATOR

1. Turn the ignition switch ON.
2. Select the active test item “BSW ON INDICATOR” of “AVM” with CONSULT.
3. With operating the test item, check the operation.

On : Warning systems ON indicator illuminates
Off : Warning systems ON indicator is turned OFF

Is the inspection result normal?

YES >> Inspection End.
NO >> Refer to DAS-65, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000009464706

Regarding Wiring Diagram information, refer to DAS-22, "Wiring Diagram".

1.CHECK WARNING ON INDICATOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect warning system switch connector.
3. Turn ignition switch ON.
4. Check voltage between warning system switch harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(−)	
Warning system switch		Ground	
Connector	Terminal		
M62	5		Battery voltage

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair the warning systems ON indicator power supply circuit.

2.CHECK WARNING SYSTEMS ON INDICATOR SIGNAL FOR OPEN

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

ITS control unit		Warning system switch		Continuity
Connector	Terminal	Connector	Terminal	
M58	33	M62	3	Yes

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair the harnesses or connectors.

3.CHECK WARNING SYSTEMS ON INDICATOR SIGNAL CIRCUIT FOR SHORT

Check continuity between the ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	33		No

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair the harnesses or connectors.

4. CHECK WARNING SYSTEMS ON INDICATOR

Check the warning systems ON indicator. Refer to DAS-66, "Component Inspection".

Is the inspection result normal?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Replace warning systems switch. DAS-142, "Removal and Installation".

Component Inspection

INFOID:0000000009464707

1. CHECK WARNING SYSTEMS ON INDICATOR

Apply battery voltage to warning systems switch terminals 3 and 5, and then check if the warning systems ON indicator illuminates.

Terminals		Condition	Warning systems ON indicator
(+)	(-)		
5	3	When the battery voltage is applied	On
		When the battery voltage is not applied	Off

Is the inspection result normal?

YES >> Inspection End.
NO >> Replace the warning systems switch. Refer to DAS-142, "Removal and Installation".

WARNING BUZZER CIRCUIT

Component Function Check

INFOID:0000000009464708

1.CHECK WARNING BUZZER

1. Turn the ignition switch ON.
2. Select the active test item “BUZZER” of “BCM” with CONSULT.
3. With operating the test item, check the operation.

On : Warning buzzer is activated.
Off : Warning buzzer is not activated.

Is the inspection result normal?

YES >> Inspection End.
NO >> Refer to DAS-67, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000009464709

1.CHECK WARNING BUZZER OPERATION

While activating the buzzer with CONSULT, listen for the buzzer sound.

Does warning buzzer sound?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Replace the combination meter (buzzer).

REMOVAL AND INSTALLATION

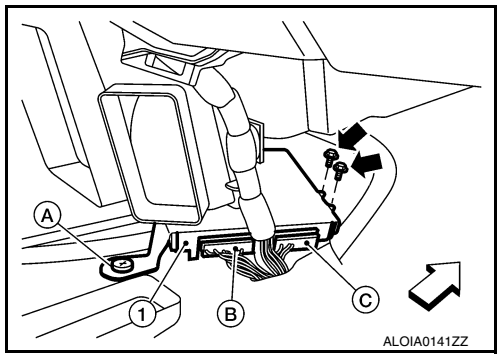
ITS CONTROL UNIT

Removal and Installation

INFOID:0000000009464711

REMOVAL

1. Disconnect the battery negative terminal. Refer to PG-73, "Removal and Installation (Battery)".
2. Remove the center console assembly. Refer to IP-18, "Removal and Installation".
3. Disconnect the harness connectors (B,C) from the ITS control unit (1).
   ⇦: Front
4. Remove bolts (⬅) and plastic screw (A) that retain the ITS control unit (1) and remove.



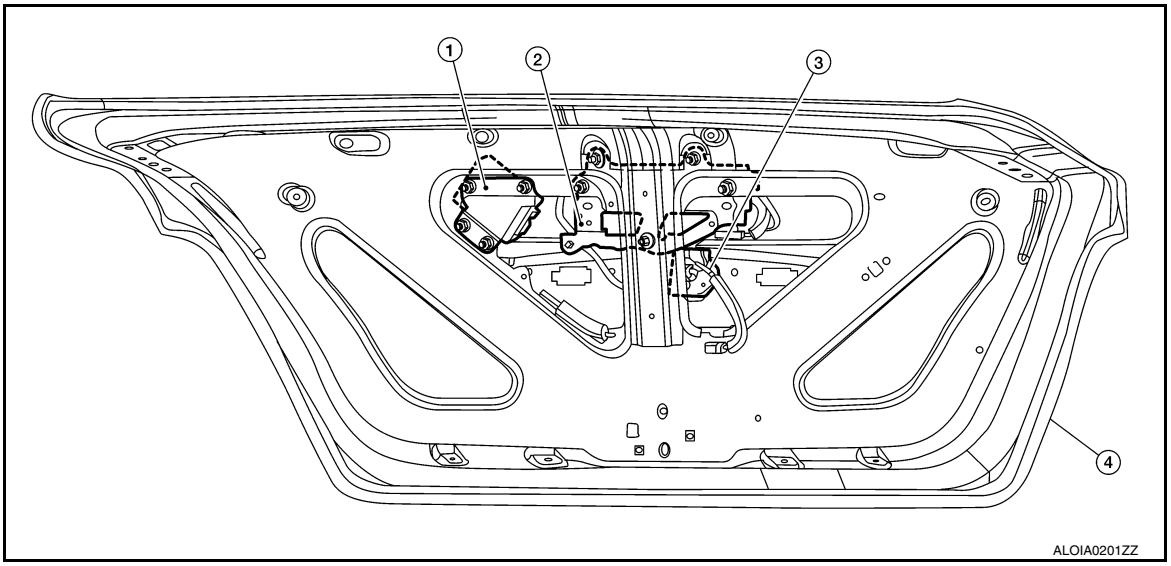
INSTALLATION

Installation is in the reverse order of removal.

REAR VIEW CAMERA

Exploded View

INFOID:0000000009978529



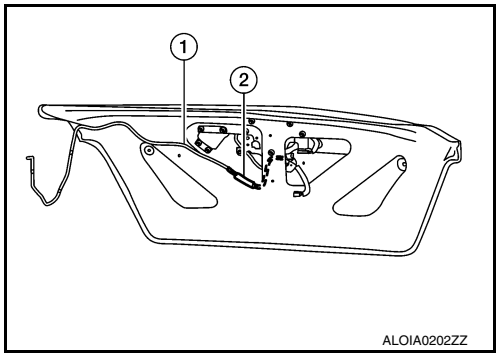
1. Rear view camera washer control unit
2. Rear view camera air pump motor
3. Rear view camera
4. Trunk lid

Removal and Installation

INFOID:0000000009978528

REMOVAL

1. Remove rear view camera air pump motor. Refer to DAS-71, "Removal and Installation".
2. Disconnect the rear washer tube (1) from rear view camera (2).



3. Disconnect the harness connector from the rear view camera and remove.

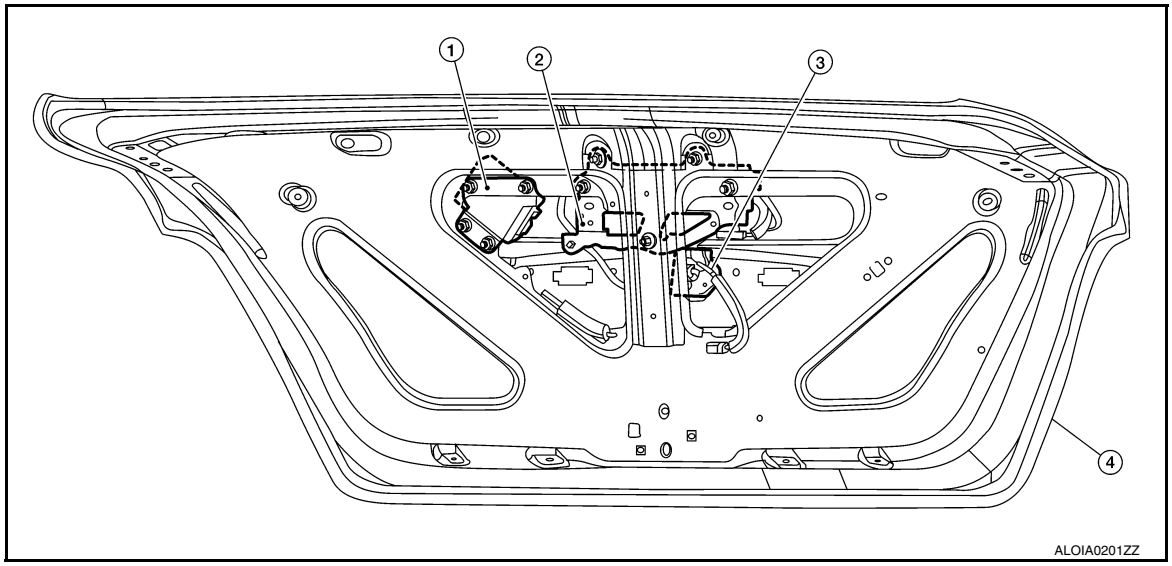
INSTALLATION

Installation is in the reverse order of removal.

REAR VIEW CAMERA WASHER CONTROL UNIT

Exploded View

INFOID:0000000009464710



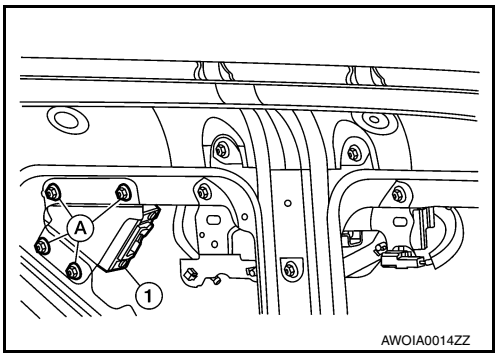
1. Rear view camera washer control unit
2. Rear view camera air pump motor
3. Rear view camera
4. Trunk lid

Removal and Installation

INFOID:0000000009464712

REMOVAL

1. Remove the trunk lid finisher. Refer to INT-33, "TRUNK LID FINISHER : Removal and Installation".
2. Disconnect the harness connector from the rear view camera washer control unit.
3. Remove the rear view camera washer control unit nuts (A).
4. Remove the rear view camera washer control unit (1).



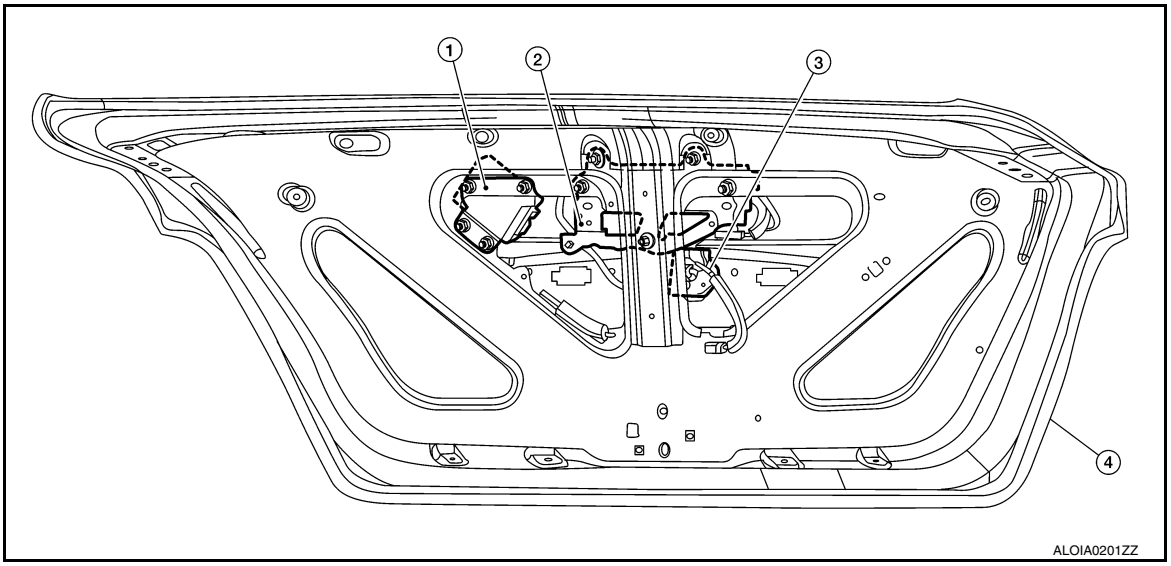
INSTALLATION

Installation is in the reverse order of removal.

REAR VIEW CAMERA AIR PUMP MOTOR

Exploded View

INFOID:0000000009464713



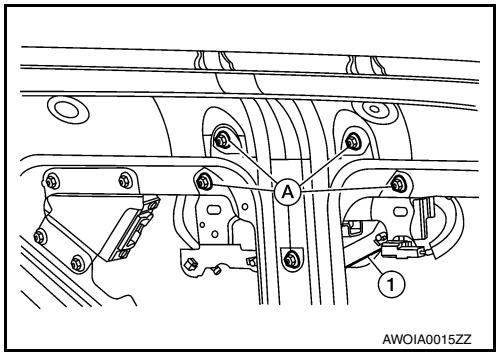
1. Rear view camera washer control unit
2. Rear view camera air pump motor
3. Rear view camera
4. Trunk lid

Removal and Installation

INFOID:0000000009464714

REMOVAL

1. Remove the trunk lid finisher. Refer to INT-33, "TRUNK LID FINISHER : Removal and Installation".
2. Disconnect the air tubes from the rear view camera air pump motor.
3. Disconnect the harness connector from the rear view camera air pump motor.
4. Remove the rear view camera air pump motor bracket nuts (A).
5. Remove the rear view camera air pump motor (1).



INSTALLATION

Installation is in the reverse order of removal.

PRECAUTION

PRECAUTIONS

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

INFOID:0000000009951640

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, 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 three minutes before performing any service.**

Precaution for Work

INFOID:0000000009464716

- 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.

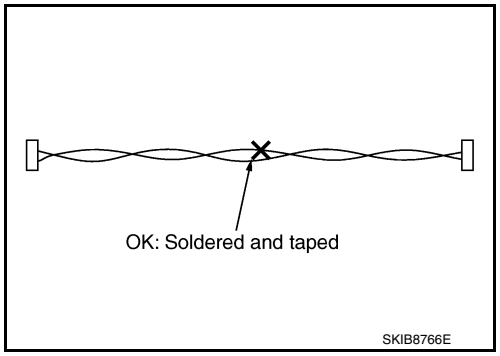
- Do not use organic solvent such as thinner, benzene, alcohol or gasoline.
- For genuine leather seats, use a genuine leather seat cleaner.

Precautions For Harness Repair

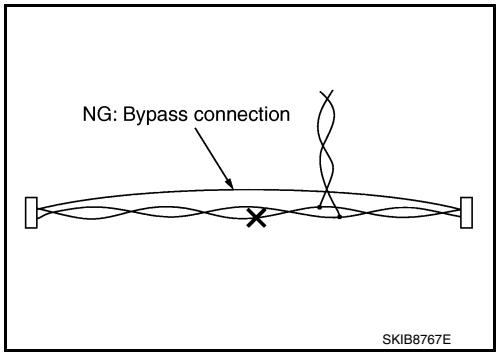
INFOID:0000000009464717

ITS communication uses a twisted pair line. Be careful when repairing it.

- Solder the repaired area and wrap tape around the soldered area.
  NOTE:
  A fray of twisted lines must be within 110 mm (4.33 in).



- Bypass connection is never allowed at the repaired area.
  NOTE:
  Bypass connection may cause ITS communication error. The spliced wire becomes separated and the characteristics of twisted line are lost.



Precaution for LDW System Service

INFOID:0000000009464718

WARNING:
Be cautious of traffic conditions and other vehicles when performing a road test.
CAUTION:
- **Do not use the LDW system when driving with free rollers or a chassis dynamometer.**
- **Do not disassemble or alter the rear view camera.**
- **Do not use the rear view camera when removed from the vehicle.**
- **Do not disable the LDW system without the consent of the customer.**

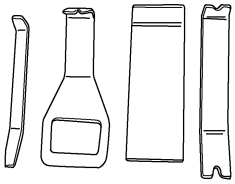
PREPARATION

PREPARATION

Special Service Tool

INFOID:0000000009464719

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

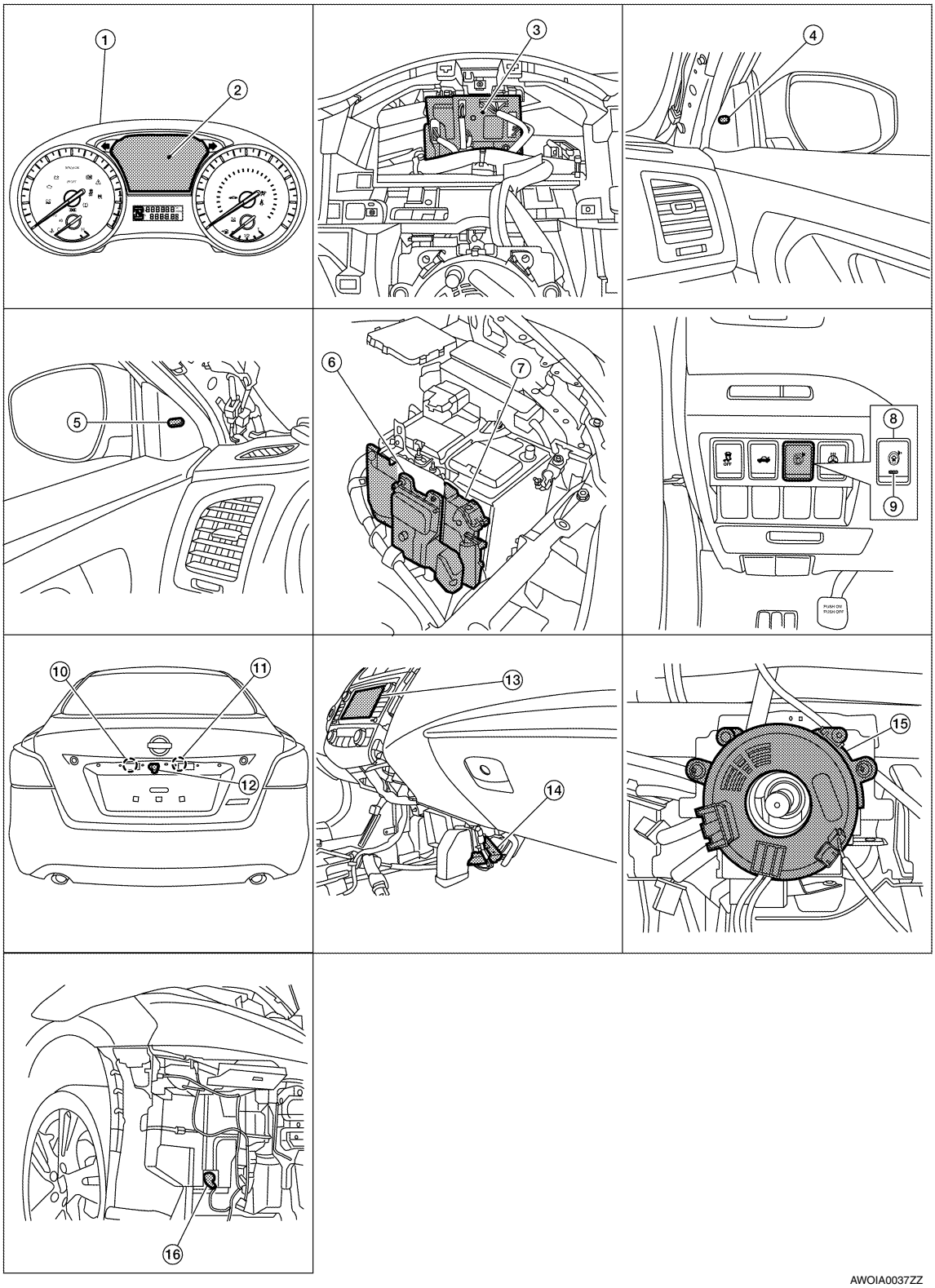
Tool number (TechMate No.) Tool name	Description
— (J-46534) Trim Tool Set  AWJIA0483ZZ	Removing trim components

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000009464720



AWOIA0037ZZ

1. Combination meter
2. Vehicle information display
3. BCM (view with combination meter removed)
4. Blind spot warning indicator RH
5. Blind spot warning indicator LH
6. TCM
7. ECM
8. Warning systems switch
9. Warning systems ON indicator
10. Rear view camera washer control unit
11. Rear view camera air pump motor
12. Rear view camera
13. AV control unit (center display) (with navigation system and bose audio system) Audio unit (center display) (with display audio system and bose audio system)
14. ITS control unit (view with center console removed)
15. Steering angle sensor (view with steering wheel removed)
16. Washer fluid level switch (view with front fascia removed)

Component Description

INFOID:0000000009464721

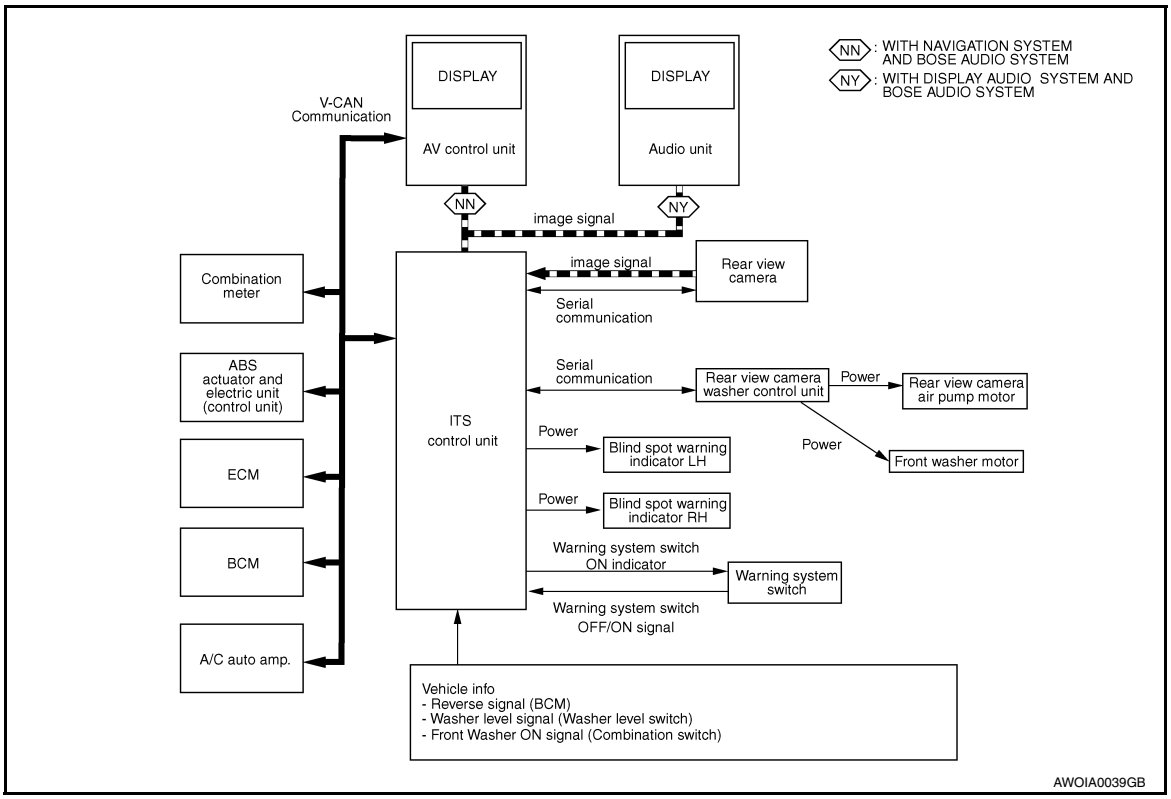
Component	Description
ITS control unit	• Judges the lane departure depending on the lane detection result and each signal • Controls the warning buzzer and the warning systems ON indicator • Transmits lane departure warning lamp signal to combination meter via CAN communication
Warning systems switch	Inputs the warning systems switch signal to ITS control unit
Warning systems ON indicator (On the warning systems switch)	Turns on the warning systems ON indicator, according to a warning systems ON indicator signal received from the ITS control unit
Rear view camera	• Detects the lane marker in travel lane • Transmits the detected lane condition signal to ITS control unit via ITS communication
ABS actuator and electric unit (control unit)	• Transmits vehicle speed signal to ITS control unit via CAN communication • Transmits yaw rate signal/side G sensor signal to ITS control unit via CAN communication
Buzzer (combination meter)	Activates the warning buzzer, according to a warning buzzer signal received from the ITS control unit
Combination meter	• Turns the Lane Departure Warning lamp ON/OFF according to the signals from ITS control unit via CAN communication • Receives Lane Departure Warning ON indicator signal via CAN communication.
Steering angle sensor	Transmits steering angle sensor signal to ITS control unit via CAN communication
BCM	• Transmits turn signal indicator to ITS control unit via CAN communication • Transmits dimmer signal to ITS control unit via CAN communication
ECM	Transmits engine speed signal to ITS control unit via CAN communication
TCM	Transmits the output shaft speed signal, input speed signal, current gear position signal and shift position signal to ITS control unit via CAN communication
AV control unit (with navigation system and bose audio system)	Receives the various systems and camera signals via CAN communication and routes them to the center display
Audio unit (with display audio system and bose audio system)	Receives the various systems and camera signals and routes them to the center display
Center display	Displays the various system screen signals according to the priority level received via CAN communication
Rear view camera washer control unit	Controls the air pump to drive air to the rear camera lens according to the signals received from the ITS control unit
Rear view camera air pump motor	Drives air to the rear camera lens according to the signals received from the pump control unit

SYSTEM

System Description

INFOID:0000000009464722

SYSTEM DIAGRAM



ITS CONTROL UNIT INPUT/OUTPUT SIGNAL ITEM

Input Signal Item

Transmit unit	Signal name		Description
BCM	CAN communication	Turn indicator signal	Receives an operational state of the turn signal lamp and the hazard lamp
Rear view camera	ITS communication	Detected lane condition signal	Receives detection results of lane marker
Warning systems switch	Warning systems switch signal		Receives an ON/OFF state of the warning systems switch

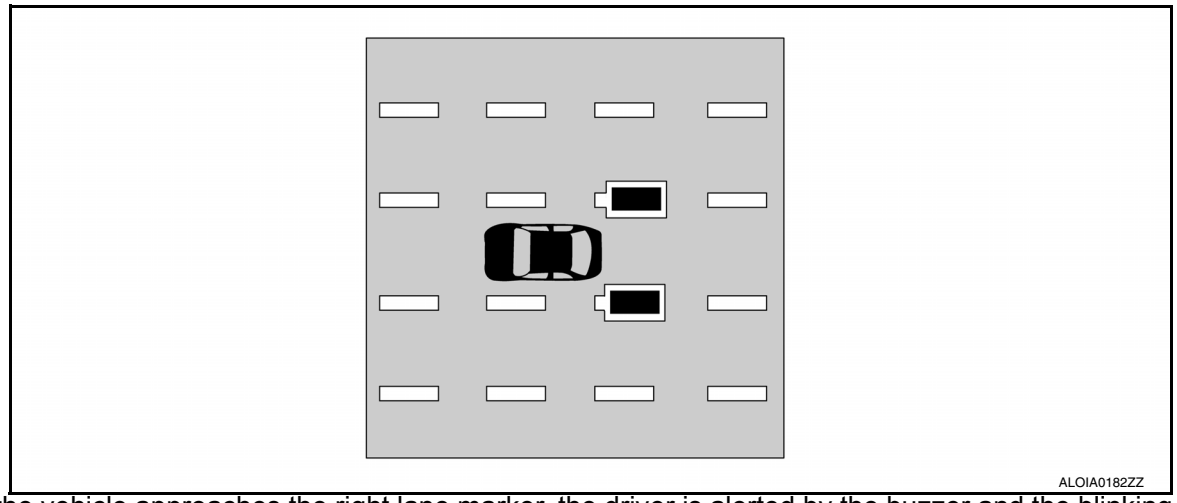
Output Signal Item

Reception unit	Signal name		Description
Combination meter	CAN communication	Lane departure warning lamp signal	Transmits a lane departure warning lamp signal to turn ON the lane departure warning lamp
Rear view camera	ITS communication	Vehicle speed signal	Transmits a vehicle speed calculated by the ITS control unit
		Turn indicator signal	Transmits a turn indicator signal received from BCM
Warning buzzer	Warning buzzer signal		Activates the warning buzzer
Warning systems ON indicator	Warning systems ON indicator signal		Turns ON the warning systems ON indicator

FUNCTION DESCRIPTION

- Lane Departure Warning (LDW) system provides a lane departure warning function when the vehicle is driven at speeds of approximately 70 km/h (45 MPH) or more.
- When the vehicle approaches either the left or the right side of the traveling lane, a warning will sound and the lane departure warning lamp (orange) on the combination meter will blink to alert the driver.
- The warning does not occur during turn signal operation (Lane change side).
- The warning function will stop when the vehicle returns inside of the lane markers.

EXAMPLE



When the vehicle approaches the right lane marker, the driver is alerted by the buzzer and the blinking of lane departure warning lamp (orange).

OPERATION DESCRIPTION

- When the system is turned ON by operating the warning systems switch, ITS control unit turns ON the warning systems ON indicator.
- Rear view camera monitors lane markers of the traveling lane. It transmits the detected lane condition signal to ITS control unit via ITS communication.
- When judging from a lane marker detection signal that the vehicle is approaching the lane marker, the ITS control unit controls the following item to alert the driver.

- Activates warning buzzer
- ITS control unit transmits a lane departure warning lamp signal to combination meter via CAN communication and turns ON/OFF the lane departure warning lamp (orange).

OPERATING CONDITION

- Warning systems ON indicator: ON
- Vehicle speed: approximately 70 km/h (45 MPH) or more
- Turn indicator signal: After 2 seconds or more from turned OFF

NOTE:

- When the LDW system setting on the vehicle information display is ON.
- After the operating conditions of warning are satisfied, the warning continues until the vehicle speed reaches approximately 60 km/h (40 MPH)
- The LDW system may not function properly, depending on the situation. Refer to DAS-82, "Precautions for Lane Departure Warning"

Bulb Check Action and Fail-safe Indication

Vehicle condition/ Driver's operation	Warning systems ON indicator	Indication on the combination meter
Ignition switch OFF ⇒ ON (Bulb check)	Approx. 5 sec. ON	ON (white)  ALOIA0183ZZ ON: Operational Blinking: LDW detected
When DTC is detected (Except “U1308”)	ON	LDW OFF (orange)
Camera aiming is not completed (“U1308”is detected) **NOTE:** This is detected while driving the vehicle and the indication remains ON until the ignition switch is turned OFF	ON	 ALOIA0159GB
When rear camera needs cleaning	OFF	Unavailable: Clean Rear Camera
Temporary disabled status	OFF	LDW light (white) will blink
When the warning systems switch is pressed (When the settings of LDW system and BSW system on the vehicle information display is “OFF”)	Blink	—

Fail-safe (ITS Control Unit)

INFOID:0000000009464723

If a malfunction occurs in each system, ITS control unit cancels each control, and turns ON the warning lamp or indicator lamp.

System	Warning lamp/Indicator lamp	Description
Blind Spot Warning (BSW)	Blind Spot Warning lamp	Cancel
Lane Departure Warning (LDW)	Lane Departure Warning indicator	Cancel

Fail-safe (Rear View Camera)

INFOID:0000000009464724

FAIL-SAFE CONTROL BY DTC

If a malfunction occurs in the rear view camera, ITS control unit cancels control, and turns ON the lane departure warning lamp in the combination meter.

BSW/LDW TEMPORARY DISABLED STATUS

Under the following condition, the BSW and/or LDW system is turned off temporarily, the BSW light (white) and /or LDW light (white) will blink, and either of the following messages will appear in the vehicle information display:

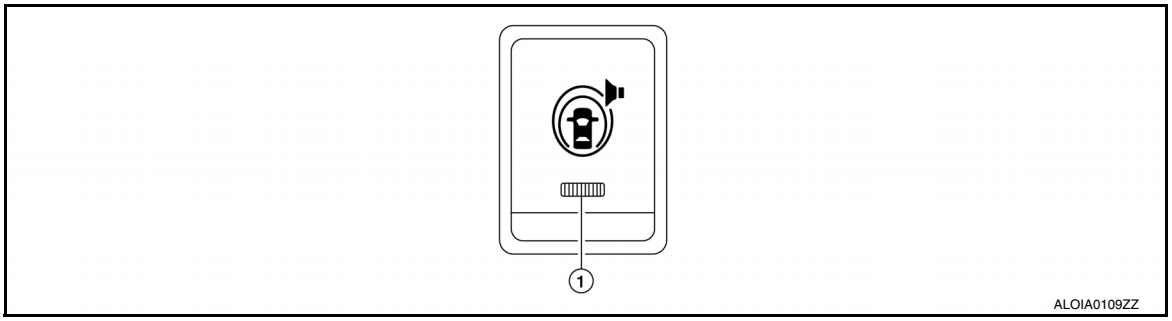
- ”trunk is open”
- ”washer fluid is low”

When the above condition no longer exists, the BSW and /or LDW system will resume automatically.

OPERATION

Switch Name and Function

INFOID:0000000009464725

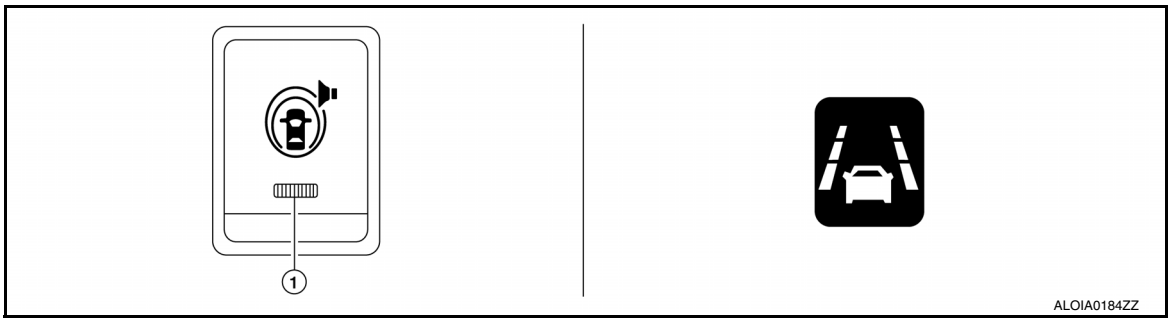


No.	Switch name	Description
1	Warning systems switch	Turns LDW system ON/OFF (When the setting of LDW system on the navigation system screen is ON)

Menu Displayed by Pressing Each Switch

INFOID:0000000009464726

INDICATOR LAMP AND WARNING LAMP



No.	Display item	Description
1	Warning systems ON indicator	Indicates that the LDW and/or BSW system is ON
2	Lane departure warning lamp	• Blinks when LDW system is activated • Turns ON when LDW system has a malfunction • Blinks when DTC is detected or system is temporarily disabled • Blinks when rear view camera blockage is detected

DISPLAY AND WARNING

Vehicle condition/ Driver's operation		Action	Warning systems ON indicator	Indication on the combination meter	Buzzer
Less than Approx. 60 km/h (40 MPH)	Close to lane marker	No action	ON	White	—

Vehicle condition/ Driver's operation		Action	Warning systems ON indicator	Indication on the combination meter	Buzzer
Approx. 70 km/h (45 MPH) or more	Close to lane marker	Warning • Buzzer sounds • Warning lamp blinks (orange)	ON	OFF (orange) Blink  ALOIA0185ZZ	Short continuous beeps
	• Close to lane marker • Turn signal ON (Deviate side)	No action	ON	White	—

NOTE:
After the operating conditions of warning are satisfied, the warning continues until the vehicle speed reaches approximately 60 km/h (40 MPH). Refer to DAS-77, "System Description".

HANDLING PRECAUTION

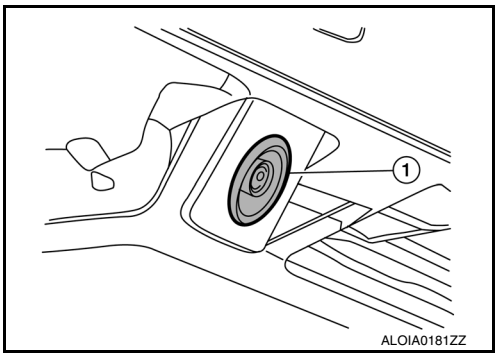
Precautions for Lane Departure Warning

INFOID:0000000009464727

REAR VIEW CAMERA HANDLING

The rear camera unit “1” for the LDW/BSW systems is located above the rear license plate.
To keep the proper operation of the LDW systems and prevent a system malfunction, be sure to observe the following:

- Always keep the camera lens clean. Be careful not to damage the nozzle of the automatic washer and blower.
- Do not attach ”license plate accessories” that reflect light.
- Do not strike or damage the areas around the camera unit.



LANE DEPARTURE WARNING (LDW)

- LDW system is only a warning device to inform the driver of a potential unintended lane departure. It will not steer the vehicle or prevent loss of control. It is the driver’s responsibility to stay alert, drive safely, keep the vehicle in the traveling lane, and be in control of the vehicle at all times.
- The camera unit may not detect properly under the following conditions:
- When towing a trailer.
- When strong light enters the camera unit. (For example, direct sunlight or headlight from the rear.)
- When ambient light changes instantly. (For example, when the vehicle enters or exits a tunnel or passes under a bridge.)
- Automatic washer and blower may not be able to secure detection capability when excessive dirt adheres on the camera lens.
- Excessive noise (e.g. audio system volume, open vehicle window) will interfere with the chime sound, and it may not be heard.
- The camera unit may not be able to detect properly under the following conditions:
- On roads where there are multiple parallel lane markers; lane markers that are faded or not painted clearly; yellow painted lane markers; non-standard lane markers; or lane markers covered with water, dirt or snow, etc.
- On roads where the discontinued lane markers are still detectable.
- On roads where there are sharp curves.
- On roads where there are sharply contrasting objects, such as shadows, snow, water, wheel ruts, seams or lines remaining after road repairs. (The LDW system could detect these items as lane markers.)
- On roads where the traveling lane merges or separates.
- When the vehicle's traveling direction does not align with the lane marker.
- When the road surface is very dark due to scarce ambient light or impaired tail lamp.
- When driving on a curved road, warning will be late on the outside of the curve due to the nature of the system.

DIAGNOSIS SYSTEM (ITS CONTROL UNIT)

CONSULT Function (AVM)

INFOID:0000000009951637

CAUTION:
After disconnecting the CONSULT vehicle interface (VI) 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 performs the following functions via CAN communication using ITS control unit.

Diagnosis mode	Description
Self Diagnostic Result	Displays the name of a malfunctioning system stored in the ITS control unit
Data Monitor	Displays ITS control unit input/output data in real time
Work support	Displays causes of automatic system cancellation occurred during system control
Active Test	Enables an operational check of a load by transmitting a driving signal from the ITS control unit to the load
ECU identification	Displays ITS control unit part number
Configuration	The vehicle specification can be written when replacing the ITS control unit

SELF DIAGNOSTIC RESULT

Refer to DAS-89, "DTC Index".

DATA MONITOR

Monitored item [Unit]	Description
ST ANGLE SENSOR SIGNAL [On/Off]	Indicates [On/Off] status as judged from ITS control unit (Angle sensor transmits angle signal through CAN communication)
REVERSE SIGNAL [On/Off]	Indicates [On/Off] status as judged from ITS control unit (TCM transmits reverse signal through CAN communication)
VEHICLE SPEED SIGNAL [On/Off]	Indicates vehicle speed calculated from ITS control unit through CAN communication [ABS actuator and electric unit (control unit) transmits vehicle speed signal (wheel speed) through CAN communication]
CAMERA SWITCH SIGNAL [On/Off]	Indicates [On/Off] status of camera switch signal as judged from ITS control unit
CAMERA OFF SIGNAL [On/Off]	Indicates [On/Off] status of camera OFF signal as judged from ITS control unit
ST ANGLE SENSOR TYPE [Absolute/Not]	Indicates whether steering angle sensor type is absolute or not (ON means “controlling”)
STEERING GEAR RATIO TYPE [Type 0/1]	Indicates the type of the steering gear ratio (type 1 or 2)
STEERING POSITION [LHD/RHD]	Indicates the steering position (LHD or RHD)
REAR CAMERA IMAGE SIGNAL [OK/Not]	Indicates the status of the rear camera image as read from ITS control unit through dedicated ITS communication lines
WASH SW [ON/OFF]	Indicates the state of the wash switch indicator output
R-CAMERA COMM STATUS [OK/Not]	Indicates the status of the rear camera communication status as read from ITS control unit through dedicated ITS communication lines
R-CAMERA COMM LINE [OK/Not]	Indicates the condition of the rear camera communication line whether transmitting properly through dedicated ITS communication lines
PUMP COMM STATUS [OK/NG]	Indicates the state of the communication signal from pump control unit

Monitored item [Unit]	Description
ILL [On/Off]	Indicates [On/Off] status of the illumination signal
ITS SW 1 [On/Off]	Indicates the state of the warning system switch as seen by the ITS control unit
ITS SW 1 IND [On/Off]	Indicates the state of the warning system switch indicator output
TURN SIGNAL [Left/N/Right]	Indicates [Left/N/Right] status of the turn signal output
ITS SW 2 [ON/OFF/No setting]	Indicates the state of the warning system secondary switch as seen by the ITS control unit
ITS SW 2 IND [ON/OFF/No setting]	Indicates the state of the warning system secondary switch indicator output

WORK SUPPORT

Work support items	Description
PREDICTIVE COURSE LINE DISPLAY	Setting whether predictive guide line displays or not
INITIALIZE CAMERA IMAGE CALIBRATION	Start the initialization process of the rear camera
STEERING ANGLE SENSOR ADJUSTMENT	Execute register neutral point of steering angle sensor
CALIBRATING CAMERA IMAGE (REAR CAMERA)	Displays the various values of the rear camera during the calibration process
REAR WIDE-VIEW FIXED GUIDE LINE CORRECTION	Adjustment the position of fixed guide line on rear wide view
REAR CAMERA ITS	Displays and sets camera image calibration values
CAUSE OF LDW CANCEL	Displays the information about reason of LDW cancellation
CAUSE OF BSW CANCEL	Displays the information about reason of BSW cancellation

ACTIVE TEST

CAUTION:

- **Never perform “Active Test” while driving the vehicle.**
- **The “Active Test” cannot be performed when the following systems warning indicators are illuminated:**
  - **Lane Departure Warning indicator**
  - **Blind Spot Warning indicator**
- **Place the shift selector to P (park) position, and then perform the test.**

Test item		Description
WASH ACTIVE	ON	Activates the washer to clean the lens of rear camera
	OFF	
LED LH INDICATOR	ON	Flashes the left side LED light for ITS system
	OFF	
LED RH INDICATOR	ON	Flashes the right side LED light for ITS system
	OFF	
AIR ACTIVE	ON	Activates the air pump to clean the lens of rear camera
	OFF	
AIR & WASH ACTIVE	ON	Activates the air pump and washer to clean the lens of rear camera
	OFF	

BSW ON INDICATOR

Test item	Operation	Description	Blind Spot Warning ON indicator lamp (Yellow)
BSW ON INDICATOR	Off	Stops transmitting the Blind Spot Warning ON indicator signal below to end the test	Off
	On	Transmits the Blind Spot Warning ON indicator signal to the warning lamp on the door	ON
Washer	Off	Stops transmitting activate signal to washer below to end the test	Off
	On	Transmits activate signal to washer	ON
Air pump	Off	Stops transmitting activate signal to air pump below to end the test	Off
	On	Transmits activate signal to air pump	ON

ECU IDENTIFICATION

ITS control unit part number is displayed.

CONFIGURATION

The specifications of the vehicle can be written and read in the ITS control unit when replaced.

ECU DIAGNOSIS INFORMATION

ITS CONTROL UNIT

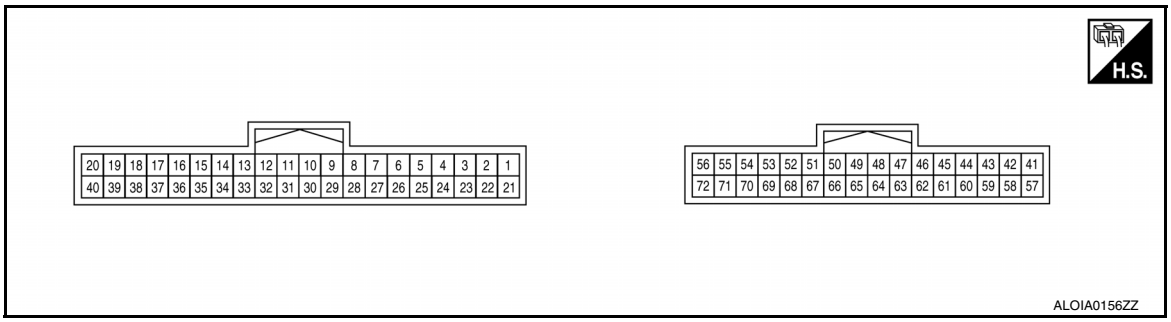
Reference Value

INFOID:0000000009951641

VALUES ON THE DIAGNOSIS TOOL

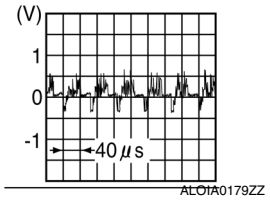
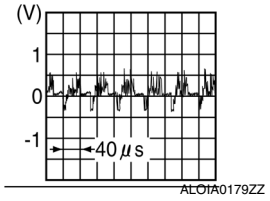
Monitor item	Condition		Value/Status
ST ANGLE SENSOR SIGNAL	Ignition switch ON	Steering angle signal is received	On
		Steering angle signal is not received	Off
REVERSE SIGNAL	Ignition switch ON	Shift selector in R (reverse)	On
		Shift selector is not in R (reverse)	Off
VEHICLE SPEED SIGNAL	While driving	Vehicle speed signal is received	On
		Vehicle speed signal is not received	Off
CAMERA SWITCH SIGNAL	Ignition switch ON	Camera switch is pressed	On
		Camera switch is not pressed	Off
CAMERA OFF SIGNAL	Ignition switch ON	Purpose switch is pressed	On
		Purpose switch is not pressed	Off
ST ANGLE SENSOR TYPE	Ignition switch ON	Steering angle sensor type is displayed	Absolute
		Steering angle sensor type is not received	Not
STEERING GEAR RATIO TYPE	Ignition switch ON	Pattern 1 type of steering gear ratio displayed	Pattern 1
		Pattern 2 type of steering gear ratio displayed	Pattern 2
STEERING POSITION	Ignition switch ON	It recognizes steering position is left	LHD
		It recognizes steering position is right	RHD
R-CAMERA COMM STATUS	Ignition switch ON	Rear camera serial status is OK	OK
		Rear camera serial status is not OK	NG
R-CAMERA COMM LINE	Ignition switch ON	Rear camera serial communication signal is received	OK
		Rear camera serial communication signal is not received	NG
ILL	Ignition switch ON	Illumination is ON	On
		Illumination is OFF	Off
ITS SW 1	Ignition switch ON	ITS switch is pressed	On
		ITS switch is not pressed	Off
ITS SW 1 IND	Ignition switch ON	Indicator of ITS switch 1 is lighting	On
		Indicator of ITS switch 1 is not lighting	Off
TURN SIGNAL	Ignition switch ON	Turn signal left is received	Left
		Turn signal neutral is received	N
		Turn signal right is received	Right
REAR CAMERA IMAGE SIGNAL	Ignition switch ON	Camera image signal is received	On
		Camera image signal is not received	Off
ITS SW 2	Ignition switch ON	For this vehicle, the displaying is fixed	No setting
ITS SW 2 IND	Ignition switch ON	For this vehicle, the displaying is fixed	No setting
WASH SW	Ignition switch ON	Wash switch signal is pressed	On
		Wash switch signal is not pressed	Off
PUMP COMM STATUS	Ignition switch ON	Pump communication signal is received	On
		Pump communication signal is not received	Off

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
1 (BR)	Ground	Washer level switch	Input	Ignition switch ON	When washer fluid is low (switch closed)	0 V
					When washer fluid is not low (switch open)	12 V
2 (G)	Ground	Washer signal pump to camera	Input	Ignition switch ON		5 V
3 (W)	Ground	Washer signal camera to pump	Output	Ignition switch ON		5 V
7 (P)	Ground	CAN -L	—	—	—	—
17 (G)	Ground	SOW LED signal R	Output	While driving	LDW/BSW detected	12 V
					LDW/BSW is not detected	0 V
20 (G)	Ground	Battery supply	Input	—	—	12 V
22 (P)	Ground	Serial ground	Output	—	—	0 V
27 (L)	Ground	CAN -H	—	—	—	—
28 (R)	Ground	Reverse	Input	Ignition switch ON	Shift selector in R (reverse)	12 V
					Shift selector not in R (reverse)	0 V
32 (P)	Ground	Cancel SW output	Input	Ignition switch ON	Cancel switch pressed	0 V
					Cancel switch not pressed	12 V
33 (BG)	Ground	LED input	Output	Ignition switch ON	Warning system is ON	12 V
					Warning system is OFF	0 V
37 (W)	Ground	SOW LED signal L	Output	While driving	LDW/BSW detected	12 V
					LDW/BSW is not detected	0 V
39 (BG)	Ground	Ignition power supply	Input	Ignition switch ON		Battery Voltage
40 (B)	Ground	Ground	—	—	—	0 V
50, 53	Ground	Shield	—	—	—	0 V
51 (R)	Ground	RR CAM GND	Output	Ignition switch ON	—	0 V

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	–	Signal name	Input/ Output		
52 (W)	Ground	RR CAM ON	Output	Ignition switch ON	6 V
66 (B)	Ground	RR CAM COMP +	Input	Ignition switch ON	
68 (G)	Ground	RR CAM CONT	Input	Ignition switch ON	5 V
69 (B)	Ground	RR CAM COMP +	Input	Ignition switch ON	

Fail-safe

INFOID:0000000009951642

If a malfunction occurs in each system, ITS control unit cancels each control, sounds a beep, and turns ON the warning lamp or indicator lamp.

System	Buzzer	Warning Indicator lamp	Description
Lane Departure Warning (LDW)	Low-pitched tone	Lane Departure Warning lamp	Cancel
Blind Spot Warning (BSW)	High-pitched tone	Blind Spot Warning lamp	Cancel
Moving Object Detection (MOD)	Low-pitched tone	Warning lamp MOD icon (on camera screen)	Cancel

DTC Inspection Priority Chart

INFOID:0000000009951643

If multiple DTCs are detected simultaneously, check them one by one depending on the following DTC inspection priority chart.

Priority	Detected items (DTC)
1	• U1000: CAN COMM CIRCUIT • U1010: CONTROL UNIT (CAN)
2	• U1305: CAMERA IMAGE CALIB • U1308: CAMERA CONFIG
3	• C1A39: STRG SEN CIR • U0428: STRG SEN CAN CIR 2 • U111A: REAR CAMERA IMAGE SIGNAL • U1232: ST ANGLE SEN CALIB • U1309: PUMP UNIT CURRENT • U130B: REAR CAMERA COMM ERROR • U1310: PUMP UNIT CIRCUIT
4	• C1A03: VHCL SPEED SE CIRC • C1A04: VDC FAIL • U0122: VDC P-RUN DIAG • U0416: VDC CHECKSUM DIAG

DTC Index

INFOID:0000000009951644

NOTE:
- The details of time display are as follows:
- CRNT: A malfunction is detected now
- PAST: A malfunction was detected in the past
- IGN counter is displayed on FFD (Freeze Frame Data).
- 0: The malfunctions that are detected now
  CAN communication system (U1000, U1010)
- 1 - 39: It increases like 0 → 1 → 2 ··· 38 → 39 after returning to the normal condition whenever the ignition switch OFF → ON. It returns to 0 when a malfunction is detected again in the process.
- If it is over 39, it is fixed to 39 until the self-diagnosis results are erased.
  Other than CAN communication system (Other than U1000, U1010)
- 1 - 49: It increases like 0 → 1 → 2 ··· 38 → 49 after returning to the normal condition whenever the ignition switch OFF → ON. It returns to 0 when a malfunction is detected again in the process.
- If it is over 49, it is fixed to 49 until the self-diagnosis results are erased.

Systems for fail-safe
- A: Lane Departure Warning (LDW)
- B: Blind Spot Warning (BSW)
- C: Moving Object Detection (MOD)

DTC		Warning lamp			Fail-safe	
CONSULT	CONSULT display	Lane Departure Warning	Blind Spot Warning	Moving Object Detection	System	Reference
C1A03	VHCL SPEED SE CIRC	ON	ON	ON	A, B, C	DAS-111
C1A04	VDC FAIL	ON	ON	ON	A, B, C	DAS-112
C1A39	STRG SEN CIR	ON	ON	ON	A, B, C	DAS-113
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED	NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED	—	—	—	—	—
U0122	VDC P-RUN DIAG	ON	ON	ON	A, B, C	DAS-114
U0416	VDC CHECKSUM DIAG	ON	ON	ON	A, B, C	DAS-115
U0428	STRG SEN CAN CIR 2	ON	ON	ON	A, B, C	DAS-116
U1000[NOTE]	CAN COMM CIRCUIT	ON	ON	ON	A, B, C	DAS-117
U1010	CONTROL UNIT (CAN)	ON	ON	ON	A, B, C	DAS-118
U111A	REAR CAMERA IMAGE SIGNAL	ON	ON	ON	A, B, C	DAS-119
U1232	ST ANGLE SEN CALIB	ON	ON	ON	A, B, C	DAS-121
U1305	CAMERA IMAGE CALIB	ON	ON	ON	A, B, C	DAS-122
U1308	CAMERA CONFIG	ON	ON	ON	A, B, C	DAS-123
U1309	PUMP UNIT CURRENT	ON	ON	ON	A, B, C	DAS-124
U130B	REAR CAMERA COMM ERROR	ON	ON	ON	A, B, C	DAS-127
U1310	PUMP UNIT CIRCUIT	ON	ON	ON	A, B, C	DAS-128

NOTE:
With the detection of “U1000” some systems do not perform the fail-safe operation.

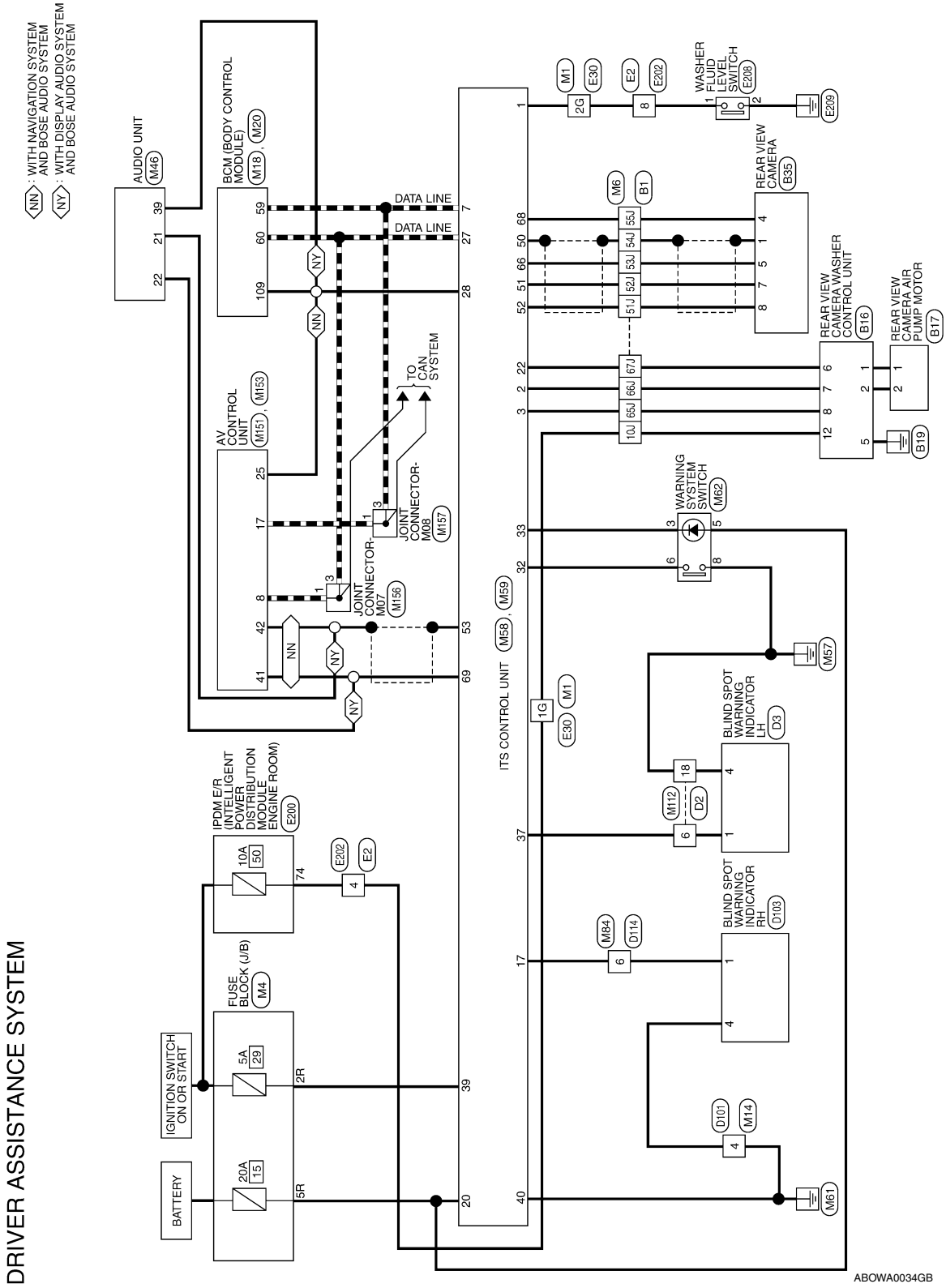
A system controlling based on a signal received from the control unit performs fail-safe operation when the communication with the ITS control unit becomes inoperable.

WIRING DIAGRAM

DRIVER ASSISTANCE SYSTEMS

Wiring Diagram

INFOID:0000000009464733



DRIVER ASSISTANCE SYSTEM CONNECTORS

Connector No.	M1
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	81G
82G	83G	84G	85G	86G	87G	88G	89G	90G		

91G	92G	93G	94G	95G
96G	97G	98G	99G	100G

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

Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
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
2R	BG	–
5R	G	–

Connector No.	M6
Connector Name	WIRE TO WIRE
Connector Color	GRAY

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	81J
82J	83J	84J	85J	86J	87J	88J	89J	90J		

91J	92J	93J	94J	95J
96J	97J	98J	99J	100J

Terminal No.	Color of Wire	Signal Name
10J	LG	–
51J	W	–
52J	R	–
53J	B	–
54J	SHIELD	–
55J	G	–
65J	W	–
66J	G	–
67J	P	–

ABOIA0115GB

Connector No.	M14
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1	2		3
4	5	6	7	8

Terminal No.	Color of Wire	Signal Name
4	GR	–

Connector No.	M18
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	BLACK

H.S.

60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41
80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64	63	62	61

Terminal No.	Color of Wire	Signal Name
59	P	CAN-L
60	L	CAN-H

Connector No.	M20
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	BLACK

H.S.

116	115	114	113	112	111	110	109	108	107	106	105
128	127	126	125	124	123	122	121	120	119	118	117

Terminal No.	Color of Wire	Signal Name
109	G	REVERSE SIGNAL

Connector No.	M46
Connector Name	AUDIO UNIT (WITH DISPLAY AUDIO SYSTEM AND BOSE AUDIO SYSTEM)
Connector Color	WHITE

H.S.

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52

Terminal No.	Color of Wire	Signal Name
21	SHIELD	COMPOSITE -
22	B	COMPOSITE +
39	G	REVERSE

ABOIA0116GB

Connector No.	M58
Connector Name	ITS CONTROL UNIT
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
1	BR	WASH LVL SW
2	G	FROM PUMP TO CAMERA C/U
3	W	FROM CAMERA C/U TO PUMP
4	–	–
5	–	–
6	–	–

Terminal No.	Color of Wire	Signal Name
7	P	CAN-L
8	–	–
9	–	–
10	–	–
11	–	–
12	–	–
13	–	–
14	–	–
15	–	–
16	–	–
17	G	SOW LED SIGNAL R
18	–	–
19	–	–
20	G	B+
21	–	–
22	P	SERIAL GND
23	–	–

Terminal No.	Color of Wire	Signal Name
24	–	–
25	–	–
26	–	–
27	L	CAN-H
28	R	REV
29	–	–
30	–	–
31	–	–
32	P	CANCEL SW OUTPUT
33	BG	LED INPUT
34	–	–
35	–	–
36	–	–
37	W	SOW LED SIGNAL L
38	–	–
39	BG	IGN
40	B	GND

Connector No.	M59
Connector Name	ITS CONTROL UNIT
Connector Color	WHITE

H.S.

56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41
72	71	70	69	68	67	66	65	64	63	62	61	60	59	58	57

Terminal No.	Color of Wire	Signal Name
41	–	–
42	–	–
43	–	–
44	–	–
45	–	–

Terminal No.	Color of Wire	Signal Name
46	–	–
47	–	–
48	–	–
49	–	–
50	SHIELD	–
51	R	RR CAM GND
52	W	RR CAM ON
53	SHIELD	–
54	–	–
55	–	–
56	–	–
57	–	–
58	–	–

Terminal No.	Color of Wire	Signal Name
59	–	–
60	–	–
61	–	–
62	–	–
63	–	–
64	–	–
65	–	–
66	B	RR CAM COMP +
67	–	–
68	G	RR CAM CONT
69	B	COMP OUT +
70	–	–
71	–	–
72	–	–

AAOIA0042GB

Connector No.	M62
Connector Name	WARNING SYSTEM SWITCH
Connector Color	GRAY

H.S.

4	3	2	1
8	7	6	5

Terminal No.	Color of Wire	Signal Name
3	BG	–
5	G	–
6	P	–
8	B	–

Connector No.	M84
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	17	18	19	20	21	22	23	24

Terminal No.	Color of Wire	Signal Name
6	G	–

Connector No.	M112
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	17	18	19	20	21	22	23	24

Terminal No.	Color of Wire	Signal Name
6	W	–
18	B	–

Connector No.	M151
Connector Name	AV CONTROL UNIT (WITH NAVIGATION SYSTEM WITH BOSE AUDIO SYSTEM)
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
8	L	CAN-H
17	P	CAN-L

Connector No.	M153
Connector Name	AV CONTROL UNIT (WITH NAVIGATION SYSTEM WITH BOSE AUDIO SYSTEM)
Connector Color	WHITE

H.S.

21	22	23	24	25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40	41	42	43	44

Terminal No.	Color of Wire	Signal Name
25	G	REVERSE
41	B	CAMERA +
42	SHIELD	CAMERA - (SHIELD)

Connector No.	M156
Connector Name	JOINT CONNECTOR-M07
Connector Color	WHITE

H.S.

4	3	2	1

Terminal No.	Color of Wire	Signal Name
1	L	–
3	L	–

ABOIA0117GB

Connector No.	M157
Connector Name	JOINT CONNECTOR-M08
Connector Color	WHITE

H.S.

4	3	2	1

Terminal No.	Color of Wire	Signal Name
1	P	–
3	P	–

Connector No.	E2
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1	2	3
4	5	6	7	8

Terminal No.	Color of Wire	Signal Name
4	BG	– (WITH REAR VIEW CAMERA)
8	R	–

Connector No.	E30
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1G	BG	– (WITH REAR VIEW CAMERA)
2G	R	–

Connector No.	E200
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE

H.S.

74	75	76
77	78	79	80	81

Terminal No.	Color of Wire	Signal Name
74	BG	WASH MTR (WITH REAR VIEW CAMERA)

ABOIA0118GB

Connector No.	E202
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

3		2	1
8	7	6	5	4

Terminal No.	Color of Wire	Signal Name
4	BG	– (WITH REAR VIEW CAMERA)
8	R	–

Connector No.	E208
Connector Name	WASHER FLUID LEVEL SWITCH
Connector Color	BLACK

H.S.

1	2

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

Connector No.	B1
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
10J	W	–
51J	W	–
52J	B	–
53J	R	–
54J	SHIELD	–
55J	G	–
65J	W	–
66J	G	–
67J	P	–

Connector No.	B16
Connector Name	REAR VIEW CAMERA WASHER CONTROL UNIT
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
1	V	PUMP MOTOR +
2	BR	PUMP MOTOR -
5	B	GND
6	P	SERIAL GND
7	G	FROM PUMP TO CAMERA C/U
8	W	FROM CAMERA C/U TO PUMP
12	W	IGN

ABOIA0119GB

Connector No.	B17
Connector Name	REAR VIEW CAMERA AIR PUMP MOTOR
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	V	–
2	BR	–

Connector No.	B35
Connector Name	REAR VIEW CAMERA
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	SHIELD	–
4	G	–
5	R	–
7	B	–
8	W	–

Connector No.	D2
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
6	P	–
18	B	–

Connector No.	D3
Connector Name	BLIND SPOT WARNING INDICATOR LH
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	P	–
4	B	–

Connector No.	D101
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
4	B	–

Connector No.	D103
Connector Name	BLIND SPOT WARNING INDICATOR RH
Connector Color	WHITE

H.S.

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

ABOIA0120GB

Connector No.	D114
Connector Name	WIRE TO WIRE
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
6	R	–

ABOIA0121GB

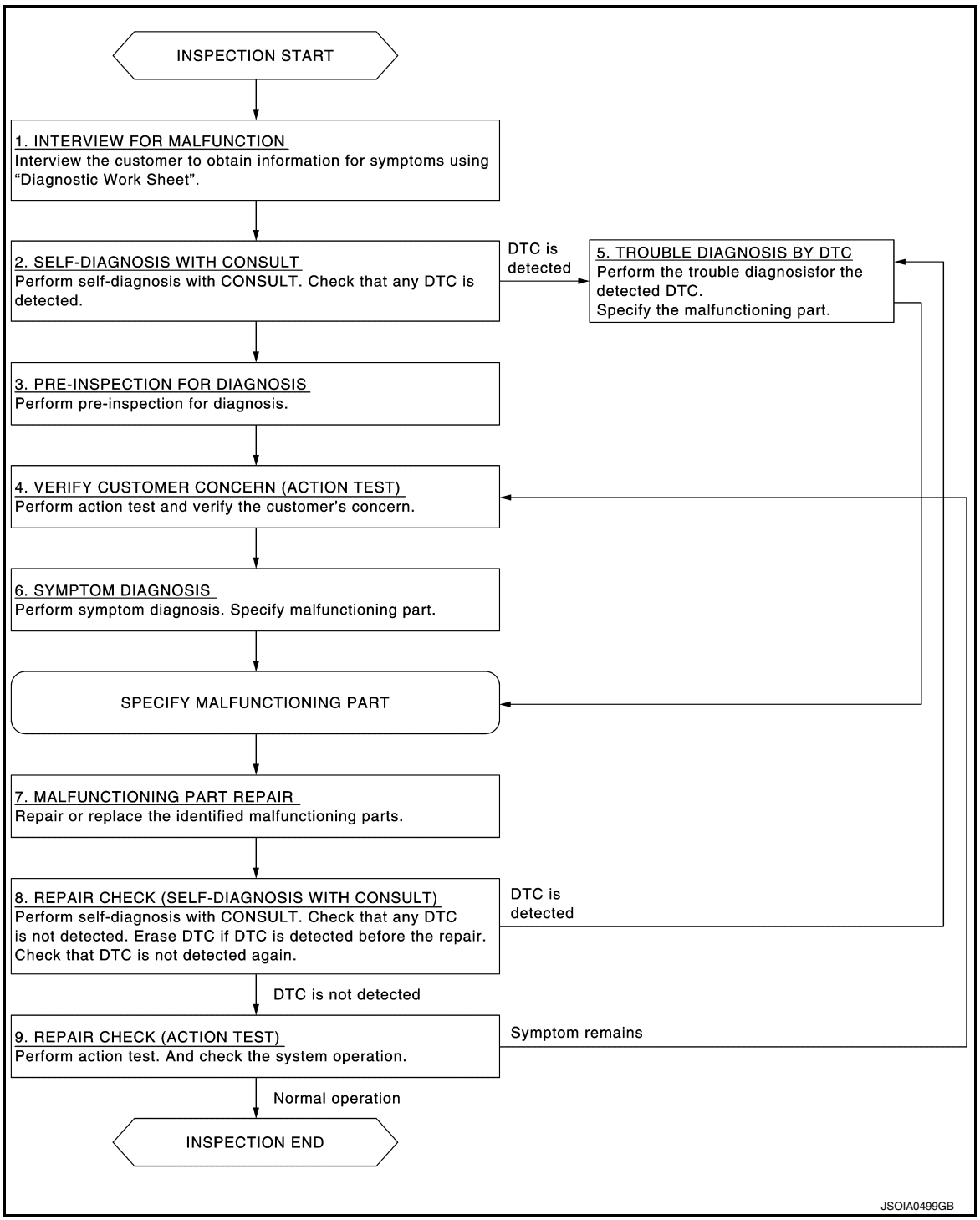
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000009464734

OVERALL SEQUENCE



DETAILED FLOW

1.INTERVIEW FOR MALFUNCTION

Interview the customer to obtain information about symptoms using “Diagnostic Work Sheet”. (Refer to DAS-101, "Diagnostic Work Sheet".)

>> GO TO 2.

2.SELF-DIAGNOSIS WITH CONSULT

1. Perform “All DTC Reading” with CONSULT.
2. Check if the DTC is detected on the self-diagnosis results of “AVM”.

Is any DTC detected?

YES >> GO TO 5.
NO >> GO TO 3.

3.PRE-INSPECTION FOR DIAGNOSIS

Perform pre-inspection for diagnosis. Refer to DAS-103, "Inspection Procedure".

>> GO TO 4.

4.ACTION TEST

Perform LDW system action test to check the operation status. Refer to DAS-104, "Description".

>> GO TO 6.

5.TROUBLE DIAGNOSIS BY DTC

Perform trouble diagnosis for the detected DTC. Specify a malfunctioning part. Refer to DAS-89, "DTC Index" (ITS CONTROL UNIT).

>> GO TO 7.

6.SYMPTOM DIAGNOSIS

Perform symptom diagnosis. Specify malfunctioning part. Refer to DAS-137, "Symptom Table".

>> GO TO 7.

7.MALFUNCTION PART REPAIR

Repair or replace the identified malfunctioning parts.

>> GO TO 8.

8.REPAIR CHECK (SELF-DIAGNOSIS WITH CONSULT)

Perform self-diagnosis with CONSULT. Check that any DTC is not detected. Erase DTC if DTC is detected before the repair. Check that DTC is not detected again.

Is any DTC detected?

YES >> GO TO 5.
NO >> GO TO 9.

9.REPAIR CHECK (ACTION TEST)

Perform LDW system action test. Also check the system operation.

Does it operate normally?

YES >> Inspection End.
NO >> GO TO 4.

Diagnostic Work Sheet

INFOID:0000000009464735

DESCRIPTION

In general, each customer feels differently about an incident. It is important to fully understand the symptoms or conditions for a customer complaint.
There are many operating conditions that lead to the malfunction. A good grasp of such conditions can make troubleshooting faster and more accurate.
Some conditions may cause the lane departure warning lamp to stay ON.

Utilize a work sheet sample to organize all of the information for troubleshooting.

KEY POINTS
- WHAT..... System and functions
- WHEN..... Date, Frequencies
- WHERE..... Road conditions
- HOW..... Operating conditions, Symptoms

WORK SHEET SAMPLE

Customer name MR/MS	Model and Year	VIN
Engine #	Trans.	Mileage
Incident Date	Manuf. Date	In Service Date

Symptoms			
Indicator/Warning lamps	☐ Lane departure warning lamp	☐ Stays ON ☐ Stays OFF ☐ Blinks ☐ Turned ON occasionally ☐ Others ( )	
	☐ Warning systems ON indicator	☐ Stays ON	☐ Stays OFF ☐ Blinks ☐ Others ( )
	☐ Other lamps ( )	☐ Stays ON ☐ Stays OFF ☐ Blinks ☐ Turned ON occasionally ☐ Others ( )	
Functions	☐ When using LDW		
	☐ All functions do not operate. ☐ Warning function does not operate. (☐ No sound ☐ No indicator) ☐ Yawing function does not operate. (Warning function is operated.) ☐ Functions when changing the course in the turn signal direction. ☐ Functions are untimely. ☐ Does not function when driving on lane markers. ☐ Functions when driving in a lane. ☐ Functions in a different position from the actual position. ☐ Others ( )		

Conditions			
Frequency	☐ Continuously	☐ Intermittently	
Light conditions	☐ Not affected ☐ In the daytime ☐ Direct light	☐ At night ☐ Backlight	☐ Sunrise/sunset (Strong light) ☐ Others ( )
Driving conditions	☐ Not affected ☐ Vehicle speed	MPH (km/h)	☐ Vehicle is stopped
Weather conditions	☐ Not affected ☐ Fine ☐ Clouding	☐ Raining	☐ Snowing ☐ Others ( )
Road conditions	☐ Not affected ☐ Highway ☐ Uneven roads	☐ In town ☐ Winding roads	☐ Others ( )
Lane maker conditions	☐ Not affected ☐ Clear	☐ Unclear	☐ Others ( )
Other conditions			

ALOIA0189GB

PRE-INSPECTION FOR DIAGNOSIS

Inspection Procedure

INFOID:0000000009464736

1.CHECK CAMERA LENS

Is camera lens contaminated with foreign materials?

YES >> Clean camera lens.
NO >> GO TO 2.

2.CHECK REAR VIEW CAMERA UNIT INSTALLATION CONDITION

Check rear view camera unit installation condition (installation position, properly fitted).

Is it properly installed?

YES >> GO TO 3.
NO >> Install rear view camera unit properly, and perform rear view camera calibration. Refer to DAS-107, "Description".

3.CHECK VEHICLE HEIGHT

Check vehicle height. Refer to FSU-26, "Wheelarch Height (Unladen*1)".

Is vehicle height appropriate?

YES >> Inspection End.
NO >> Repair vehicle to appropriate height.

ACTION TEST

Description

INFOID:0000000009464737

- Perform action test to verify the customer's concern.
- Perform action test and check the system operation after system diagnosis.

WARNING:
Be careful of traffic conditions and safety around the vehicle when performing road test.
CAUTION:
• Fully understand the following items well before the road test;
- Precautions: Refer to DAS-73, "Precaution for LDW System Service".
- System description for LDW: Refer to DAS-77, "System Description".
- System description for BSW: Refer to DAS-152, "System Description".
- System description for MOD: Refer to DAS-228, "System Description".
- Handling precaution: Refer to DAS-82, "Precautions for Lane Departure Warning".

Inspection Procedure

INFOID:0000000009464738

WARNING:
Be careful of traffic conditions and safety around the vehicle when performing road test.
CAUTION:
• Fully understand the following items well before the road test;
- Precautions: Refer to DAS-73, "Precaution for LDW System Service".
- System description for LDW: Refer to DAS-77, "System Description".
- System description for BSW: Refer to DAS-152, "System Description".
- System description for MOD: Refer to DAS-228, "System Description".
- Handling precaution: Refer to DAS-232, "Precautions for Moving Objects Detection".

1.CHECK LDW SYSTEM SETTING

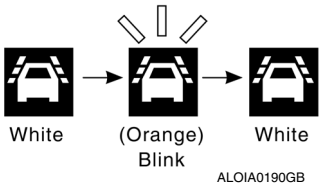
1. Start the engine.
2. Check that the LDW system setting can be enabled/disabled on the vehicle information display.
3. Turn OFF the ignition switch and wait for 30 seconds or more.
4. Check that the previous setting is saved when the engine starts again.

>> GO TO 2.

2.ACTION TEST FOR LDW

1. Enable the setting of the LDW system on the vehicle information display.
2. Turn warning systems switch ON (warning systems ON indicator is ON).
3. Check the LDW operation according to the following table.

Vehicle condition/ Driver's operation		Action	Warning systems ON indicator	Indication on the combination meter	Buzzer
Less than Approx. 60 km/h (40 MPH)	Close to lane marker	No action	ON	 White ALOIA0191GB	—

Vehicle condition/ Driver's operation		Action	Warning systems ON indicator	Indication on the combination meter	Buzzer
Approx. 70 km/h (45 MPH) or more	Close to lane marker	Warning • Buzzer sounds • Warning lamp blinks	ON	 ALOIA0190GB	Short continuous beeps
	• Close to lane marker • Turn signal ON (Deviate side)	No action	ON	 White ALOIA0191GB	—

NOTE:
After the operating conditions of warning are satisfied, the warning continues until the vehicle speed reaches approximately 60 km/h (40 MPH). Refer to DAS-77, "System Description".

>> Inspection End.

ADDITIONAL SERVICE WHEN REPLACING REAR VIEW CAMERA

Description

INFOID:0000000009464739

Always perform the calibration after removing and installing or replacing the rear view camera.

CAUTION:

The system does not operate normally unless the rear view camera aiming adjustment is performed. Always perform it.

Work Procedure

INFOID:0000000009464740

1.CAMERA AIMING ADJUSTMENT

Perform the camera aiming adjustment with CONSULT. Refer to DAS-107, "Description".

>> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

Perform the self-diagnosis of rear view camera with CONSULT. Check if any DTC is detected.

Is any DTC detected?

YES >> Perform the trouble diagnosis for the detected DTC. Refer to DAS-89, "DTC Index".
NO >> GO TO 3.

3.LDW/BSW SYSTEM ACTION TEST

1. Perform the LDW/BSW system action test. Refer to DAS-104, "Description".
2. Check that the LDW/BSW system operates normally.

Is the inspection result normal?

YES >> Inspection End.
NO >> GO TO 4.

4.LDW/BSW ACTIVE TEST

1. Perform WASH ACTIVE on Active Test using CONSULT.
2. Perform air and washer tube connection check by AIR & WASH ACTIVE on Active Test:

(1) Washer fluid output count on the rear view camera is 3 to 5 times → OK
(2) Washer fluid output count on the rear view camera is 10 times → Check tube with yellow marking
(3) Washer fluid output count on the rear view camera is 1 time → Check tube with green marking
(4) No washer fluid output → Check tube with blue marking or check valve

>> Inspection End.

REAR VIEW CAMERA CALIBRATION

Description

INFOID:0000000009464741

Always perform the calibration after removing and installing or replacing the rear view camera.

CAUTION:

- **Place the vehicle on level ground when the calibration is performed.**
- **Follow the CONSULT when performing the calibration. (Rear view camera calibration cannot be operated without CONSULT).**

Work Procedure (Preparation)

INFOID:0000000009464742

1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis of the ITS control unit.

Is any DTC detected?

Except "U1308">> Perform diagnosis on the detected DTC and repair or replace the applicable item. Refer to DAS-89, "DTC Index".

"U1308" or no DTC>>GO TO 2.

2.PREPARATION BEFORE REAR VIEW CAMERA CALIBRATION

NOTE:

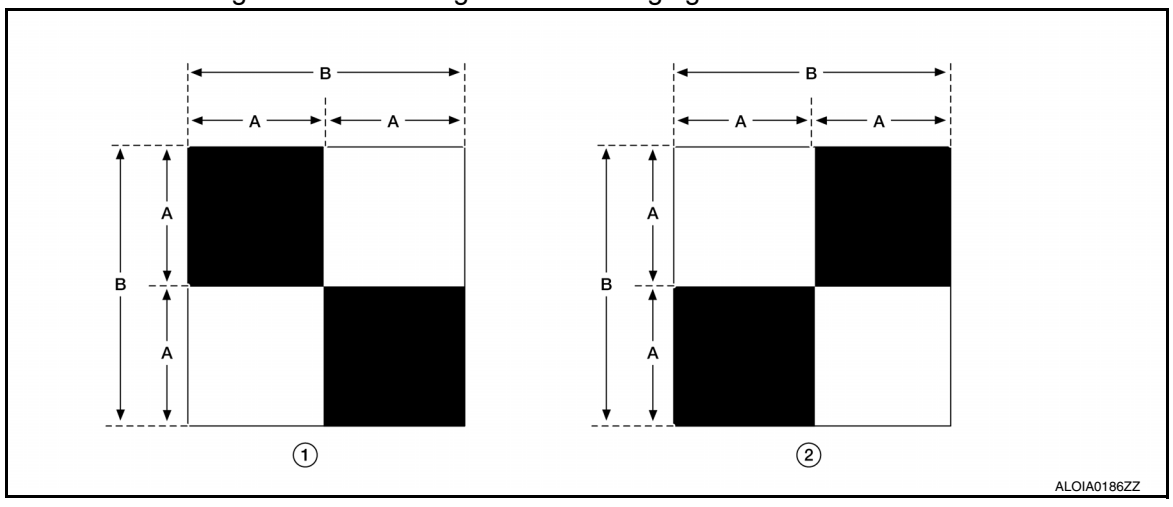
Select the "AVM" to diagnose the ITS control unit by CONSULT.

1. Perform pre-inspection for diagnosis. Refer to DAS-103, "Inspection Procedure".
2. Adjust the tire pressure to the specified pressure value.
3. Maintain no-load in vehicle.
4. Check if coolant and engine oil are filled up to correct level and fuel tank is full.
5. Situate vehicle where the camera is exposed at an atmosphere temperature between 0°C (32°F) and 30°C (86°F)
6. Move the shift selector to P (Park) and release the parking brake.
7. Clean the rear view camera.

>> GO TO 3.

3.PREPARATION OF CALIBRATION TARGET MARK

Prepare the calibration target mark according to the following figure:



(1) : Left and right targets

(2) : Center target

(A) : Side of the black or white area = 200 mm (7.87 in)

(B) : Side of the square target = 400 mm (15.75 in)

>> Refer to DAS-108, "Work Procedure (Target Setting)".

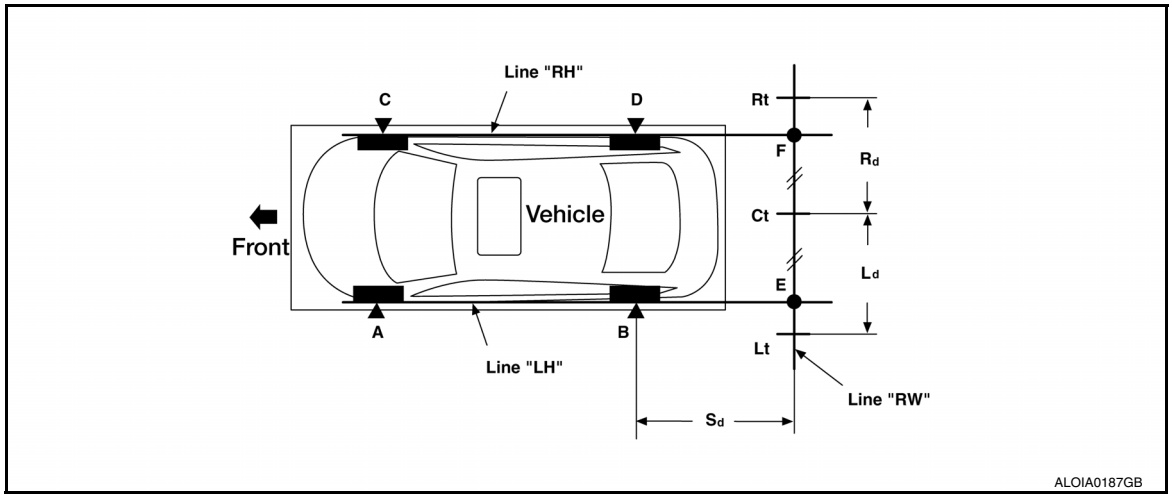
Work Procedure (Target Setting)

INFOID:0000000009464743

CAUTION:

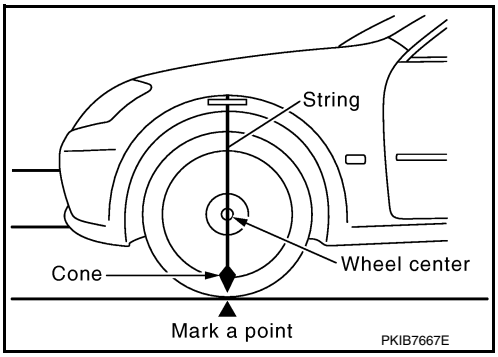
- **Perform this operation in a horizontal position where there is a clear view for 3 m (9.84 ft) backward and 4 m (13.12 ft) wide.**
- **Place the target in a well-lighted location. (Poor lighting may make it hard to adjust.)**
- **The target may not be detected when it shines by the reflected light of the sun or lighting.**
- **The target may not be detected when there is the same pattern of black and white as the target when the pattern is within 0.5 m (1.64 ft) from either side and upward/downward position from the target. (It is desirable that the vehicle is positioned on a single-color floor.)**

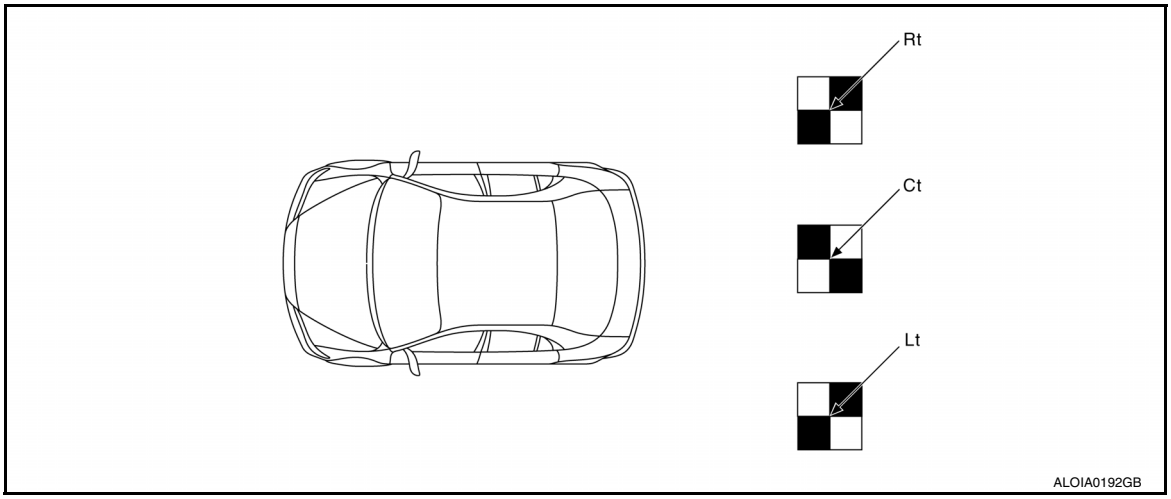
1. TARGET SETTING



Side distance (S_d): "B"–"E" ("D"–"F") : 2125 mm (83.66 in)
Left distance (L_d): "C_t"–"L_t" : 1500 mm (59.06 in)
Right distance (R_d): "C_t"–"R_t" : 1500 mm (59.06 in)

1. Mark points "A", "B", "C" and "D" at the center of the lateral surface of each wheel.
   NOTE:
   Hang a string with a cone from the fender so as to pass through the center of wheel, and then mark a point at the center of the lateral surface of the wheel.
2. Draw line "LH" passing through points "A" and "B" on the left side of vehicle.
   NOTE:
   Approximately 2.2 m (7.22 ft) or more at the rear from the rear axle.
3. Mark point "E" on the line "LH" at the positions 2125 mm (83.66 in) from point "B".
4. Draw line "RH" passing through points "C" and "D" on the right side of vehicle in the same way as step 2.
5. Mark point "F" on the line "RH" at the positions 2125 mm (83.66 in) from point "D".
6. Draw line "RW" passing through the points "E" and "F" on the rear of the vehicle.
   NOTE:
   Approximately 1.8 m (5.91 ft) or more at both left and right sides from vehicle center.
7. Mark point "C_t" at the center of point "E" and "F" on the line "RW".
   CAUTION:
   Make sure that "E" to "C_t" is equal to "F" to "C_t".
8. Mark point "Lt" and "Rt" on the line "RW" at the positions 1500 mm (59.06 in) from point "Ct".
9. Position the center of the target mark to point of "C_t".





CAUTION:
Make sure that the black/white pattern of the center target is rotated as compared with the left and right targets.

>> Go to DAS-109, "Work Procedure (Rear View Camera Calibration)".

Work Procedure (Rear View Camera Calibration)

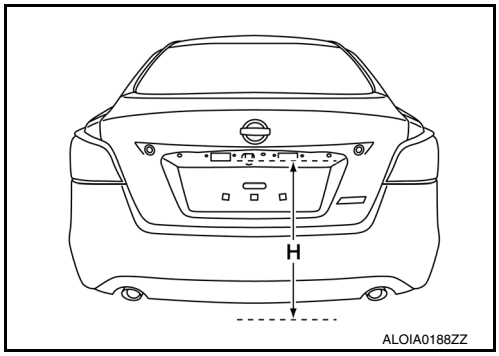
INFOID:0000000009464744

CAUTION:
Perform the calibration under the specified vehicle condition (fuel full, no-load, specified tire pressure, etc.). Refer to DAS-107, "Work Procedure (Preparation)".

1.CHECK REAR VIEW CAMERA HEIGHT

Measure the rear view camera height “H”.

>> GO TO 2.



2.REAR VIEW CAMERA CALIBRATION

1. Select “Work Support” on “AVM” with CONSULT.
2. Select “REAR CAMERA ITS”.
3. Select "OK".
   CAUTION:
   - **Perform the calibration after the ignition or engine has been kept on for at least 10 minutes to stabilize camera.**
   - **Operate CONSULT outside the vehicle, and close all doors to retain appropriate vehicle altitude.**
4. Input the rear view camera height "H", and then touch "APPLY".
5. Confirm that the same value is displayed on the center display.
6. Confirm the following items:

- The target should be accurately placed.
- The vehicle should be stopped.
- The vehicle should be under the specified vehicle condition.

7. Select “Start” to perform calibration.
8. Confirm the displayed item.

- “Completed”: Select “Completion”.
- Otherwise, perform the following services:

Displayed item		Possible cause	Service procedure
SUSPENSION	—	Temporary malfunction in internal processing of the rear view camera.	Go back to Step 1
	00H Routine not activated	Rear view camera unit malfunction.	Position the target appropriately again. Perform the aiming again. Refer to DAS-108, "Work Procedure (Target Setting)".
	10H Writing error	• Temporary malfunction in internal processing of the rear view camera. • Rear view camera malfunction.	
X AIMING NG Y (X: 0 - 7, Y: 1 - 8)	—	• A target is not-yet-placed. (The rear view camera cannot detect a target.) • The position of the rear view camera is not correct. • Inappropriate work environment. • Inappropriate vehicle condition.	Position the target appropriately again. Perform the aiming again. Refer to DAS-107, "Work Procedure (Preparation)".
ABNORMALLY COMPLETED	—		

NOTE:
Replace camera unit if “00H Routine not activated” or “10H Writing error” are repeatedly indicated during the above two services are performed.

9. Confirm that “Completed” is displayed and then select “End” to close the calibration procedure.

>> GO TO 3.

3.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis of ITS control unit with CONSULT.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the applicable item. Refer to DAS-89, "DTC Index".

NO >> GO TO 4.

4.ACTION TEST

Test the system operation by action test. Refer to DAS-104, "Description".

>> Work End.

DTC/CIRCUIT DIAGNOSIS

C1A03 VEHICLE SPEED SENSOR

DTC Logic

INFOID:0000000009464745

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
C1A03	VHCL SPEED SEN CIRC	ITS control unit detects that the result of calculation about velocity has error.	• ABS actuator and electric unit (control unit) • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the "C1A03" is detected as the current malfunction in "Self Diagnostic Result" of "AVM".

Is “C1A03” detected as the current malfunction?

YES >> Refer to DAS-111, "Diagnosis Procedure".
NO >> Refer to GI-43, "Intermittent Incident".

Diagnosis Procedure

INFOID:0000000009464746

1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts. Refer to BRC-45, "DTC Index".
NO >> GO TO 2.

2.CHECK ALL UNIT SELF-DIANOSIS RESULTS

Check if any DTC is detected except for ITS control unit about VDC in "ALL DTC READING" with CONSULT.

Is any DTC detected except for ITS?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-128, "Removal and Installation".
NO >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".

C1A04 ABS/TCS/VDC SYSTEM

DTC Logic

INFOID:0000000009464747

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
C1A04	VDC CIRCUIT	ITS control unit receives the message that means "VDC is failed" from ABS actuator and electric unit (control unit).	• ABS actuator and electric unit (control unit) • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the "C1A04" is detected as the current malfunction in "Self Diagnostic Result" of "AVM".

Is “C1A04” detected as the current malfunction?

YES >> Refer to DAS-112, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000009464748

1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts. Refer to BRC-45, "DTC Index".
NO >> GO TO 2.

2.CHECK ALL UNIT SELF-DIANOSIS RESULTS

Check if any DTC is detected except for ITS control unit about VDC in "ALL DTC READING" with CONSULT.

Is any DTC detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-128, "Removal and Installation".
NO >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".

C1A39 STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000009464749

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
C1A39	STRG SEN CIR	ITS control unit receives the message that means "Steering angle sensor is failed" from steering angle sensor.	• Steering angle sensor • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the "C1A39" is detected as the current malfunction in "Self Diagnostic Result" of "AVM".

Is “C1A39” detected as the current malfunction?

YES >> Refer to DAS-113, "Diagnosis Procedure".
NO >> Refer to GI-43, "Intermittent Incident".

Diagnosis Procedure

INFOID:0000000009464750

1.CHECK STRG SENSOR SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts. Refer to BRC-45, "DTC Index".
NO >> GO TO 2.

2.CHECK ALL UNIT SELF-DIANOSIS RESULTS

Check if any DTC is detected except for ITS control unit about ABS in "ALL DTC READING" with CONSULT.

Is any DTC detected except for ITS?

YES >> Replace steering angle sensor. Refer to BRC-132, "Removal and Installation".
NO >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".

U0122 VDC P-RUN DIAG

DTC Logic

INFOID:0000000009464751

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U0122	VDC P-RUN DIAG	ITS control unit receives the incorrect signal about P-RUN from VDC via V-CAN communication	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U0122” is detected as the current malfunction in self-diagnosis results of “AVM”.

Is “U0122” detected as the current malfunction?

YES >> Refer to DAS-114, "Diagnosis Procedure".
NO >> Refer to GI-43, "Intermittent Incident".

Diagnosis Procedure

INFOID:0000000009464752

1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts.
NO >> GO TO 2.

2.CHECK ITS CONTROL UNIT SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts.
NO >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-128, "Removal and Installation".

U0416 VDC CHECKSUM DIAG

DTC Logic

INFOID:0000000009464753

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U0416	VDC CHECKSUM DIAG	ITS control unit receives the incorrect signal about P-RUN from VDC via V-CAN communication	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U0416” is detected as the current malfunction in self-diagnosis results of “AVM”.

Is “U0416” detected as the current malfunction?

YES >> Refer to DAS-115, "Diagnosis Procedure".
NO >> Refer to GI-43, "Intermittent Incident".

Diagnosis Procedure

INFOID:0000000009464754

1.CHECK VDC UNIT SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts.
NO >> GO TO 2.

2.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts.
NO >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-128, "Removal and Installation".

U0428 STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000009464755

DTC	Display contents of CONSULT	DTC detection condition	Possible malfunction factor
U0428	ST ANGLE SENSOR CALIBRATION [U0428]	The neutral position adjustment of the steering angle sensor is incomplete.	Adjust neutral position of the steering angle sensor.

Diagnosis Procedure

INFOID:0000000009464756

1.ADJUST THE NEUTRAL POSITION OF THE STEERING ANGLE SENSOR

When U1232 is detected, adjust the neutral position of the steering angle sensor.

>> Perform adjustment of the neutral position of the steering angle sensor. Refer to BRC-33, "CONSULT Function (ABS)".

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000009464757

CAN COMMUNICATION

CAN (Controller Area Network) is a serial communication line for real time applications. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Modern vehicle is equipped with many electronic control units, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H, CAN-L) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads the required data only.
CAN communication signal chart. Refer to LAN-32, "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart".

ITS COMMUNICATION

- ITS communication is a multiplex communication system. This enables the system to transmit and receive large quantities of data at high speed by connecting control units with 2 communication lines.
- ITS communication lines adopt twisted-pair line style (two lines twisted) for noise immunity.

DTC Logic

INFOID:0000000009464758

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1000	CAN COMM CIRCUIT	If ITS control unit is not transmitting or receiving CAN communication signal or ITS communication signal for 2 seconds or more	• CAN communication system • ITS communication system

NOTE:
If “U1000” is detected, first diagnose the CAN communication system.

Diagnosis Procedure

INFOID:0000000009464759

1.PERFORM THE SELF-DIAGNOSIS

1. Turn the ignition switch ON.
2. Turn the MAIN switch of ITS system ON, and then wait for 30 seconds or more.
3. Perform “All DTC Reading” with CONSULT.
4. Check if the “U1000” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U1000” detected as the current malfunction?

YES >> Refer to DAS-117, "Description".
NO >> Refer to GI-43, "Intermittent Incident".

U1010 CONTROL UNIT (CAN)

Description

INFOID:0000000009464760

CAN controller controls the communication of CAN communication signal and ITS communication signal, and the error detection.

DTC Logic

INFOID:0000000009464761

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1010	CONTROL UNIT (CAN)	If ITS control unit detects malfunction by CAN controller initial diagnosis	ITS control unit

Diagnosis Procedure

INFOID:0000000009464762

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn the MAIN switch of ITS system ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U1010” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U1010” detected as the current malfunction?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Inspection End.

U111A REAR CAMERA IMAGE SIGNAL CIRCUIT

DTC Logic

INFOID:0000000009464763

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U111A	REAR CAMERA IMAGE SIGNAL	Rear camera image signal circuit is open or shorted	Check rear camera image signal circuit between rear camera and around view monitor control unit.

Diagnosis Procedure

INFOID:0000000009464764

Regarding Wiring Diagram information, refer to DAS-91, "Wiring Diagram".

1.CHECK CONTINUITY REAR CAMERA POWER SUPPLY AND GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect the ITS control unit connector and rear camera connector.
3. Check for continuity between ITS control unit harness connector and rear camera harness connector.

ITS control unit		Rear Camera		Continuity
Connector	Terminal	Connector	Terminal	
M59	51	B35	7	Yes
	52		8	

4. Check for continuity between ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M59	52		No

Is the inspection result normal?

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

2.CHECK VOLTAGE REAR CAMERA POWER SUPPLY

1. Connect the ITS control unit connector and rear camera connector.
2. Turn the ignition switch ON.
3. Check voltage between ITS control unit harness connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
ITS control unit				
Connector	Terminal			
M59	52	Ground	"CAMERA" switch is ON or shift selector is in R (Reverse)	6.2 V

Is inspection result normal?

YES >> GO TO 3.
NO >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".

3.CHECK CONTINUITY REAR CAMERA IMAGE SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect the ITS control unit connector and rear camera connector.
3. Check for continuity between ITS control unit harness connector and rear camera harness connector.

ITS control unit		Rear View Camera		Continuity
Connector	Terminal	Connector	Terminal	
M59	50	B35	1	Yes
	66		5	

4. Check for continuity between ITS control unit harness connector and ground.

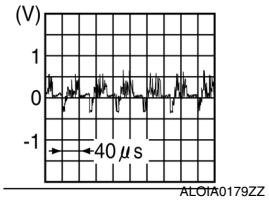
ITS control unit		Ground	Continuity
Connector	Terminal		
M59	50		No
	66		

Is inspection result normal?

YES >> GO TO 4.
NO >> Repair harness or connector.

4.CHECK REAR CAMERA IMAGE SIGNAL

1. Connect the ITS control unit connector and rear camera connector.
2. Turn the ignition switch ON.
3. Using an oscilloscope, check voltage between ITS control unit harness connector terminals.

Terminal				Condition	Voltage (Approx.)
(+)		(–)			
ITS control unit					
Connector	Terminal	Connector	Terminal		
M59	66	M59	50	"CAMERA" switch is ON or shift selector is in R (Reverse)	

Is inspection result normal?

YES >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Replace rear view camera. Refer to DAS-143, "Removal and Installation".

U1232 STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000009464765

DTC	Display contents of CONSULT	DTC detection condition	Possible malfunction factor
U1232	ST ANGLE SEN CALIB	The neutral position registration of the steering angle sensor cannot finish.	• Steering angle sensor • ITS control unit

Diagnosis Procedure

INFOID:0000000009464766

1.REGISTER THE NEUTRAL POSITION OF THE STEERING ANGLE SENSOR

1. Turn the ignition switch ON.
2. Perform registration of the neutral position of the steering angle sensor. Refer to DAS-83, "CONSULT Function (AVM)".
3. Check “Self Diagnostic Result” of “AVM” with CONSULT. Refer to DAS-83, "CONSULT Function (AVM)".

Is “ST ANGLE SEN CALIB” detected?

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

2.CHECK STEERING ANGLE SENSOR

Check steering angle sensor.

Is the inspection result normal?

YES >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

U1305 CAMERA IMAGE CALIB

DTC Logic

INFOID:0000000009464767

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1305	CAMERA CONFIG	ITS control unit configuration is incomplete	Perform ITS configuration with CONSULT

Diagnosis Procedure

INFOID:0000000009464768

1.CHECK SELF-DIAGNOSIS RESULTS

Check if “U1305” is current in “Self Diagnostic Result” of “AVM”.

Is “U1305” detected?

YES >> Perform ITS configuration using CONSULT. Refer to DAS-83, "CONSULT Function (AVM)". If problem persists, repair or replace the malfunctioning part.

NO >> Refer to GI-43, "Intermittent Incident".

U1308 CAMERA CONFIG

DTC Logic

INFOID:0000000009464769

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1308	ITS CALIB [U1308]	ITS control unit calibration is incomplete	Perform ITS calibration with CONSULT

Diagnosis Procedure

INFOID:0000000009464770

1.CHECK SELF-DIAGNOSIS RESULTS

Check if “U1308” is current in “Self Diagnostic Result” of “AVM”.

Is “U1308” detected?

YES >> Perform ITS calibration of camera image using CONSULT. Refer to DAS-83, "CONSULT Function (AVM)".

NO >> Refer to GI-43, "Intermittent Incident".

U1309 PUMP UNIT CURRENT

DTC Logic

INFOID:0000000009464771

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1309	PUMP UNIT CURRENT	ITS control unit detects the value of current from pump control unit is incorrect	• Rear view camera washer control unit • Harness • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U1309” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U1309” detected as the current malfunction?

YES >> Refer to DAS-124, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000009464772

Regarding Wiring Diagram information, refer to DAS-91, "Wiring Diagram".

1.CHECK REAR VIEW CAMERA AIR PUMP MOTOR POWER SUPPLY CIRCUIT

1. Disconnect the rear view camera washer control unit connector.
2. Turn the ignition switch ON.
3. Check voltage between rear view camera washer control unit connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
Rear view camera washer control unit				
Connector	Terminal			
B16	12	Ground	Ignition ON	12 V

Is inspection result normal?

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

2.CHECK REAR VIEW CAMERA AIR PUMP MOTOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Check for continuity between rear view camera washer control unit connector and ground.

Rear view camera washer control unit		Ground	Continuity
Connector	Terminal		
B16	5		Yes

Is the inspection result normal?

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

3.CHECK CONTINUITY ITS CONTROL UNIT TO REAR VIEW CAMERA WASHER CONTROL UNIT

1. Disconnect the ITS control unit connector.

2. Check for continuity between ITS control unit harness connector and rear view camera washer control unit connector.

ITS control unit		Rear view camera washer control unit		Continuity
Connector	Terminal	Connector	Terminal	
M58	2	B16	7	Yes
	3		8	

3. Check for continuity between ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	2		No
	3		

Is inspection result normal?

YES >> GO TO 4.
NO >> Repair the harness or connector.

4. CHECK CONTINUITY REAR VIEW CAMERA WASHER CONTROL UNIT TO PUMP

1. Disconnect rear view camera air pump connector.
2. Check for continuity between rear view camera washer control unit connector and pump connector.

Rear view camera washer control unit		Rear view camera air pump motor		Continuity
Connector	Terminal	Connector	Terminal	
B16	1	B17	1	Yes
	2		2	

3. Check for continuity between rear view camera washer control unit connector and ground.

Rear view camera washer control unit		Ground	Continuity
Connector	Terminal		
B16	1		No
	2		

Is inspection result normal?

YES >> GO TO 5.
NO >> Repair the harness or connector.

5. CHECK REAR VIEW CAMERA AIR PUMP MOTOR ITS CONTROL UNIT SUPPLY CIRCUIT

Momentarily connect a jumper from a fused battery positive to terminal 1 and from ground to terminal 2 of the rear view camera air pump motor.

Does the pump operate?

YES >> GO TO 6.
NO >> Replace the rear view camera air pump motor.

6. CHECK REAR VIEW CAMERA AIR PUMP MOTOR ITS CONTROL UNIT SUPPLY CIRCUIT

1. Reconnect the ITS control unit connector.
2. Turn the ignition switch ON.
3. Using CONSULT, activate the rear view camera air pump while checking voltage between rear view camera washer control unit connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
Rear view camera washer control unit				
Connector	Terminals			
B16	7, 8	Ground	Activating pump	5 V

Can voltage be measured on either terminal?

YES >> Replace rear view camera washer control unit.
NO >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".

U130B REAR CAMERA COMM ERROR

DTC Logic

INFOID:0000000009464773

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U130B	REAR CAMERA COMM ERROR	ITS control unit receives the incorrect communication signal from rear view camera.	• Rear view camera • Harness • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U130B” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U130B” detected as the current malfunction?

YES >> Refer to DAS-127, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000009464774

Regarding Wiring Diagram information, refer to DAS-91, "Wiring Diagram".

1.CONNECTOR CHECK

Check the ITS control unit and rear view camera connectors for the following:
- Proper connection
- Damage
- Disconnected or loose terminals

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair the terminal and connector.

2.CHECK REAR VIEW CAMERA VOLTAGE

1. Connect ITS control unit and rear view camera harness connectors.
2. Check voltage between ITS control unit connector M59 and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
ITS control unit				
Connector	Terminal			
M59	68	Ground	Ignition ON	5 V

Is the inspection result normal?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Replace rear view camera. Refer to DAS-143, "Removal and Installation".

U1310 PUMP UNIT CIRCUIT

DTC Logic

INFOID:0000000009464775

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1310	PUMP UNIT CIRCUIT	ITS control unit detects the value of voltage from pump control unit is incorrect	• Rear view camera washer control unit • Harness • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U1310” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U1310” detected as the current malfunction?

YES >> Refer to DAS-128, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000009464776

Regarding Wiring Diagram information, refer to DAS-91, "Wiring Diagram".

1.CHECK REAR VIEW CAMERA AIR PUMP MOTOR POWER SUPPLY CIRCUIT

1. Disconnect the rear view camera washer control unit connector.
2. Turn the ignition switch ON.
3. Check voltage between rear view camera washer control unit connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
Rear view camera washer control unit				
Connector	Terminal			
B16	12	Ground	Ignition ON	Battery voltage

Is inspection result normal?

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

2.CHECK REAR VIEW CAMERA AIR PUMP MOTOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Check for continuity between rear view camera washer control unit connector and ground.

Rear view camera washer control unit		Ground	Continuity
Connector	Terminal		
B16	5		Yes

Is the inspection result normal?

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

3.CHECK CONTINUITY ITS CONTROL UNIT TO REAR VIEW CAMERA WASHER CONTROL UNIT

1. Disconnect the ITS control unit connector.

2. Check for continuity between ITS control unit harness connector and rear view camera washer control unit connector.

ITS control unit		Rear view camera washer control unit		Continuity
Connector	Terminal	Connector	Terminal	
M58	2	B16	7	Yes
	3		8	

3. Check for continuity between ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	2		No
	3		

Is inspection result normal?

YES >> GO TO 4.
NO >> Repair the harness or connector.

4. CHECK CONTINUITY REAR VIEW CAMERA WASHER CONTROL UNIT TO PUMP

1. Disconnect rear view camera air pump connector.
2. Check for continuity between rear view camera washer control unit connector and pump connector.

Rear view camera washer control unit		Rear view camera air pump motor		Continuity
Connector	Terminal	Connector	Terminal	
B16	1	B17	1	Yes
	2		2	

3. Check for continuity between rear view camera washer control unit connector and ground.

Rear view camera washer control unit		Ground	Continuity
Connector	Terminal		
B16	1		No
	2		

Is inspection result normal?

YES >> GO TO 5.
NO >> Repair the harness or connector.

5. CHECK REAR VIEW CAMERA AIR PUMP MOTOR ITS CONTROL UNIT SUPPLY CIRCUIT

Momentarily connect a jumper from a fused battery positive to terminal 1 and from ground to terminal 2 of the rear view camera air pump motor.

Does the pump operate?

YES >> GO TO 6.
NO >> Replace the rear view camera air pump motor.

6. CHECK REAR VIEW CAMERA AIR PUMP MOTOR ITS CONTROL UNIT SUPPLY CIRCUIT

1. Reconnect the ITS control unit connector.
2. Turn the ignition switch ON.
3. Activate the rear view camera air pump while checking voltage between rear view camera washer control unit connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
Rear view camera washer control unit				
Connector	Terminals			
B16	7, 8	Ground	Activating pump	5 V

Can voltage be measured on either terminal?

YES >> Replace rear view camera washer control unit.
NO >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:0000000009464777

Regarding Wiring Diagram information, refer to DAS-91, "Wiring Diagram".

1.CHECK ITS CONTROL UNIT POWER SUPPLY CIRCUIT

Check voltage between ITS control unit harness connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
ITS control unit		Ground	Ignition switch	
Connector	Terminal			
M58	20		OFF	Battery voltage
			ON	Battery voltage
	39		OFF	0 V
			ON	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair the ITS control unit power supply circuit.

2.CHECK ITS CONTROL UNIT GROUND CIRCUIT

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

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	40		Yes

Is the inspection result normal?

YES >> Inspection End.
NO >> Repair the ITS control unit ground circuit.

WARNING SYSTEMS SWITCH CIRCUIT

Component Function Check

INFOID:0000000009464778

1.CHECK WARNING SYSTEMS SWITCH INPUT SIGNAL

1. Turn the ignition switch ON.
2. Select the DATA MONITOR item “ITS SW 1” of “AVM” with CONSULT.
3. With operating the warning systems switch, check the monitor status.

Monitor item	Condition	Monitor status
ITS SW 1	Warning systems switch is pressed	On
	Warning systems switch is not pressed	OFF

Is the inspection result normal?

YES >> Warning systems switch circuit is normal.
NO >> Refer to DAS-132, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000009464779

Regarding Wiring Diagram information, refer to DAS-91, "Wiring Diagram".

1.CHECK WARNING SYSTEMS SWITCH SIGNAL INPUT

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

Terminals			Condition	Voltage (Approx.)
(+)		(−)		
ITS control unit		Ground	Warning systems switch	
Connector	Terminal			
M58	32		Pressed	0 V
			Released	12 V

Is the inspection result normal?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> GO TO 2.

2.CHECK WARNING SYSTEMS SWITCH

1. Turn ignition switch OFF.
2. Remove warning systems switch.
3. Check warning systems switch. Refer to DAS-133, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace the warning systems switch. Refer to DAS-142, "Removal and Installation".

3.CHECK WARNING SYSTEMS SWITCH GROUND CIRCUIT

Check continuity between warning system switch harness connector terminal and ground.

Warning system switch		Ground	Continuity
Connector	Terminal		
M62	8		Yes

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4. CHECK WARNING SYSTEMS SWITCH SIGNAL INPUT CIRCUIT FOR OPEN

1. Disconnect the ITS control unit connector.
2. Check continuity between the ITS control unit harness connector and warning system switch harness connector.

ITS control unit		Warning system switch		Continuity
Connector	Terminal	Connector	Terminal	
M58	32	M62	6	Yes

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair the harnesses or connectors.

5. CHECK WARNING SYSTEMS SWITCH SIGNAL INPUT CIRCUIT FOR SHORT

Check continuity between the ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	32		No

Is the inspection result normal?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Repair the harnesses or connectors.

Component Inspection

INFOID:0000000009464780

1. CHECK WARNING SYSTEMS SWITCH

Check continuity of warning systems switch.

Terminal		Condition	Continuity
6	8	When warning systems switch is pressed	Yes
		When warning systems switch is released	No

Is the inspection result normal?

YES >> Inspection End.
NO >> Replace the warning systems switch. Refer to DAS-142, "Removal and Installation".

WARNING SYSTEMS ON INDICATOR CIRCUIT

Component Function Check

INFOID:0000000009464781

1.CHECK WARNING SYSTEMS ON INDICATOR

1. Turn the ignition switch ON.
2. Select the active test item “BSW ON INDICATOR” of “AVM” with CONSULT.
3. With operating the test item, check the operation.

On : Warning systems ON indicator illuminates
Off : Warning systems ON indicator is turned OFF

Is the inspection result normal?

YES >> Inspection End.
NO >> Refer to DAS-134, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000009464782

Regarding Wiring Diagram information, refer to DAS-91, "Wiring Diagram".

1.CHECK WARNING ON INDICATOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect warning system switch connector.
3. Turn ignition switch ON.
4. Check voltage between warning system switch harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(−)	
Warning system switch		Ground	
Connector	Terminal		
M62	5		Battery voltage

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair the warning systems ON indicator power supply circuit.

2.CHECK WARNING SYSTEMS ON INDICATOR SIGNAL FOR OPEN

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

ITS control unit		Warning system switch		Continuity
Connector	Terminal	Connector	Terminal	
M58	33	M62	3	Yes

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair the harnesses or connectors.

3.CHECK WARNING SYSTEMS ON INDICATOR SIGNAL CIRCUIT FOR SHORT

Check continuity between the ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	33		No

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair the harnesses or connectors.

4. CHECK WARNING SYSTEMS ON INDICATOR

Check the warning systems ON indicator. Refer to DAS-135, "Component Inspection".

Is the inspection result normal?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Replace warning systems switch. DAS-142, "Removal and Installation".

Component Inspection

INFOID:0000000009464783

1. CHECK WARNING SYSTEMS ON INDICATOR

Apply battery voltage to warning systems switch terminals 3 and 5, and then check if the warning systems ON indicator illuminates.

Terminals		Condition	Warning systems ON indicator
(+)	(-)		
5	3	When the battery voltage is applied	On
		When the battery voltage is not applied	Off

Is the inspection result normal?

YES >> Inspection End.
NO >> Replace the warning systems switch. Refer to DAS-142, "Removal and Installation".

WARNING BUZZER CIRCUIT

Component Function Check

INFOID:0000000009464784

1.CHECK WARNING BUZZER

1. Turn the ignition switch ON.
2. Select the active test item “BUZZER” of “BCM” with CONSULT.
3. With operating the test item, check the operation.

On : Warning buzzer is activated.
Off : Warning buzzer is not activated.

Is the inspection result normal?

YES >> Inspection End.
NO >> Refer to DAS-136, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000009464785

1.CHECK WARNING BUZZER OPERATION

While activating the buzzer with CONSULT, listen for the buzzer sound.

Does warning buzzer sound?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Replace the combination meter (buzzer).

SYMPTOM DIAGNOSIS

LDW SYSTEM SYMPTOMS

Symptom Table

INFOID:0000000009464786

NOTE:
For the operational conditions of Lane Departure Warning (LDW), refer to the following description.
- LDW: DAS-77, "System Description"

Symptom		Possible cause	Inspection item/Reference page
Indicator/warning lamps do not illuminate when ignition switch OFF ⇒ ON	Lane departure warning lamp (orange) does not illuminate.	• Combination meter • ITS control unit	Lane departure warning lamp does not turn ON Refer to DAS-138, "Description"
	Warning systems ON indicator does not illuminate.	• Harness between ITS control unit and warning systems switch • Warning systems switch • ITS control unit	Warning systems ON indicator circuit Refer to DAS-134, "Component Function Check"
	Lane departure warning lamp (orange) ON indicator lamp (white) does not illuminate.	• Combination meter • ITS control unit	• Lane departure warning lamp does not turn ON Refer to DAS-138, "Description"
	All of indicator/warning lamps does not illuminate; • Lane departure warning lamp (orange) • Warning systems ON indicator	• Power supply and ground circuit of ITS control unit • ITS control unit	Power supply and ground circuit of ITS control unit Refer to DAS-131, "Diagnosis Procedure"
LDW system is not activated. (Indicator/warning lamps illuminate when ignition switch OFF ⇒ ON)	Warning systems ON indicator is not turned ON ⇔ OFF when operating warning systems switch	• Harness between ITS control unit and warning systems switch • Harness between warning systems switch and ground • Warning systems switch • ITS control unit	• Warning systems switch circuit Refer to DAS-132, "Component Function Check" • LDW system setting cannot be turned ON/OFF on the navigation screen Refer to DAS-140, "Diagnosis Procedure"
	Warning buzzer is not sounding. (Lane departure warning lamp is activated.)	• Warning buzzer • ITS control unit	Refer to DAS-136, "Component Function Check"
Warning functions are not timely (Example) • Does not function when driving on lane markers • Functions when driving in a lane • Functions in a different position from the actual position.		• Lane camera unit • ITS control unit	Camera calibration DAS-107, "Description"
Functions when changing the course in direction of the turn signal		Turn indicator signal (CAN) • BCM • ITS control unit	System operates even when using turn signal . Refer to DAS-139, "Description"

LANE DEPARTURE WARNING LAMP DOES NOT TURN ON

Description

INFOID:0000000009464787

The lane departure warning lamp in the combination meter does not turn ON when turning on the ignition switch

Diagnosis Procedure

INFOID:0000000009464788

1.CHECK LANE DEPARTURE WARNING LAMP

1. Check that “LANE DEPARTURE W/L” operates normally in “ACTIVE TEST” of “AVM”.
2. Operate the test items to check that the lane departure warning lamp blinks

Is the inspection result normal?

YES >> GO TO 4.
NO >> GO TO 2.

2.CHECK COMBINATION METER

Turn the ignition switch from OFF to ON to check that “LANE W/L” included in “DATA MONITOR” in “METER/M&A” operates normally.

Is the inspection result normal?

YES >> Replace the combination meter. Refer to MWI-82, "Removal and Installation".
NO >> GO TO 3.

3.CHECK SELF-DIAGNOSIS RESULTS OF COMBINATION METER

1. Perform “All DTC Reading” with CONSULT.
2. Check if the DTC is detected in self-diagnosis results of “METER/M&A”. Refer to MWI-27, "DTC Index".

Is any DTC detected?

YES >> Repair or replace malfunctioning parts.
NO >> GO TO 4.

4.CHECK SELF-DIAGNOSIS RESULTS OF ITS CONTROL UNIT

Check if the DTC is detected in self-diagnosis results of “AVM”. Refer to DAS-89, "DTC Index".

Is any DTC detected?

YES >> Repair or replace malfunctioning parts.
NO >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".

THE SYSTEM OPERATES EVEN WHEN USING TURN SIGNAL

Description

INFOID:0000000009464789

The warning of Lane Departure Warning (LDW) is activated during the use of a turn signal.

NOTE:

For the operational conditions of Lane Departure Warning (LDW), refer to DAS-77, "System Description".

Diagnosis Procedure

INFOID:0000000009464790

1.CHECK TURN SIGNAL OPERATION

Check that both right and left turn signals are operational.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace malfunctioning parts. Refer to DAS-137, "Symptom Table".

2.CHECK SELF-DIAGNOSIS RESULTS

1. Perform “All DTC Reading” with CONSULT.
2. Check if the DTC is detected in self-diagnosis results of “AVM” Refer to DAS-89, "DTC Index".

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts.

NO >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".

LDW SYSTEM SETTINGS CANNOT BE TURNED ON/OFF IN VEHICLE INFORMATION DISPLAY

Description

INFOID:0000000009464791

- LDW system setting is not selectable on the navigation screen.
- **NOTE:**
  When the ignition switch is in ACC position, LDW system setting cannot be changed.
- "Lane Departure Warning" is not indicated on the navigation screen.
- The switching between ON and OFF cannot be performed by operating the navigation system.
- The item of "Lane Departure Warning" on the navigation screen is not active.
- After turning ON the ignition switch or starting the engine, LDW setting of the navigation system cannot be selected for several tens of seconds under the following conditions:
- After replacing AV control unit.
- After erasing connection history of the navigation system.
- After erasing self-diagnosis results of AV control unit.
- The LDW or LDP system setting differs from the one set at the previous driving.
  NOTE:
  Turn OFF the ignition switch and wait for 5 seconds or more.

Diagnosis Procedure

INFOID:0000000009464792

1.CHECK LDW SYSTEM SETTING

1. Start the engine.
2. Check that the LDW system settings is selectable on the navigation screen.

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 2.

2.PERFORM THE SELF-DIAGNOSIS

1. Perform "All DTC Reading" with CONSULT.
2. Check if the DTC is detected in self-diagnosis results of "AVM", "MULTI AV" and "METER/M&A". Refer to the following.

- AVM: DAS-89, "DTC Index"
- MULTI AV (with BOSE): AV-328, "DTC Index"
- MULTI AV (without BOSE): AV-231, "DTC Index"
- METER/M&A: MWI-27, "DTC Index"

Is any DTC detected?

YES >> Repair or replace malfunctioning parts.
NO >> Inspection End.

3.CHECK DATA MONITOR OF ITS CONTROL UNIT

Check that "LDW SELECT" operates normally in "DATA MONITOR" of "AVM" with CONSULT.

Is the inspection result normal?

YES >> Refer to DAS-83, "CONSULT Function (AVM)".
NO >> GO TO 4.

4.CHECK MULTIFUNCTION SWITCH

Operate the multifunction switch to check that the audio, navigation system, and air conditioner operate properly.

Is the inspection result normal?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

NORMAL OPERATING CONDITION

Description

INFOID:0000000009464793

PRECAUTIONS FOR LANE DEPARTURE WARNING (LDW)

- LDW system is only a warning device to inform the driver of a potential unintended lane departure. It will not steer the vehicle or prevent loss of control. It is the driver's responsibility to stay alert, drive safely, keep the vehicle in the traveling lane, and be in control of the vehicle at all times.
- LDW system will not operate at speeds below approximately 70 km/h (45 MPH) or if it cannot detect lane markers.
- Excessive noise will interfere with the warning chime sound, and the chime may not be heard.
- LDW system may not function properly under the following conditions:
  - On roads where there are multiple parallel lane markers; lane markers that are faded or not painted clearly; yellow painted lane markers; non-standard lane markers; or lane markers covered with water, dirt or snow, etc.
  - On roads where the discontinued lane markers are still detectable.
  - On roads where there are sharp curves.
  - On roads where there are sharply contrasting objects, such as shadows, snow, water, wheel ruts, seams or lines remaining after road repairs. (The LDW system could detect these items as lane markers.)
  - On roads where the traveling lane merges or separates.
  - When the vehicle's traveling direction does not align with the lane marker.
  - When traveling close to other vehicle in front of the vehicle, which obstructs the lane camera unit detection range.
  - When rain, snow or dirt adheres to the windshield in front of the lane camera unit.
  - When a sudden change in brightness occurs. (For example, when the vehicle enters or exits a tunnel or under a bridge.)

REMOVAL AND INSTALLATION

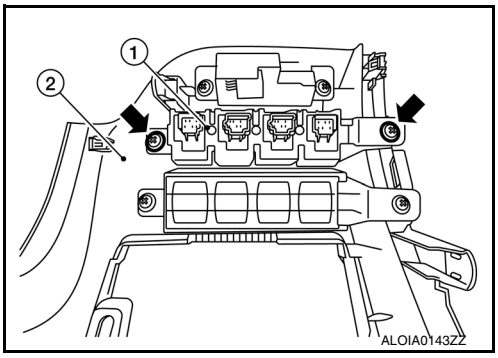
WARNING SYSTEMS SWITCH

Removal and Installation

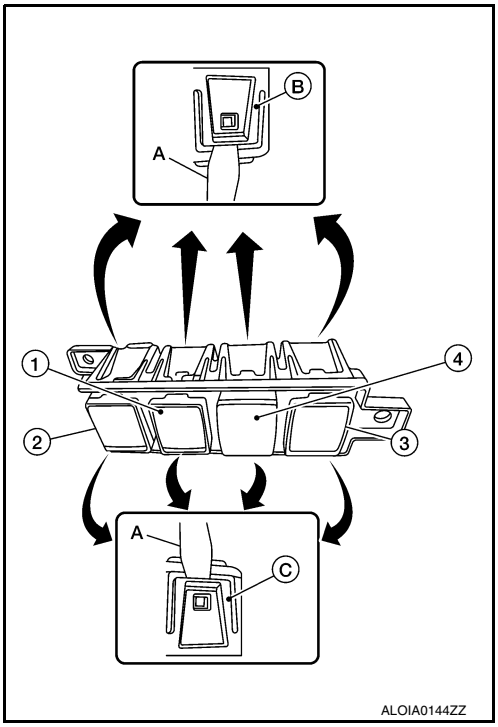
INFOID:0000000009464796

REMOVAL

1. Remove the instrument lower panel LH. Refer to IP-21, "Removal and Installation".
2. Remove screws (⬅) that retain the upper switch carrier (1) to the instrument lower panel LH (2).



3. Release upper tab (B) and lower tab (C) using a suitable tool (A), then remove the warning system switch (4) from the upper switch carrier.
   (1) Trunk opener switch
   (2) VDC switch
   (3) Heated steering wheel switch



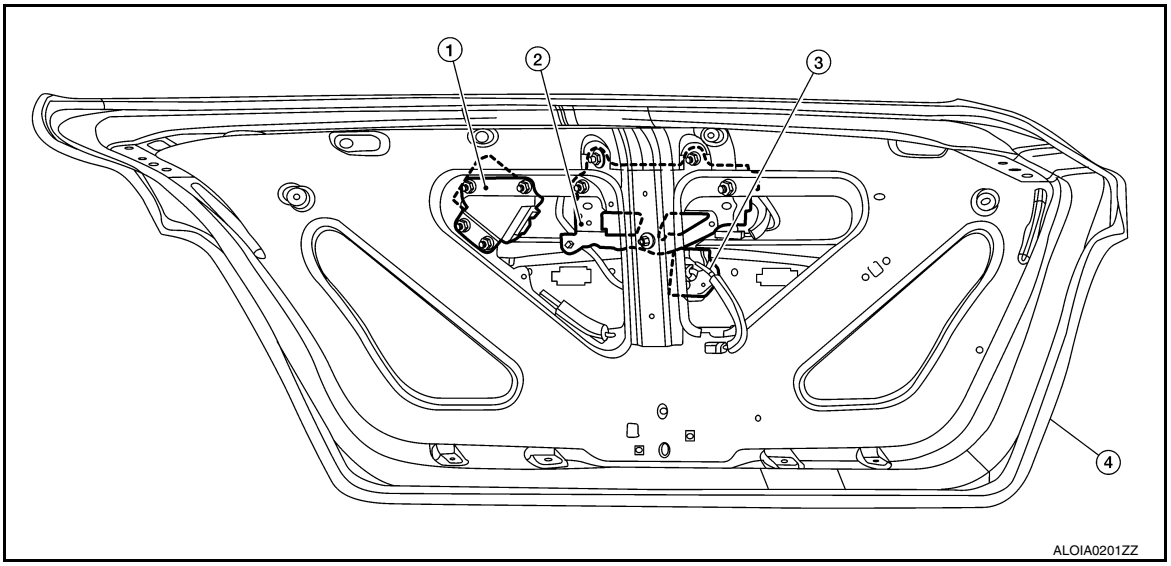
INSTALLATION

Installation is in the reverse order of removal.

REAR VIEW CAMERA

Exploded View

INFOID:0000000009978535



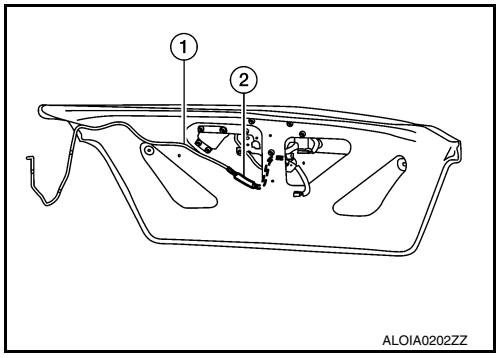
1. Rear view camera washer control unit
2. Rear view camera air pump motor
3. Rear view camera
4. Trunk lid

Removal and Installation

INFOID:0000000009978536

REMOVAL

1. Remove rear view camera air pump motor. Refer to DAS-145, "Removal and Installation".
2. Disconnect the rear washer tube (1) from rear view camera (2).



3. Disconnect the harness connector from the rear view camera and remove.

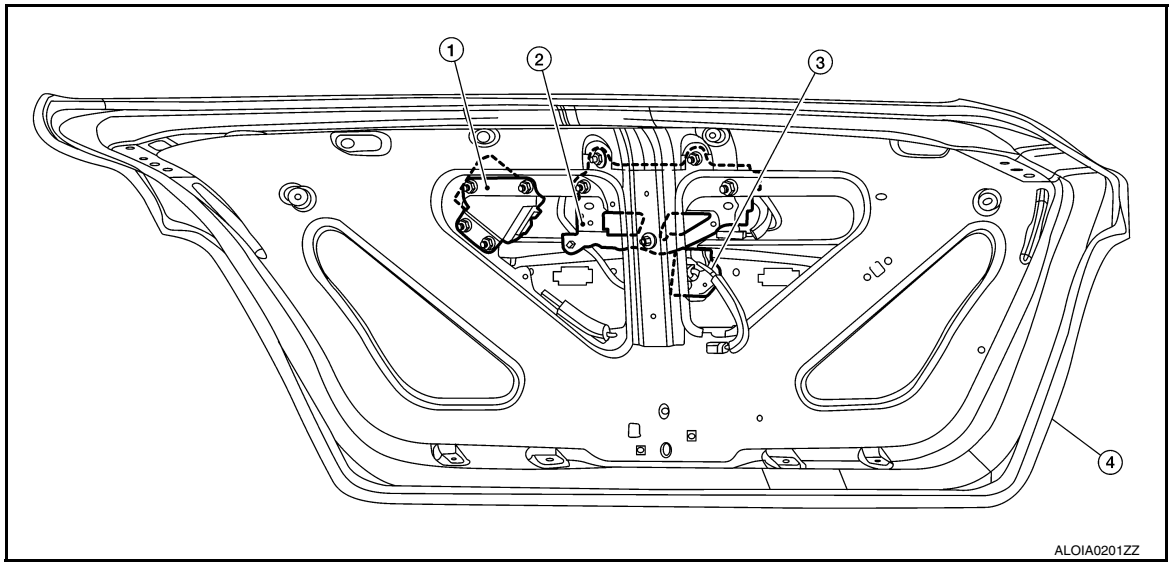
INSTALLATION

Installation is in the reverse order of removal.

REAR VIEW CAMERA WASHER CONTROL UNIT

Exploded View

INFOID:0000000009978537



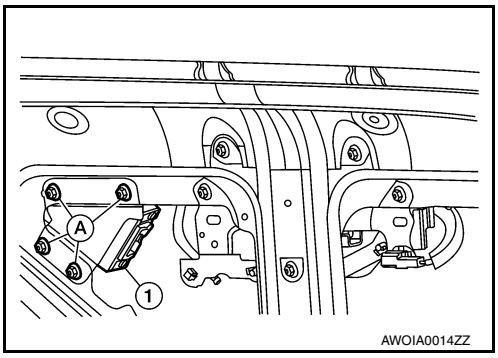
1. Rear view camera washer control unit
2. Rear view camera air pump motor
3. Rear view camera
4. Trunk lid

Removal and Installation

INFOID:0000000009978538

REMOVAL

1. Remove the trunk lid finisher. Refer to INT-33, "TRUNK LID FINISHER : Removal and Installation".
2. Disconnect the harness connector from the rear view camera washer control unit.
3. Remove the rear view camera washer control unit nuts (A).
4. Remove the rear view camera washer control unit (1).



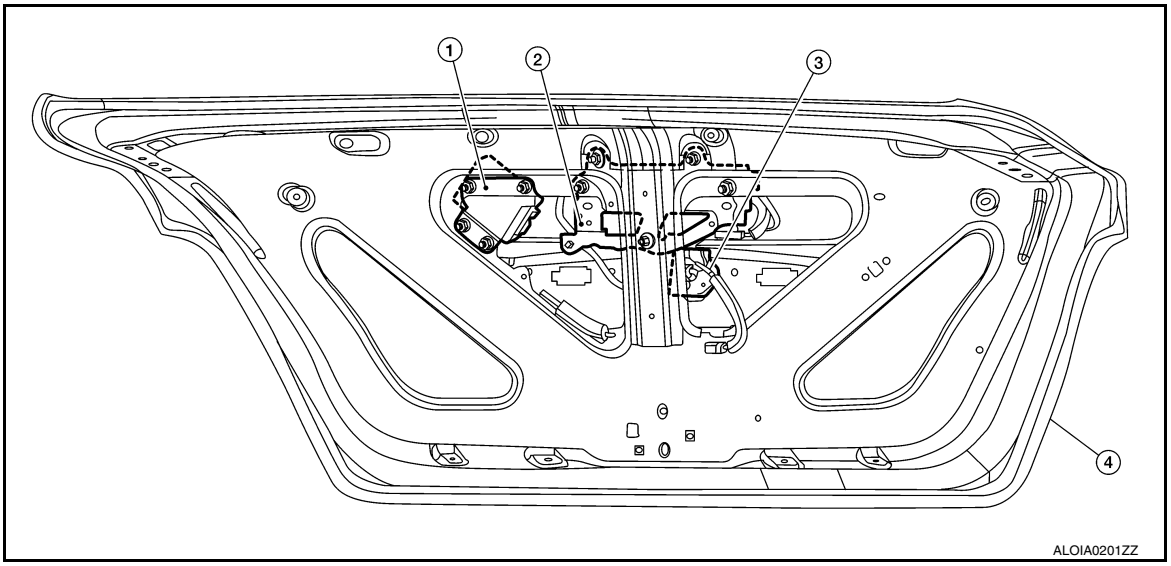
INSTALLATION

Installation is in the reverse order of removal.

REAR VIEW CAMERA AIR PUMP MOTOR

Exploded View

INFOID:0000000009978539



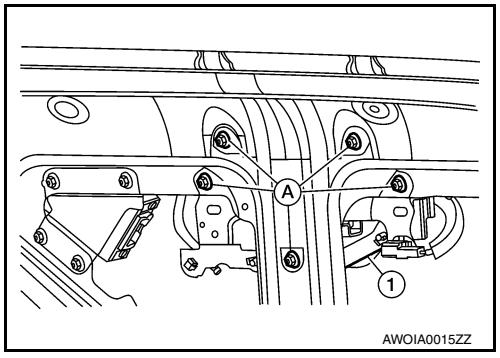
1. Rear view camera washer control unit
2. Rear view camera air pump motor
3. Rear view camera
4. Trunk lid

Removal and Installation

INFOID:0000000009978540

REMOVAL

1. Remove the trunk lid finisher. Refer to INT-33, "TRUNK LID FINISHER : Removal and Installation".
2. Disconnect the air tubes from the rear view camera air pump motor.
3. Disconnect the harness connector from the rear view camera air pump motor.
4. Remove the rear view camera air pump motor bracket nuts (A).
5. Remove the rear view camera air pump motor (1).



INSTALLATION

Installation is in the reverse order of removal.

PRECAUTION

PRECAUTIONS

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

INFOID:0000000009951647

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, 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 three minutes before performing any service.**

Precaution for Work

INFOID:0000000009464801

- 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.

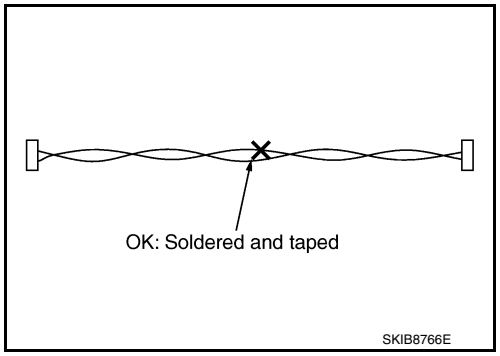
- Do not use organic solvent such as thinner, benzene, alcohol or gasoline.
- For genuine leather seats, use a genuine leather seat cleaner.

Precautions For Harness Repair

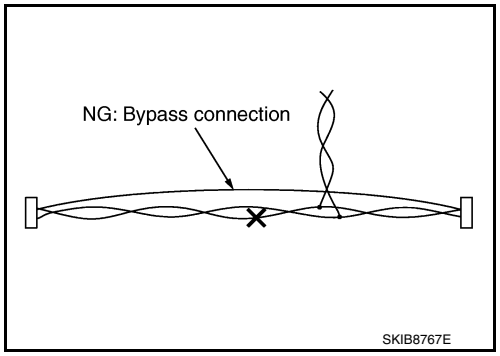
INFOID:0000000009464802

ITS communication uses a twisted pair line. Be careful when repairing it.

- Solder the repaired area and wrap tape around the soldered area.
  NOTE:
  A fray of twisted lines must be within 110 mm (4.33 in).



- Bypass connection is never allowed at the repaired area.
  NOTE:
  Bypass connection may cause ITS communication error. The spliced wire becomes separated and the characteristics of twisted line are lost.



Precaution for BSW System Service

INFOID:0000000009464803

WARNING:
Be cautious of traffic conditions and other vehicles when performing a road test.
CAUTION:
- **Do not use the BSW system when driving with free rollers or on a chassis dynamometer.**
- **Do not perform BSW ACTIVE TESTS while driving.**
- **Do not disassemble or alter the rear view camera.**
- **Do not use the rear view camera when removed from the vehicle.**
- **Do not disable the BSW system without the consent of the customer.**

OBSERVE THE FOLLOWING ITEMS IN ORDER TO KEEP THE BSW SYSTEM OPERATING PROPERLY:

Rear view Camera Maintenance

The rear view camera for the BSW system is located in the truck lid. To keep the BSW system operating properly and prevent a malfunction, be sure to observe the following:
- Always keep the camera lens area clean.
- Do not attach bumper stickers (including transparent materials) or install an accessory near the rear view-camera.
- Do not strike or damage the areas around the rear view camera.
- Do not touch the camera lens (except for cleaning) or remove the rear view camera.

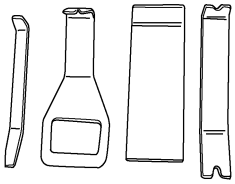
PREPARATION

PREPARATION

Special Service Tool

INFOID:0000000009464804

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

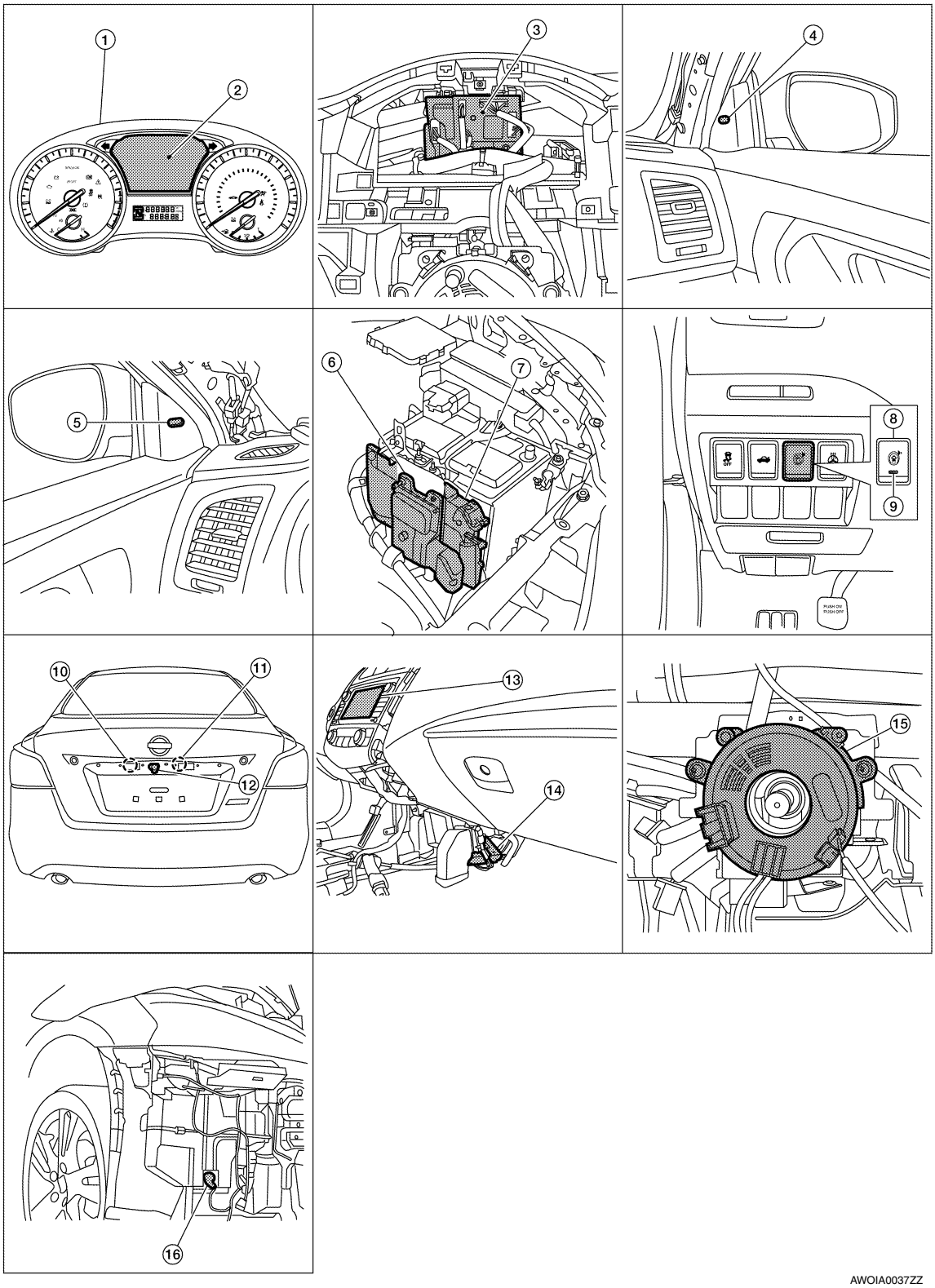
Tool number (TechMate No.) Tool name	Description
— (J-46534) Trim Tool Set  AWJIA0483ZZ	Removing trim components

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000009464805



AWOIA0037ZZ

1. Combination meter
2. Vehicle information display
3. BCM (view with combination meter removed)
4. Blind spot warning indicator RH
5. Blind spot warning indicator LH
6. TCM
7. ECM
8. Warning systems switch
9. Warning systems ON indicator
10. Rear view camera washer control unit
11. Rear view camera air pump motor
12. Rear view camera
13. AV control unit (center display) (with navigation system and bose audio system) Audio unit (center display) (with display audio system and bose audio system)
14. ITS control unit (view with center console removed)
15. Steering angle sensor (view with steering wheel removed)
16. Washer fluid level switch (view with front fascia removed)

Component Description

INFOID:0000000009464806

Component	Description
ITS control unit	• Being connected with rear view camera via ITS communication, receives vehicle detection signal and transmits Blind Spot Warning indicator signal and Blind Spot Warning indicator dimmer signal to the rear view camera • Being connected with lane camera unit via ITS communication, receives detected lane condition signal • Receives steering angle sensor signal from steering angle sensor via CAN communication • Judges a Blind Spot Warning indicator ON/OFF state and an approach state to the lane marker, based on each signal. • Activates the warning buzzer and warning systems ON indicator • Transmits Blind Spot Warning ON indicator signal to combination meter via CAN communication
Blind Spot Warning indicator LH/RH	Receives Blind Spot Warning indicator operation signal from rear view camera and turns OFF, turns ON or blinks
Warning systems switch	Inputs the switch signal to ITS control unit
Warning systems ON indicator (On the warning systems switch)	Indicates BSW system status
Rear view camera	• Detects the lane marker by the built-in camera • Transmits detected lane condition signal to ITS control unit
ABS actuator and electric unit (control unit)	• Transmits vehicle speed signal to ITS control unit via CAN communication • Transmits yaw rate signal/side G sensor signal to ITS control unit via CAN communication
Buzzer (combination meter)	Receives buzzer signal from ITS control unit and sounds buzzer.
Combination meter	• Turns the Blind Spot Warning indicator ON/OFF according to the signals from the ITS control unit via CAN communication • Receives Blind Spot Warning ON indicator signal via CAN communication.
Steering angle sensor	Transmits steering angle sensor signal to ITS control unit via CAN communication
BCM	• Transmits turn signal indicator to ITS control unit via CAN communication • Transmits dimmer signal to ITS control unit via CAN communication
ECM	Transmits engine speed signal to ITS control unit via CAN communication
TCM	Transmits the output shaft speed signal, input speed signal, current gear position signal and shift position signal to ITS control unit via CAN communication
AV control unit (with navigation system and bose audio system)	Receives the various systems and camera signals via CAN communication and routes them to the center display
Audio unit (with display audio system and bose audio system)	Receives the various systems and camera signals and routes them to the center display
Center display	Displays the various system screen signals according to the priority level received via CAN communication

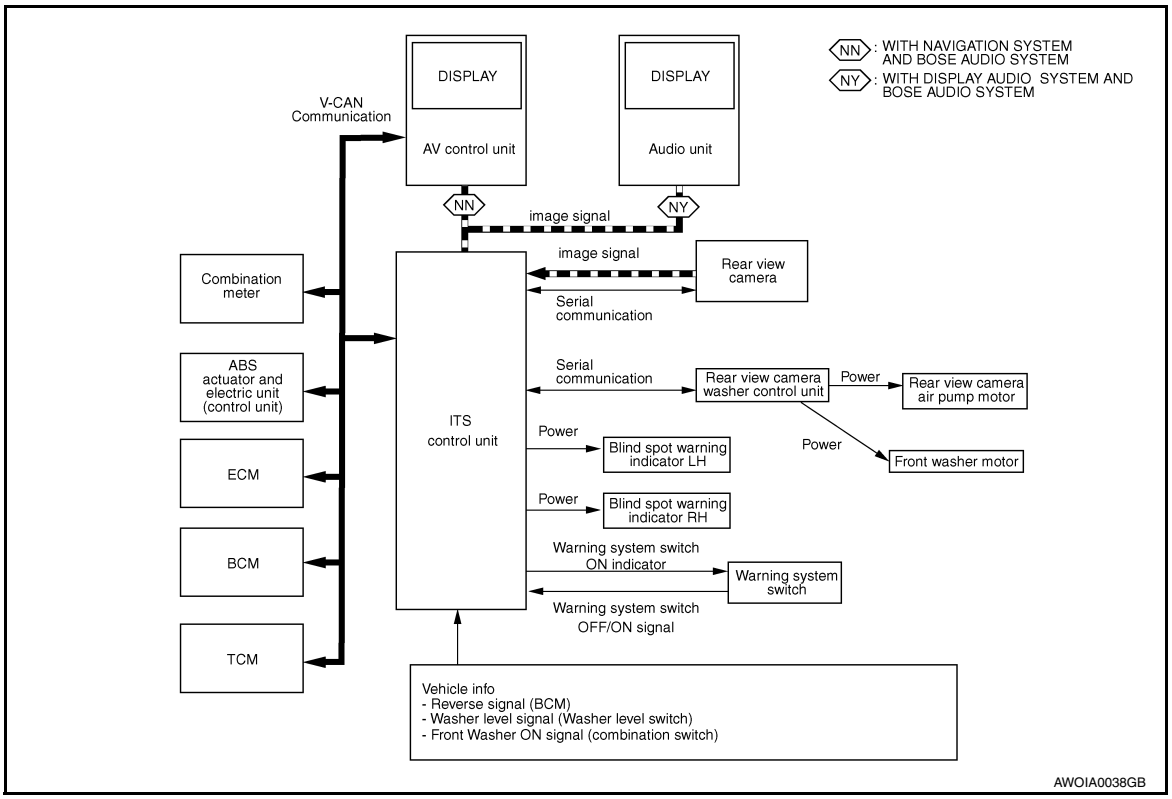
Component	Description
Rear view camera washer control unit	Controls the air pump to drive air to the rear camera lens according to the signals received from the ITS control unit
Rear view camera air pump motor	Drives air to the rear camera lens according to the signals received from the pump control unit

SYSTEM

System Description

INFOID:0000000009464807

SYSTEM DIAGRAM



CONTROL UNIT INPUT/OUTPUT SIGNAL ITEM

Control unit receives signals via CAN communication. It also detects vehicle conditions that are necessary for BSW control.

Input Signal Item

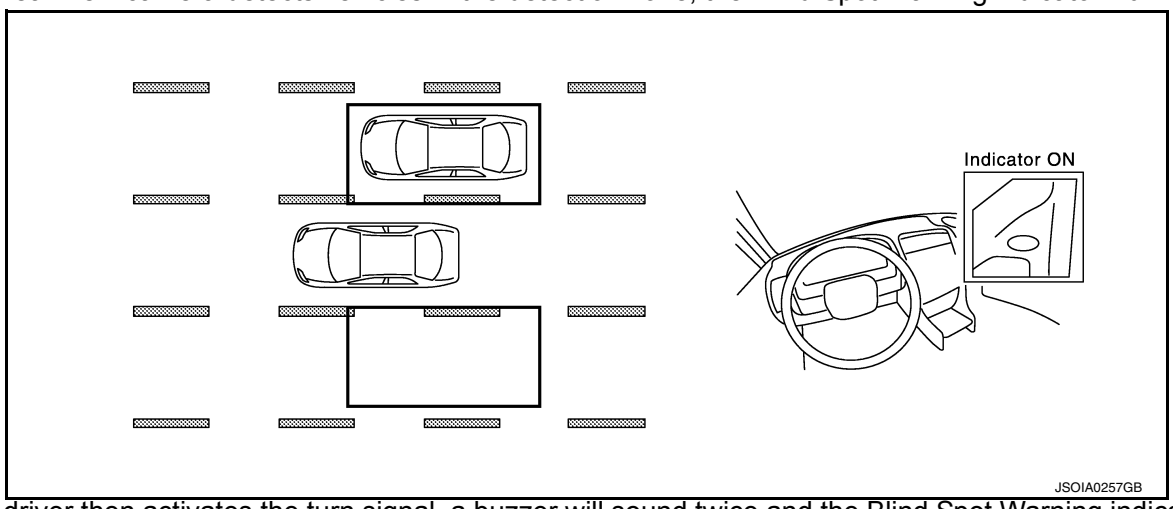
Transmit unit	Signal name		Description
ECM	CAN Communication	Engine status signal	Receive engine status
BCM	CAN communication	Door open status signal	Receive door open status
		Light status signal	Receive light status
ABS actuator and electric unit (control unit)	CAN communication	Wheel speed signal	Receive wheel speed
TCM	CAN communication	Shift selector position signal	Receive shift selector position
Combination meter	CAN communication	Moving Object Detection ON/OFF signal	Receive the ON/OFF status for Moving Object Detection function
Rear view camera	NTSC	Video signal	Receive Rear View Camera image from camera for Moving Object Detection function in ITS controller

Output Signal Item

Reception unit	Signal name		Description
Combination meter	CAN communication	Buzzer request	Transmits a buzzer request signal when the moving object is detected
Display	CAN communication	Visual signal request	Transmits a visual signal request from ITS Controller to display Rear View while the shift selector is in R (reverse)

FUNCTION DESCRIPTION

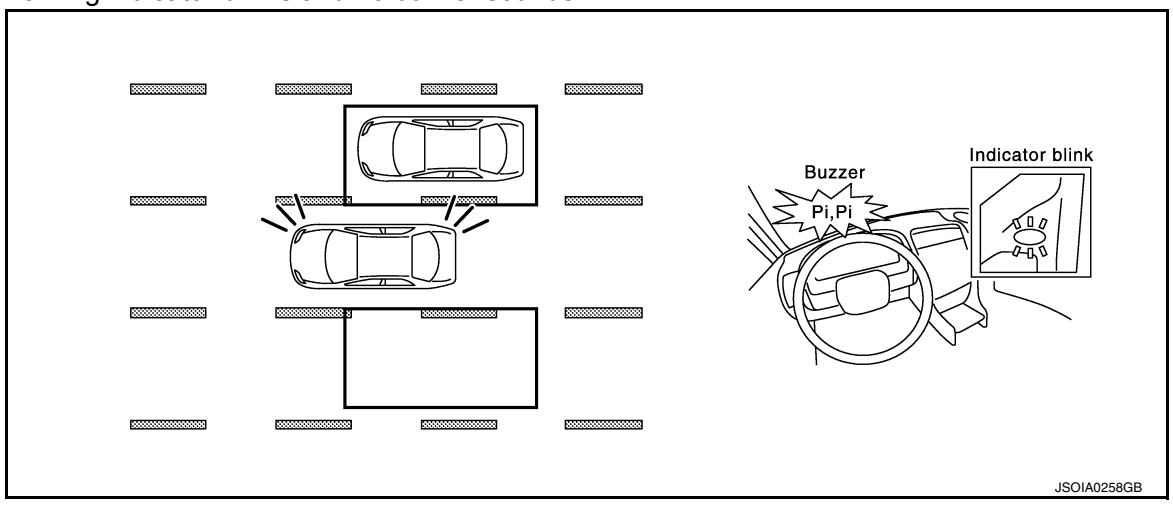
- The BSW system can help alert the driver of other vehicles in adjacent lanes when changing lanes.
- The BSW system uses rear view camera near the rear bumper to detect vehicles in an adjacent lane.
- The rear view camera can detect vehicles on either side of vehicle within the detection zone shown as illustrated.
- This detection zone starts from the back of the vehicle and extends approximately 3.0 m (10 ft) behind the rear bumper, and approximately 13.0 m (10 ft) sideways.
- The BSW system operates above approximately 32 km/h (20 MPH).
- If the rear view camera detects vehicles in the detection zone, the Blind Spot Warning indicator illuminates.



- If the driver then activates the turn signal, a buzzer will sound twice and the Blind Spot Warning indicator will blink.

NOTE:

A buzzer sounds if the rear view camera has already detected vehicles when the driver activates the turn signal. If a vehicle comes into the detection zone after the driver activates the turn signal, then only the Blind Spot Warning indicator blinks and no buzzer sounds.



BSW SYSTEM OPERATION DESCRIPTION

- Control unit enables BSW system.
- The control unit turns on the BSW system when the warning systems switch is turned ON.
- Rear view camera detects a vehicle in the adjacent lane, and transmits the vehicle detection signal to control unit.
- Control unit starts the control as follows, based on a vehicle detection signal, turn signal and dimmer signal transmitted from BCM via CAN communication:

- Blind Spot Warning indicator signal and Blind Spot Warning indicator dimmer signal transmission to rear view camera.
- Buzzer signal transmission to warning buzzer.

- Rear view camera transmits an indicator operation signal to the Blind Spot Warning indicator according to Blind Spot Warning indicator signal and Blind Spot Warning indicator dimmer signal.

Operation Condition of BSW System

control unit performs the control when the following conditions are satisfied:

- When the warning systems switch is turned ON*.
- When the vehicle drives at 32 km/h (20 MPH) or more in the forward direction.

NOTE:

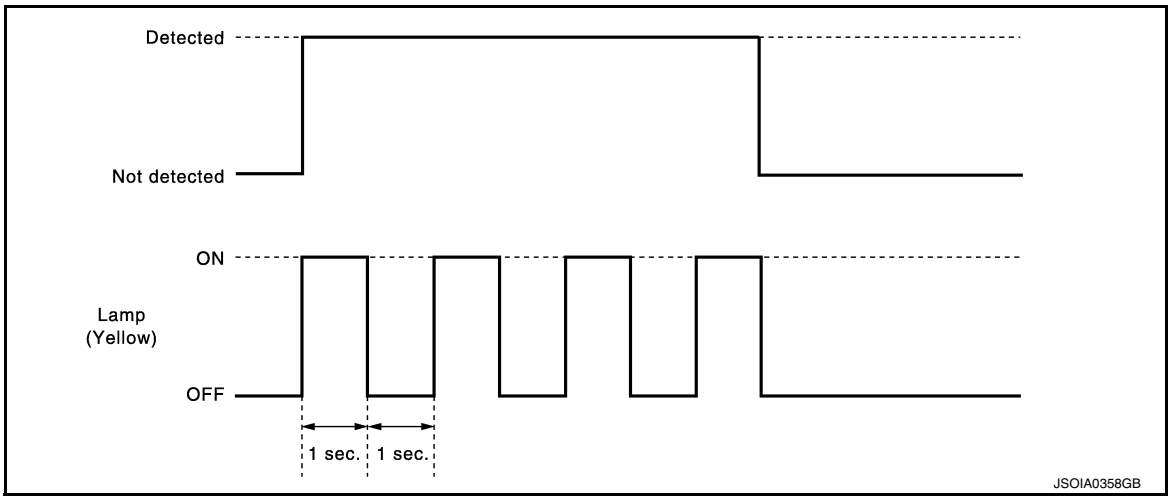
*: When the BSW system setting on the vehicle information display screen is ON.

- After the operating conditions of warning are satisfied, the warning continues until the vehicle speed is reduced below approximately 29 km/h (18 MPH)
- The BSW system may not function properly, depending on the situation.

BULB CHECK ACTION AND FAIL-SAFE INDICATION

Vehicle condition/Driver's operation	Blind Spot Warning/ Blind Spot Intervention indicator	Warning systems ON indicator	Indication on the combination meter
When DTC is detected	OFF	ON	OFF → Orange  ALOIA0172GB
Temporary disabled status	OFF	ON	BSW light (white) will blink
When rear view camera needs cleaning	OFF	ON	Unavailable: Clean Rear Camera
When the warning systems switch is pressed (When the settings of LDW system and BSW system on the vehicle information screen are "OFF")	OFF	Blink	—

*: Blinking cycle when there is a rear view camera blockage condition or lane camera unit high temperature condition



NOTE:

Time shown in the figure is approximate.

Fail-safe (ITS Control Unit)

INFOID:0000000009464808

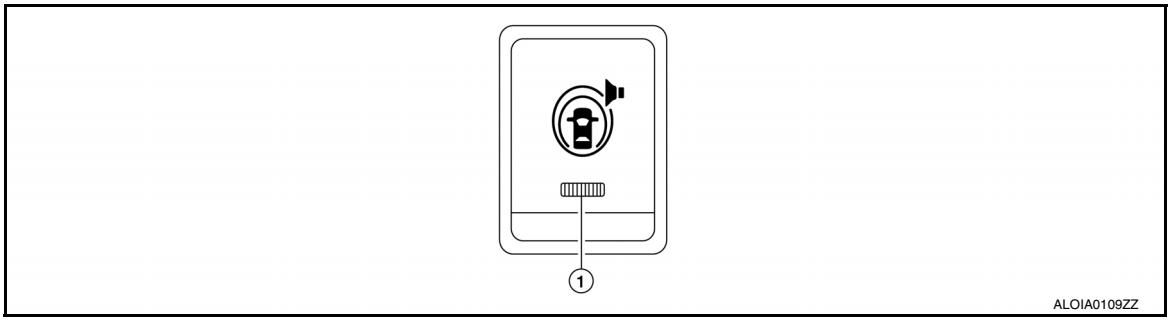
If a malfunction occurs in each system, ITS control unit cancels each control, and turns ON the warning lamp or indicator lamp.

System	Warning lamp/Indicator lamp	Description
Blind Spot Warning (BSW)	Blind Spot Warning lamp	Cancel
Lane Departure Warning (LDW)	Lane Departure Warning indicator	Cancel

OPERATION

Switch Name and Function

INFOID:0000000009464809

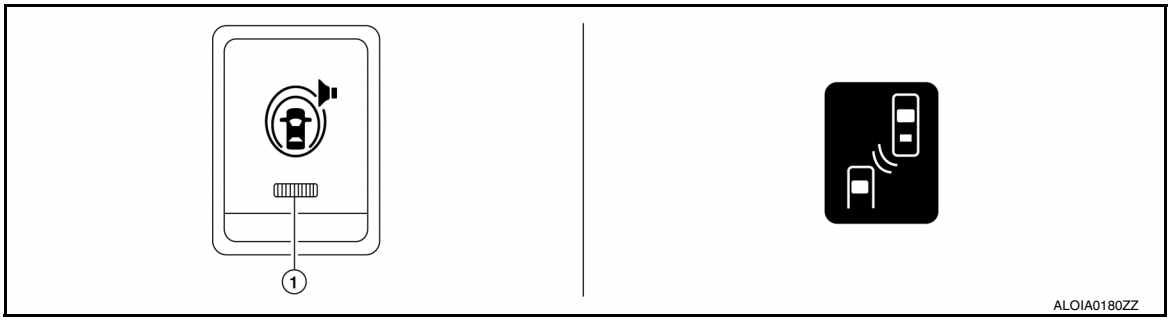


No.	Name	Function
1	Warning systems switch	Turns BSW system ON/OFF (When the setting of BSW system on the vehicle information display setting screen is ON)

System Display and Warning

INFOID:0000000009464810

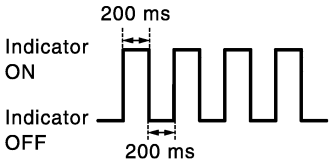
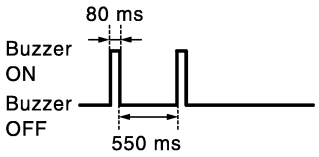
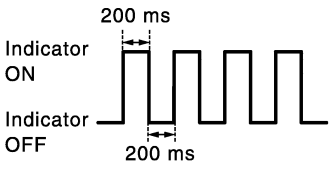
INDICATOR AND WARNING LAMP



No.	Name	Description
1	Warning systems ON indicator	Indicates that the LDW system and/or BSW system is ON
2	Blind Spot Warning lamp (orange)	• Turns ON when Blind Spot Warning system is malfunctioning • Blinks during the following conditions: - DTC is detected or system is temporarily disabled. - When rear view camera blockage is detected.

DISPLAY AND WARNING OPERATION

Vehicle condition/ Driver's operation				Action	
Warning systems ON indicator	Vehicle speed (Approx.) [km/h (MPH)]	Turn signal condition	Status of vehicle detection within detection area	Indication on the Blind Spot Warning indicator	Buzzer
OFF	—	—	—	OFF	OFF

Vehicle condition/ Driver's operation				Action	
Warning systems ON indicator	Vehicle speed (Approx.) [km/h (MPH)]	Turn signal condition	Status of vehicle detection within detection area	Indication on the Blind Spot Warning indicator	Buzzer
ON	Less than approx. 29km/h (18MPH)	—	—	OFF	OFF
	Approx. 32 km/h (20 MPH) or more	—	Vehicle is absent	OFF	OFF
		OFF	Vehicle is detected	ON	OFF
		ON (vehicle detected direction)	Before turn signal operates Vehicle is detected	Blink  JSOIA0251GB	Short continuous beep  JSOIA0252GB
			Vehicle is detected after turn signal operates	Blink  JSOIA0251GB	OFF

NOTE:

- If vehicle speed exceeds approximately 32 km/h (20 MPH), BSW function operates until the vehicle speed becomes lower than approximately 29 km/h (18 MPH).
- Time shown in the figure is approximate.
- Whenever Blind Spot Warning system is turned off, the warning systems ON indicator remains OFF.

HANDLING PRECAUTION

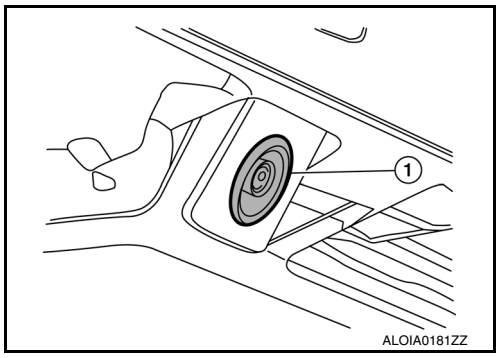
Precautions for Blind Spot Warning

INFOID:0000000009464811

REAR VIEW CAMERA HANDLING

The rear camera unit “1” for the LDW/BSW systems is located above the rear license plate.
To keep the proper operation of the LDW systems and prevent a system malfunction, be sure to observe the following:

- Always keep the camera lens clean. Be careful not to damage the nozzle of the automatic washer and blower.
- Do not attach ”license plate accessories” that reflect light.
- Do not strike or damage the areas around the camera unit.



BLIND SPOT WARNING (BSW)

- BSW system is not a replacement for proper driving procedure and is not designed to prevent contact with vehicles or objects. When changing lanes, always use the side and rear mirrors and turn and look in the direction you will move to ensure it is safe to change lanes. Never rely solely on the BSW system.
- The camera unit may not detect properly under the following conditions:
- When towing a trailer.
- When strong light enters the camera unit. (For example, direct sunlight or headlight from the rear.)
- When ambient light changes instantly. (For example, when the vehicle enters or exits a tunnel or passes under a bridge.)
- Automatic washer and blower may not be able to secure detection capability when excessive dirt adheres on the camera lens.
- Excessive noise (e.g. audio system volume, open vehicle window) will interfere with the chime sound, and it may not be heard.
- The camera unit may not be able to detect when certain objects are present such as:
- Pedestrians, bicycles, animals.
- Several types of vehicles such as motorcycles.
- Oncoming vehicles.
- A vehicle approaching rapidly from behind
- A vehicle which your vehicle overtakes rapidly.
- The camera unit may not be able to detect properly when your vehicle travels beside the middle section of a vehicle with a long wheelbase (e.g., trailer truck, semi-trailer, tractor).
- The camera unit is designed to ignore most stationary objects, however objects such as guardrails, walls, foliage and parked vehicles may occasionally be detected. This is a normal operating condition.
- The camera unit may detect reflection image of vehicles or roadside objects that are not actually in the detection zone, especially when the road is wet.

DIAGNOSIS SYSTEM (ITS CONTROL UNIT)

CONSULT Function (AVM)

INFOID:0000000009951646

CAUTION:
After disconnecting the CONSULT vehicle interface (VI) 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 performs the following functions via CAN communication using ITS control unit.

Diagnosis mode	Description
Self Diagnostic Result	Displays the name of a malfunctioning system stored in the ITS control unit
Data Monitor	Displays ITS control unit input/output data in real time
Work support	Displays causes of automatic system cancellation occurred during system control
Active Test	Enables an operational check of a load by transmitting a driving signal from the ITS control unit to the load
ECU identification	Displays ITS control unit part number
Configuration	The vehicle specification can be written when replacing the ITS control unit

SELF DIAGNOSTIC RESULT

Refer to DAS-164, "DTC Index".

DATA MONITOR

Monitored item [Unit]	Description
ST ANGLE SENSOR SIGNAL [On/Off]	Indicates [On/Off] status as judged from ITS control unit (Angle sensor transmits angle signal through CAN communication)
REVERSE SIGNAL [On/Off]	Indicates [On/Off] status as judged from ITS control unit (TCM transmits reverse signal through CAN communication)
VEHICLE SPEED SIGNAL [On/Off]	Indicates vehicle speed calculated from ITS control unit through CAN communication [ABS actuator and electric unit (control unit) transmits vehicle speed signal (wheel speed) through CAN communication]
CAMERA SWITCH SIGNAL [On/Off]	Indicates [On/Off] status of camera switch signal as judged from ITS control unit
CAMERA OFF SIGNAL [On/Off]	Indicates [On/Off] status of camera OFF signal as judged from ITS control unit
ST ANGLE SENSOR TYPE [Absolute/Not]	Indicates whether steering angle sensor type is absolute or not (ON means "controlling")
STEERING GEAR RATIO TYPE [Type 0/1]	Indicates the type of the steering gear ratio (type 1 or 2)
STEERING POSITION [LHD/RHD]	Indicates the steering position (LHD or RHD)
REAR CAMERA IMAGE SIGNAL [OK/Not]	Indicates the status of the rear camera image as read from ITS control unit through dedicated ITS communication lines
WASH SW [ON/OFF]	Indicates the state of the wash switch indicator output
R-CAMERA COMM STATUS [OK/Not]	Indicates the status of the rear camera communication status as read from ITS control unit through dedicated ITS communication lines
R-CAMERA COMM LINE [OK/Not]	Indicates the condition of the rear camera communication line whether transmitting properly through dedicated ITS communication lines
PUMP COMM STATUS [OK/NG]	Indicates the state of the communication signal from pump control unit

Monitored item [Unit]	Description
ILL [On/Off]	Indicates [On/Off] status of the illumination signal
ITS SW 1 [On/Off]	Indicates the state of the warning system switch as seen by the ITS control unit
ITS SW 1 IND [On/Off]	Indicates the state of the warning system switch indicator output
TURN SIGNAL [Left/N/Right]	Indicates [Left/N/Right] status of the turn signal output
ITS SW 2 [ON/OFF/No setting]	Indicates the state of the warning system secondary switch as seen by the ITS control unit
ITS SW 2 IND [ON/OFF/No setting]	Indicates the state of the warning system secondary switch indicator output

WORK SUPPORT

Work support items	Description
PREDICTIVE COURSE LINE DISPLAY	Setting whether predictive guide line displays or not
INITIALIZE CAMERA IMAGE CALIBRATION	Start the initialization process of the rear camera
STEERING ANGLE SENSOR ADJUSTMENT	Execute register neutral point of steering angle sensor
CALIBRATING CAMERA IMAGE (REAR CAMERA)	Displays the various values of the rear camera during the calibration process
REAR WIDE-VIEW FIXED GUIDE LINE CORRECTION	Adjustment the position of fixed guide line on rear wide view
REAR CAMERA ITS	Displays and sets camera image calibration values
CAUSE OF LDW CANCEL	Displays the information about reason of LDW cancellation
CAUSE OF BSW CANCEL	Displays the information about reason of BSW cancellation

ACTIVE TEST

CAUTION:

- **Never perform “Active Test” while driving the vehicle.**
- **The “Active Test” cannot be performed when the following systems warning indicators are illuminated:**
  - **Lane Departure Warning indicator**
  - **Blind Spot Warning indicator**
- **Place the shift selector to P (park) position, and then perform the test.**

Test item		Description
WASH ACTIVE	ON	Activates the washer to clean the lens of rear camera
	OFF	
LED LH INDICATOR	ON	Flashes the left side LED light for ITS system
	OFF	
LED RH INDICATOR	ON	Flashes the right side LED light for ITS system
	OFF	
AIR ACTIVE	ON	Activates the air pump to clean the lens of rear camera
	OFF	
AIR & WASH ACTIVE	ON	Activates the air pump and washer to clean the lens of rear camera
	OFF	

BSW ON INDICATOR

Test item	Operation	Description	Blind Spot Warning ON indicator lamp (Yellow)
BSW ON INDICATOR	Off	Stops transmitting the Blind Spot Warning ON indicator signal below to end the test	Off
	On	Transmits the Blind Spot Warning ON indicator signal to the warning lamp on the door	ON
Washer	Off	Stops transmitting activate signal to washer below to end the test	Off
	On	Transmits activate signal to washer	ON
Air pump	Off	Stops transmitting activate signal to air pump below to end the test	Off
	On	Transmits activate signal to air pump	ON

ECU IDENTIFICATION

ITS control unit part number is displayed.

CONFIGURATION

The specifications of the vehicle can be written and read in the ITS control unit when replaced.

ECU DIAGNOSIS INFORMATION

ITS CONTROL UNIT

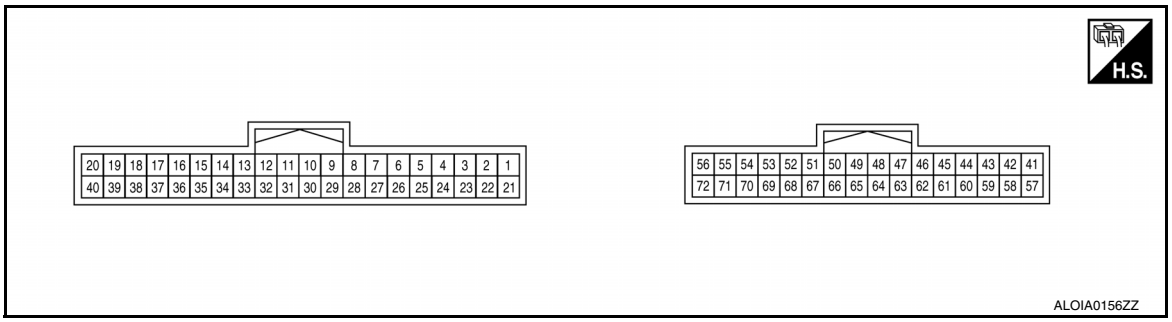
Reference Value

INFOID:0000000009951648

VALUES ON THE DIAGNOSIS TOOL

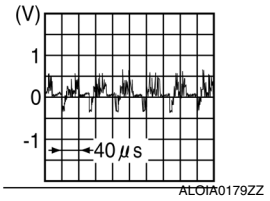
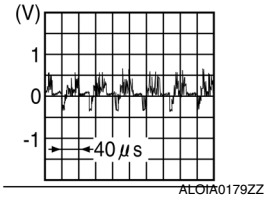
Monitor item	Condition		Value/Status
ST ANGLE SENSOR SIGNAL	Ignition switch ON	Steering angle signal is received	On
		Steering angle signal is not received	Off
REVERSE SIGNAL	Ignition switch ON	Shift selector in R (reverse)	On
		Shift selector is not in R (reverse)	Off
VEHICLE SPEED SIGNAL	While driving	Vehicle speed signal is received	On
		Vehicle speed signal is not received	Off
CAMERA SWITCH SIGNAL	Ignition switch ON	Camera switch is pressed	On
		Camera switch is not pressed	Off
CAMERA OFF SIGNAL	Ignition switch ON	Purpose switch is pressed	On
		Purpose switch is not pressed	Off
ST ANGLE SENSOR TYPE	Ignition switch ON	Steering angle sensor type is displayed	Absolute
		Steering angle sensor type is not received	Not
STEERING GEAR RATIO TYPE	Ignition switch ON	Pattern 1 type of steering gear ratio displayed	Pattern 1
		Pattern 2 type of steering gear ratio displayed	Pattern 2
STEERING POSITION	Ignition switch ON	It recognizes steering position is left	LHD
		It recognizes steering position is right	RHD
R-CAMERA COMM STATUS	Ignition switch ON	Rear camera serial status is OK	OK
		Rear camera serial status is not OK	NG
R-CAMERA COMM LINE	Ignition switch ON	Rear camera serial communication signal is received	OK
		Rear camera serial communication signal is not received	NG
ILL	Ignition switch ON	Illumination is ON	On
		Illumination is OFF	Off
ITS SW 1	Ignition switch ON	ITS switch is pressed	On
		ITS switch is not pressed	Off
ITS SW 1 IND	Ignition switch ON	Indicator of ITS switch 1 is lighting	On
		Indicator of ITS switch 1 is not lighting	Off
TURN SIGNAL	Ignition switch ON	Turn signal left is received	Left
		Turn signal neutral is received	N
		Turn signal right is received	Right
REAR CAMERA IMAGE SIGNAL	Ignition switch ON	Camera image signal is received	On
		Camera image signal is not received	Off
ITS SW 2	Ignition switch ON	For this vehicle, the displaying is fixed	No setting
ITS SW 2 IND	Ignition switch ON	For this vehicle, the displaying is fixed	No setting
WASH SW	Ignition switch ON	Wash switch signal is pressed	On
		Wash switch signal is not pressed	Off
PUMP COMM STATUS	Ignition switch ON	Pump communication signal is received	On
		Pump communication signal is not received	Off

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
1 (BR)	Ground	Washer level switch	Input	Ignition switch ON	When washer fluid is low (switch closed)	0 V
					When washer fluid is not low (switch open)	12 V
2 (G)	Ground	Washer signal pump to camera	Input	Ignition switch ON		5 V
3 (W)	Ground	Washer signal camera to pump	Output	Ignition switch ON		5 V
7 (P)	Ground	CAN -L	—	—	—	—
17 (G)	Ground	SOW LED signal R	Output	While driving	LDW/BSW detected	12 V
					LDW/BSW is not detected	0 V
20 (G)	Ground	Battery supply	Input	—	—	12 V
22 (P)	Ground	Serial ground	Output	—	—	0 V
27 (L)	Ground	CAN -H	—	—	—	—
28 (R)	Ground	Reverse	Input	Ignition switch ON	Shift selector in R (reverse)	12 V
					Shift selector not in R (reverse)	0 V
32 (P)	Ground	Cancel SW output	Input	Ignition switch ON	Cancel switch pressed	0 V
					Cancel switch not pressed	12 V
33 (BG)	Ground	LED input	Output	Ignition switch ON	Warning system is ON	12 V
					Warning system is OFF	0 V
37 (W)	Ground	SOW LED signal L	Output	While driving	LDW/BSW detected	12 V
					LDW/BSW is not detected	0 V
39 (BG)	Ground	Ignition power supply	Input	Ignition switch ON		Battery Voltage
40 (B)	Ground	Ground	—	—	—	0 V
50, 53	Ground	Shield	—	—	—	0 V
51 (R)	Ground	RR CAM GND	Output	Ignition switch ON	—	0 V

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	–	Signal name	Input/ Output		
52 (W)	Ground	RR CAM ON	Output	Ignition switch ON	6 V
66 (B)	Ground	RR CAM COMP +	Input	Ignition switch ON	 ALOIA0179ZZ
68 (G)	Ground	RR CAM CONT	Input	Ignition switch ON	5 V
69 (B)	Ground	RR CAM COMP +	Input	Ignition switch ON	 ALOIA0179ZZ

Fail-safe

INFOID:0000000009951649

If a malfunction occurs in each system, ITS control unit cancels each control, sounds a beep, and turns ON the warning lamp or indicator lamp.

System	Buzzer	Warning Indicator lamp	Description
Lane Departure Warning (LDW)	Low-pitched tone	Lane Departure Warning lamp	Cancel
Blind Spot Warning (BSW)	High-pitched tone	Blind Spot Warning lamp	Cancel
Moving Object Detection (MOD)	Low-pitched tone	Warning lamp MOD icon (on camera screen)	Cancel

DTC Inspection Priority Chart

INFOID:0000000009951650

If multiple DTCs are detected simultaneously, check them one by one depending on the following DTC inspection priority chart.

Priority	Detected items (DTC)
1	• U1000: CAN COMM CIRCUIT • U1010: CONTROL UNIT (CAN)
2	• U1305: CAMERA IMAGE CALIB • U1308: CAMERA CONFIG
3	• C1A39: STRG SEN CIR • U0428: STRG SEN CAN CIR 2 • U111A: REAR CAMERA IMAGE SIGNAL • U1232: ST ANGLE SEN CALIB • U1309: PUMP UNIT CURRENT • U130B: REAR CAMERA COMM ERROR • U1310: PUMP UNIT CIRCUIT
4	• C1A03: VHCL SPEED SE CIRC • C1A04: VDC FAIL • U0122: VDC P-RUN DIAG • U0416: VDC CHECKSUM DIAG

DTC Index

INFOID:0000000009951651

NOTE:
- The details of time display are as follows:
- CRNT: A malfunction is detected now
- PAST: A malfunction was detected in the past
- IGN counter is displayed on FFD (Freeze Frame Data).
- 0: The malfunctions that are detected now
  CAN communication system (U1000, U1010)
- 1 - 39: It increases like 0 → 1 → 2 ··· 38 → 39 after returning to the normal condition whenever the ignition switch OFF → ON. It returns to 0 when a malfunction is detected again in the process.
- If it is over 39, it is fixed to 39 until the self-diagnosis results are erased.
  Other than CAN communication system (Other than U1000, U1010)
- 1 - 49: It increases like 0 → 1 → 2 ··· 38 → 49 after returning to the normal condition whenever the ignition switch OFF → ON. It returns to 0 when a malfunction is detected again in the process.
- If it is over 49, it is fixed to 49 until the self-diagnosis results are erased.

Systems for fail-safe
- A: Lane Departure Warning (LDW)
- B: Blind Spot Warning (BSW)
- C: Moving Object Detection (MOD)

DTC		Warning lamp			Fail-safe	
CONSULT	CONSULT display	Lane Departure Warning	Blind Spot Warning	Moving Object Detection	System	Reference
C1A03	VHCL SPEED SE CIRC	ON	ON	ON	A, B, C	DAS-186
C1A04	VDC FAIL	ON	ON	ON	A, B, C	DAS-187
C1A39	STRG SEN CIR	ON	ON	ON	A, B, C	DAS-188
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED	NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED	—	—	—	—	—
U0122	VDC P-RUN DIAG	ON	ON	ON	A, B, C	DAS-189
U0416	VDC CHECKSUM DIAG	ON	ON	ON	A, B, C	DAS-190
U0428	STRG SEN CAN CIR 2	ON	ON	ON	A, B, C	DAS-191
U1000[NOTE]	CAN COMM CIRCUIT	ON	ON	ON	A, B, C	DAS-192
U1010	CONTROL UNIT (CAN)	ON	ON	ON	A, B, C	DAS-193
U111A	REAR CAMERA IMAGE SIGNAL	ON	ON	ON	A, B, C	DAS-194
U1232	ST ANGLE SEN CALIB	ON	ON	ON	A, B, C	DAS-196
U1305	CAMERA IMAGE CALIB	ON	ON	ON	A, B, C	DAS-197
U1308	CAMERA CONFIG	ON	ON	ON	A, B, C	DAS-198
U1309	PUMP UNIT CURRENT	ON	ON	ON	A, B, C	DAS-199
U130B	REAR CAMERA COMM ERROR	ON	ON	ON	A, B, C	DAS-202
U1310	PUMP UNIT CIRCUIT	ON	ON	ON	A, B, C	DAS-203

NOTE:
With the detection of “U1000” some systems do not perform the fail-safe operation.

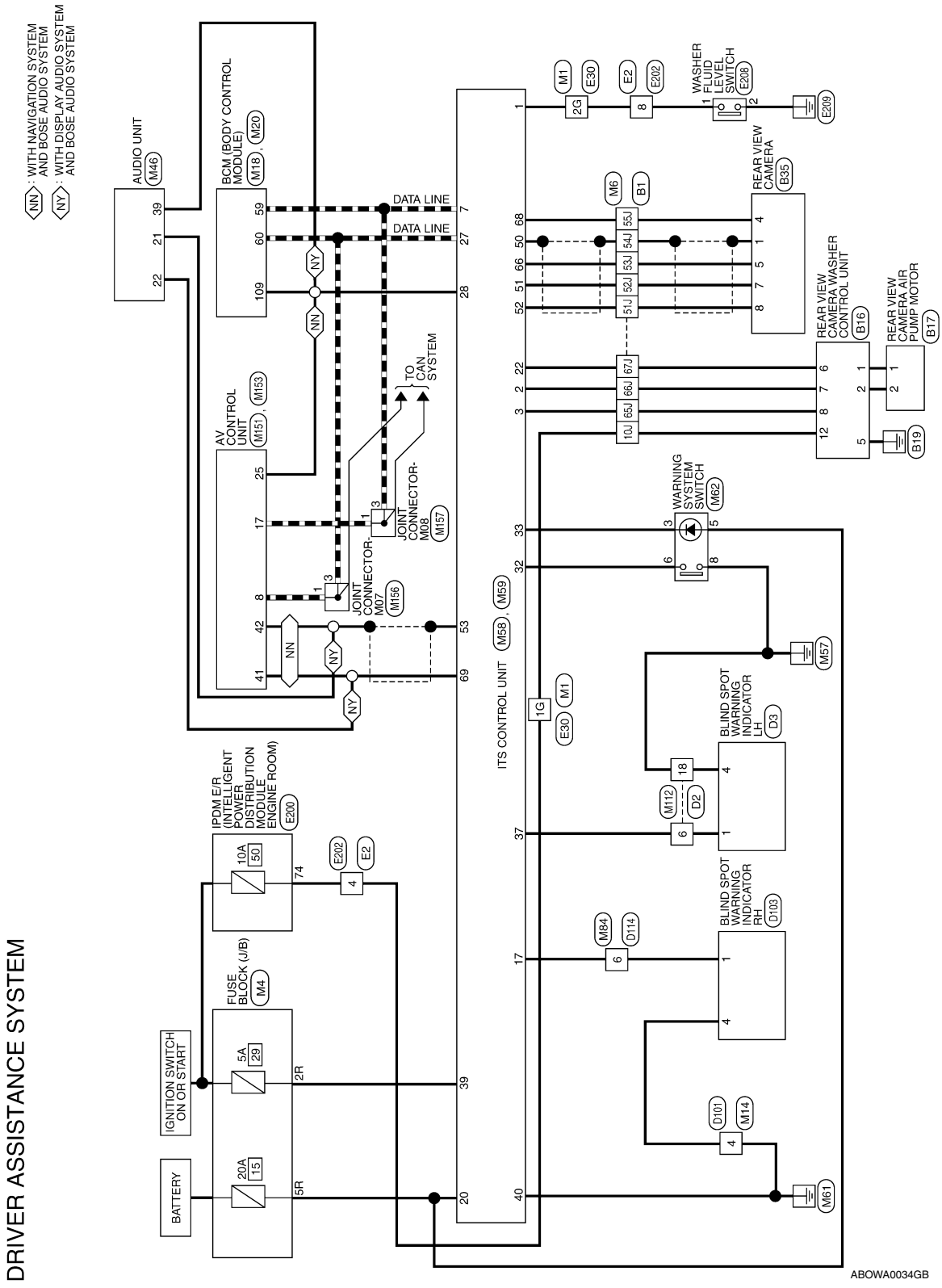
A system controlling based on a signal received from the control unit performs fail-safe operation when the communication with the ITS control unit becomes inoperable.

WIRING DIAGRAM

DRIVER ASSISTANCE SYSTEMS

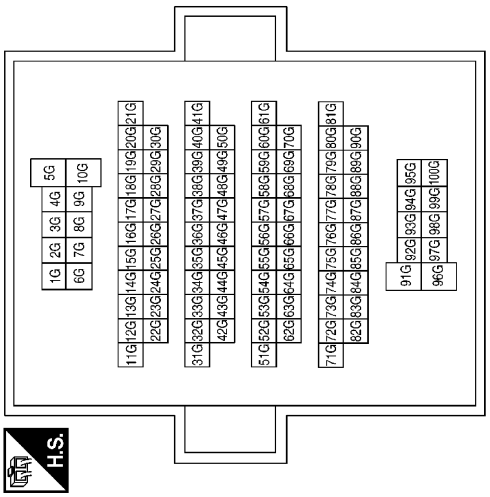
Wiring Diagram

INFOID:0000000009464817



DRIVER ASSISTANCE SYSTEM CONNECTORS

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

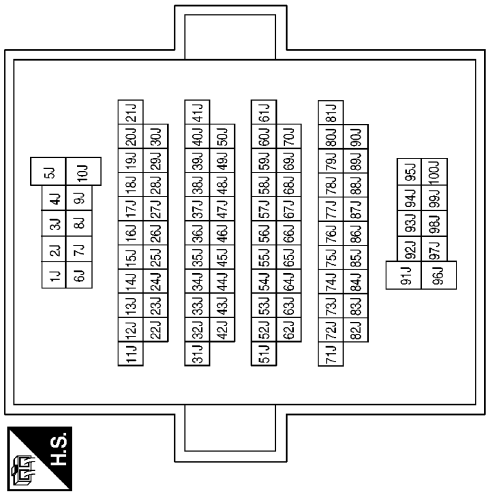


Terminal No.	Color of Wire	Signal Name
1G	LG	–
2G	BR	–

Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Color	BROWN

Terminal No.	Color of Wire	Signal Name
2R	BG	–
5R	G	–

Connector No.	M6
Connector Name	WIRE TO WIRE
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
10J	LG	–
51J	W	–
52J	R	–
53J	B	–
54J	SHIELD	–
55J	G	–
65J	W	–
66J	G	–
67J	P	–

ABOIA0115GB

Connector No.	M14
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1	2		3
4	5	6	7	8

Terminal No.	Color of Wire	Signal Name
4	GR	–

Connector No.	M18
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	BLACK

H.S.

60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41
80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64	63	62	61

Terminal No.	Color of Wire	Signal Name
59	P	CAN-L
60	L	CAN-H

Connector No.	M20
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	BLACK

H.S.

116	115	114	113	112	111	110	109	108	107	106	105
128	127	126	125	124	123	122	121	120	119	118	117

Terminal No.	Color of Wire	Signal Name
109	G	REVERSE SIGNAL

Connector No.	M46
Connector Name	AUDIO UNIT (WITH DISPLAY AUDIO SYSTEM AND BOSE AUDIO SYSTEM)
Connector Color	WHITE

H.S.

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52

Terminal No.	Color of Wire	Signal Name
21	SHIELD	COMPOSITE -
22	B	COMPOSITE +
39	G	REVERSE

ABOIA0116GB

Connector No.	M58
Connector Name	ITS CONTROL UNIT
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
1	BR	WASH LVL SW
2	G	FROM PUMP TO CAMERA C/U
3	W	FROM CAMERA C/U TO PUMP
4	–	–
5	–	–
6	–	–

Terminal No.	Color of Wire	Signal Name
7	P	CAN-L
8	–	–
9	–	–
10	–	–
11	–	–
12	–	–
13	–	–
14	–	–
15	–	–
16	–	–
17	G	SOW LED SIGNAL R
18	–	–
19	–	–
20	G	B+
21	–	–
22	P	SERIAL GND
23	–	–

Terminal No.	Color of Wire	Signal Name
24	–	–
25	–	–
26	–	–
27	L	CAN-H
28	R	REV
29	–	–
30	–	–
31	–	–
32	P	CANCEL SW OUTPUT
33	BG	LED INPUT
34	–	–
35	–	–
36	–	–
37	W	SOW LED SIGNAL L
38	–	–
39	BG	IGN
40	B	GND

Connector No.	M59
Connector Name	ITS CONTROL UNIT
Connector Color	WHITE

H.S.

56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41
72	71	70	69	68	67	66	65	64	63	62	61	60	59	58	57

Terminal No.	Color of Wire	Signal Name
41	–	–
42	–	–
43	–	–
44	–	–
45	–	–

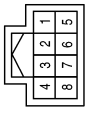
Terminal No.	Color of Wire	Signal Name
46	–	–
47	–	–
48	–	–
49	–	–
50	SHIELD	–
51	R	RR CAM GND
52	W	RR CAM ON
53	SHIELD	–
54	–	–
55	–	–
56	–	–
57	–	–
58	–	–

Terminal No.	Color of Wire	Signal Name
59	–	–
60	–	–
61	–	–
62	–	–
63	–	–
64	–	–
65	–	–
66	B	RR CAM COMP +
67	–	–
68	G	RR CAM CONT
69	B	COMP OUT +
70	–	–
71	–	–
72	–	–

AAOIA0042GB

Connector No.	M62
Connector Name	WARNING SYSTEM SWITCH
Connector Color	GRAY

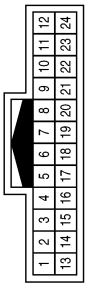
H.S.



Terminal No.	Color of Wire	Signal Name
3	BG	–
5	G	–
6	P	–
8	B	–

Connector No.	M84
Connector Name	WIRE TO WIRE
Connector Color	WHITE

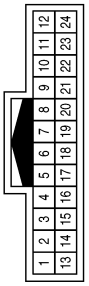
H.S.



Terminal No.	Color of Wire	Signal Name
6	G	–

Connector No.	M112
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
6	W	–
18	B	–

Connector No.	M151
Connector Name	AV CONTROL UNIT (WITH NAVIGATION SYSTEM WITH BOSE AUDIO SYSTEM)
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
8	L	CAN-H
17	P	CAN-L

Connector No.	M153
Connector Name	AV CONTROL UNIT (WITH NAVIGATION SYSTEM WITH BOSE AUDIO SYSTEM)
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
25	G	REVERSE
41	B	CAMERA +
42	SHIELD	CAMERA - (SHIELD)

Connector No.	M156
Connector Name	JOINT CONNECTOR-M07
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	L	–
3	L	–

ABOIA0117GB

Connector No.	M157
Connector Name	JOINT CONNECTOR-M08
Connector Color	WHITE

H.S.

4	3	2	1	0

Terminal No.	Color of Wire	Signal Name
1	P	–
3	P	–

Connector No.	E2
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1	2	3
4	5	6	7	8

Terminal No.	Color of Wire	Signal Name
4	BG	– (WITH REAR VIEW CAMERA)
8	R	–

Connector No.	E30
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1G	BG	– (WITH REAR VIEW CAMERA)
2G	R	–

Connector No.	E200
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE

H.S.

74	75	76
77	78	79	80	81

Terminal No.	Color of Wire	Signal Name
74	BG	WASH MTR (WITH REAR VIEW CAMERA)

ABOIA0118GB

Connector No.	E202
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
4	BG	– (WITH REAR VIEW CAMERA)
8	R	–

Connector No.	E208
Connector Name	WASHER FLUID LEVEL SWITCH
Connector Color	BLACK

H.S.

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

Connector No.	B1
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
10J	W	–
51J	W	–
52J	B	–
53J	R	–
54J	SHIELD	–
55J	G	–
65J	W	–
66J	G	–
67J	P	–

Connector No.	B16
Connector Name	REAR VIEW CAMERA WASHER CONTROL UNIT
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	V	PUMP MOTOR +
2	BR	PUMP MOTOR -
5	B	GND
6	P	SERIAL GND
7	G	FROM PUMP TO CAMERA C/U
8	W	FROM CAMERA C/U TO PUMP
12	W	IGN

ABOIA0119GB

Connector No.	B17
Connector Name	REAR VIEW CAMERA AIR PUMP MOTOR
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	V	–
2	BR	–

Connector No.	B35
Connector Name	REAR VIEW CAMERA
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	SHIELD	–
4	G	–
5	R	–
7	B	–
8	W	–

Connector No.	D2
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
6	P	–
18	B	–

Connector No.	D3
Connector Name	BLIND SPOT WARNING INDICATOR LH
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	P	–
4	B	–

Connector No.	D101
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
4	B	–

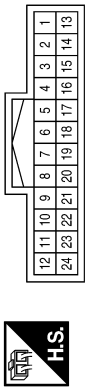
Connector No.	D103
Connector Name	BLIND SPOT WARNING INDICATOR RH
Connector Color	WHITE

H.S.

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

ABOIA0120GB

Connector No.	D114
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
6	R	–

ABOIA0121GB

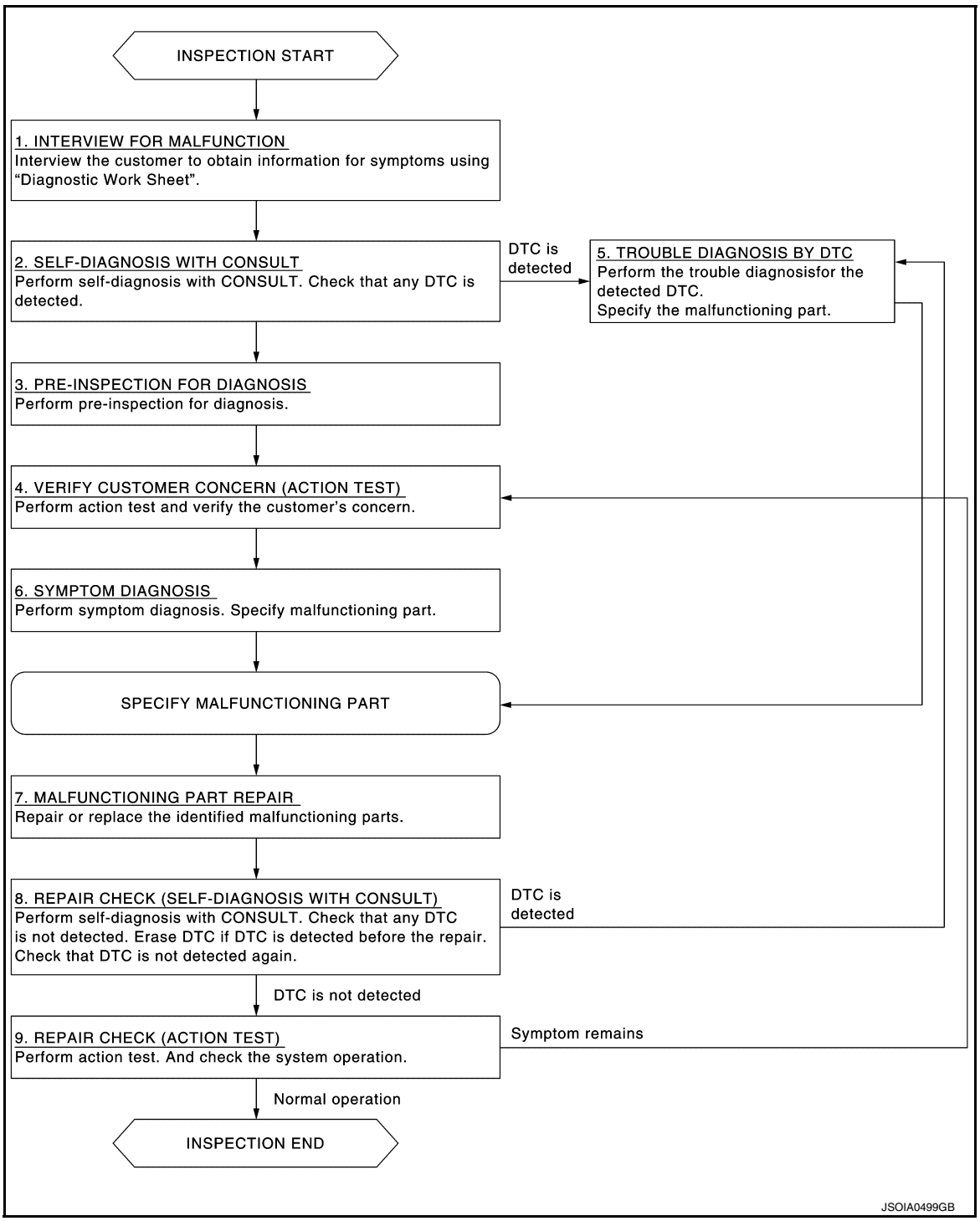
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000009464818

OVERALL SEQUENCE



DETAILED FLOW

1.INTERVIEW FOR MALFUNCTION

Interview the customer to obtain information about symptoms using “Diagnostic Work Sheet”. (Refer to DAS-176, "Diagnostic Work Sheet".)

>> GO TO 2.

2.SELF-DIAGNOSIS WITH CONSULT

1. Perform “All DTC Reading” with CONSULT.
2. Check if the DTC is detected on the self-diagnosis results of “AVM”.

Is any DTC detected?

YES >> GO TO 5.
NO >> GO TO 3.

3.PRE-INSPECTION FOR DIAGNOSIS

Perform pre-inspection for diagnosis. Refer to DAS-178, "Inspection Procedure".

>> GO TO 4.

4.ACTION TEST

Perform BSW system action test to check the operation status. Refer to DAS-179, "Description".

>> GO TO 6.

5.TROUBLE DIAGNOSIS BY DTC

Perform trouble diagnosis for the detected DTC. Specify a malfunctioning part. Refer to DAS-164, "DTC Index" (ITS CONTROL UNIT).

>> GO TO 7.

6.SYMPTOM DIAGNOSIS

Perform symptom diagnosis. Specify malfunctioning part. Refer to DAS-212, "Symptom Table".

>> GO TO 7.

7.MALFUNCTION PART REPAIR

Repair or replace the identified malfunctioning parts.

>> GO TO 8.

8.REPAIR CHECK (SELF-DIAGNOSIS WITH CONSULT)

Perform self-diagnosis with CONSULT. Check that any DTC is not detected. Erase DTC if DTC is detected before the repair. Check that DTC is not detected again.

Is any DTC detected?

YES >> GO TO 5.
NO >> GO TO 9.

9.REPAIR CHECK (ACTION TEST)

Perform BSW system action test. Also check the system operation.

Does it operate normally?

YES >> Inspection End.
NO >> GO TO 4.

Diagnostic Work Sheet

INFOID:0000000009464819

DESCRIPTION

In general, each customer feels differently about an incident. It is important to fully understand the symptoms or conditions for a customer complaint.
There are many operating conditions that lead to the malfunction. A good grasp of such conditions can make troubleshooting faster and more accurate.
Some conditions may cause the lane departure warning lamp to stay ON.

Utilize a work sheet sample to organize all of the information for troubleshooting.

KEY POINTS
- WHAT..... System and functions
- WHEN..... Date, Frequencies
- WHERE..... Road conditions
- HOW..... Operating conditions, Symptoms

WORK SHEET SAMPLE

Customer name MR/MS	Model and Year	VIN
Engine #	Trans.	Mileage
Incident Date	Manuf. Date	In Service Date

Symptoms			
Indicator/Warning lamps	☐ Lane departure warning lamp	☐ Stays ON ☐ Turned ON occasionally	☐ Stays OFF ☐ Others ( ) ☐ Blinks
	☐ Warning systems ON indicator	☐ Stays ON	☐ Stays OFF ☐ Others ( ) ☐ Blinks
	☐ Other lamps ( )	☐ Stays ON ☐ Turned ON occasionally	☐ Stays OFF ☐ Others ( ) ☐ Blinks
Functions	☐ When using BSW		
	☐ All functions do not operate. ☐ Warning function does not operate. (☐ No sound ☐ No indicator) ☐ Yawing function does not operate. (Warning function is operated.) ☐ Functions when changing the course in the turn signal direction. ☐ Functions are untimely. ☐ Does not function when driving on lane markers. ☐ Functions when driving in a lane. ☐ Functions in a different position from the actual position. ☐ Others ( )		

Conditions			
Frequency	☐ Continuously	☐ Intermittently	
Light conditions	☐ Not affected ☐ In the daytime ☐ Direct light	☐ At night ☐ Backlight	☐ Sunrise/sunset (Strong light) ☐ Others ( )
Driving conditions	☐ Not affected ☐ Vehicle speed	MPH (km/h)	☐ Vehicle is stopped
Weather conditions	☐ Not affected ☐ Fine ☐ Clouding	☐ Raining	☐ Snowing ☐ Others ( )
Road conditions	☐ Not affected ☐ Highway ☐ Uneven roads	☐ In town ☐ Winding roads	☐ Others ( )
Lane maker conditions	☐ Not affected ☐ Clear	☐ Unclear	☐ Others ( )
Other conditions			

ALOIA0193GB

PRE-INSPECTION FOR DIAGNOSIS

Inspection Procedure

INFOID:0000000009464820

1.CHECK CAMERA LENS

Is camera lens contaminated with foreign materials?

YES >> Clean camera lens.
NO >> GO TO 2.

2.CHECK REAR VIEW CAMERA UNIT INSTALLATION CONDITION

Check rear view camera unit installation condition (installation position, properly fitted).

Is it properly installed?

YES >> GO TO 3.
NO >> Install rear view camera unit properly, and perform rear view camera calibration. Refer to DAS-182, "Description".

3.CHECK VEHICLE HEIGHT

Check vehicle height. Refer to FSU-26, "Wheelarch Height (Unladen*1)".

Is vehicle height appropriate?

YES >> Inspection End.
NO >> Repair vehicle to appropriate height.

ACTION TEST

Description

INFOID:0000000009464821

- Perform action test to verify the customer's concern.
- Perform action test and check the system operation after system diagnosis.

WARNING:
Be careful of traffic conditions and safety around the vehicle when performing road test.
CAUTION:
• Fully understand the following items well before the road test;
- Precautions: Refer to DAS-73, "Precaution for LDW System Service".
- System description for LDW: Refer to DAS-77, "System Description".
- System description for BSW: Refer to DAS-152, "System Description".
- System description for MOD: Refer to DAS-228, "System Description".
- Handling precaution: Refer to DAS-82, "Precautions for Lane Departure Warning".

Inspection Procedure

INFOID:0000000009464822

WARNING:
Be careful of traffic conditions and safety around the vehicle when performing road test.
CAUTION:
• Fully understand the following items well before the road test;
- Precautions: Refer to DAS-73, "Precaution for LDW System Service".
- System description for LDW: Refer to DAS-77, "System Description".
- System description for BSW: Refer to DAS-152, "System Description".
- System description for MOD: Refer to DAS-228, "System Description".
- Handling precaution: Refer to DAS-82, "Precautions for Lane Departure Warning".

1.CHECK BSW SYSTEM SETTING

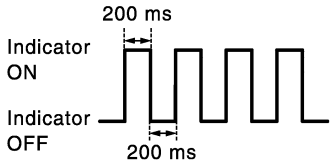
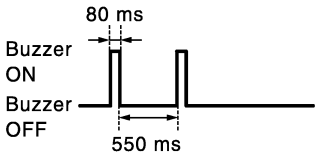
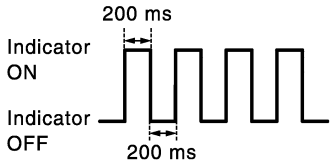
1. Start the engine.
2. Check that the BSW system setting can be enabled/disabled on the vehicle information display.
3. Turn OFF the ignition switch and wait for 30 seconds or more.
4. Check that the previous setting is saved when the engine starts again.

>> GO TO 2.

2.ACTION TEST FOR BSW

1. Enable the setting of the BSW system on the vehicle information display.
2. Turn warning systems switch ON (warning systems ON indicator is ON).
3. Check the BSW operation according to the following table.

Vehicle condition/Driver's operation

Warning systems ON indicator	Vehicle speed (Approx.) [km/h (MPH)]	Turn signal condition	Status of vehicle detection within detection area	Indication on the combination meter	Buzzer
ON	Less than Approx. 29 km/h (18 MPH)	—	—	OFF	OFF
	Approx. 32 km/h (20 MPH) or more	—	Vehicle is absent	OFF	OFF
		OFF	Vehicle is detected	ON	OFF
		ON (vehicle detected direction)	Before turn signal operates vehicle is detected	Blink  JSOIA0251GB	Short continuous beeps  JSOIA0252GB
			Vehicle is detected after turn signal operates	Blink  JSOIA0251GB	OFF

NOTE:
After the operating conditions of warning are satisfied, the warning continues until the vehicle speed reaches approximately 60 km/h (40 MPH). Refer to DAS-152, "System Description".

>> Inspection End.

ADDITIONAL SERVICE WHEN REPLACING REAR VIEW CAMERA

Description

INFOID:0000000009464823

Always perform the calibration after removing and installing or replacing the rear view camera.

CAUTION:

The system does not operate normally unless the rear view camera aiming adjustment is performed. Always perform it.

Work Procedure

INFOID:0000000009464824

1.CAMERA AIMING ADJUSTMENT

Perform the camera aiming adjustment with CONSULT. Refer to DAS-182, "Description".

>> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

Perform the self-diagnosis of rear view camera with CONSULT. Check if any DTC is detected.

Is any DTC detected?

YES >> Perform the trouble diagnosis for the detected DTC. Refer to DAS-164, "DTC Index".
NO >> GO TO 3.

3.LDW/BSW SYSTEM ACTION TEST

1. Perform the LDW/BSW system action test. Refer to DAS-179, "Description".
2. Check that the LDW/BSW system operates normally.

Is the inspection result normal?

YES >> Inspection End.
NO >> GO TO 4.

4.LDW/BSW ACTIVE TEST

1. Perform WASH ACTIVE on Active Test using CONSULT.
2. Perform air and washer tube connection check by AIR & WASH ACTIVE on Active Test:

(1) Washer fluid output count on the rear view camera is 3 to 5 times → OK
(2) Washer fluid output count on the rear view camera is 10 times → Check tube with yellow marking
(3) Washer fluid output count on the rear view camera is 1 time → Check tube with green marking
(4) No washer fluid output → Check tube with blue marking or check valve

>> Inspection End.

REAR VIEW CAMERA CALIBRATION

Description

INFOID:0000000009464825

Always perform the calibration after removing and installing or replacing the rear view camera.

CAUTION:

- **Place the vehicle on level ground when the calibration is performed.**
- **Follow the CONSULT when performing the calibration. (Rear view camera calibration cannot be operated without CONSULT).**

Work Procedure (Preparation)

INFOID:0000000009464826

1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis of the ITS control unit.

Is any DTC detected?

Except "U1308">> Perform diagnosis on the detected DTC and repair or replace the applicable item. Refer to DAS-164, "DTC Index".

"U1308" or no DTC>>GO TO 2.

2.PREPARATION BEFORE REAR VIEW CAMERA CALIBRATION

NOTE:

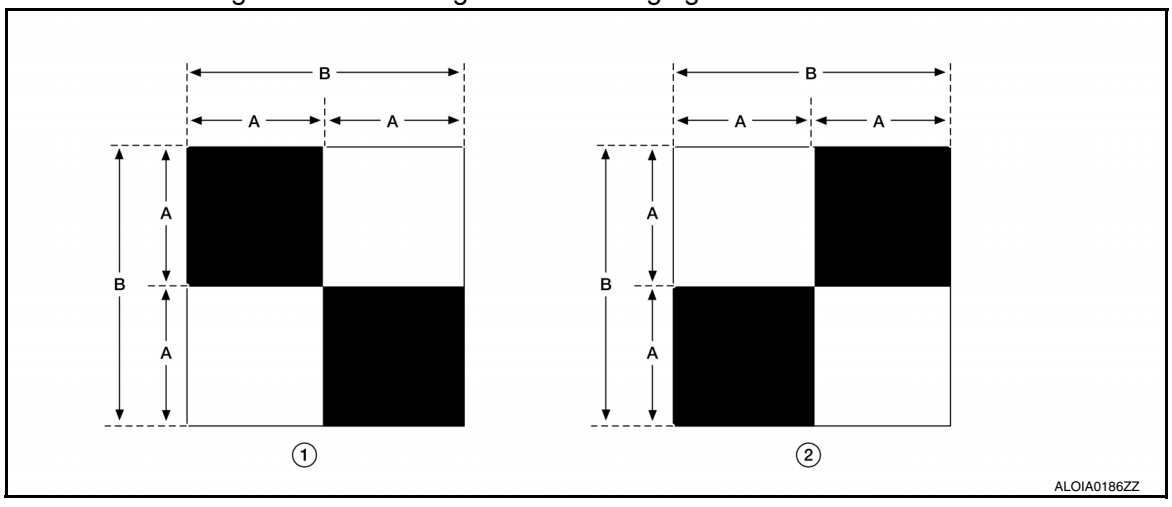
Select the "AVM" to diagnose the ITS control unit by CONSULT.

1. Perform pre-inspection for diagnosis. Refer to DAS-158, "CONSULT Function (AVM)".
2. Adjust the tire pressure to the specified pressure value.
3. Maintain no-load in vehicle.
4. Check if coolant and engine oil are filled up to correct level and fuel tank is full.
5. Situate vehicle where the camera is exposed at an atmosphere temperature between 0°C (32°F) and 30°C (86°F)
6. Move the shift selector to P (Park) and release the parking brake.
7. Clean the rear view camera.

>> GO TO 3.

3.PREPARATION OF CALIBRATION TARGET MARK

Prepare the calibration target mark according to the following figure:



(1) : Left and right targets

(2) : Center target

(A) : Side of the black or white area = 200 mm (7.87 in)

(B) : Side of the square target = 400 mm (15.75 in)

>> Refer to DAS-183, "Work Procedure (Target Setting)".

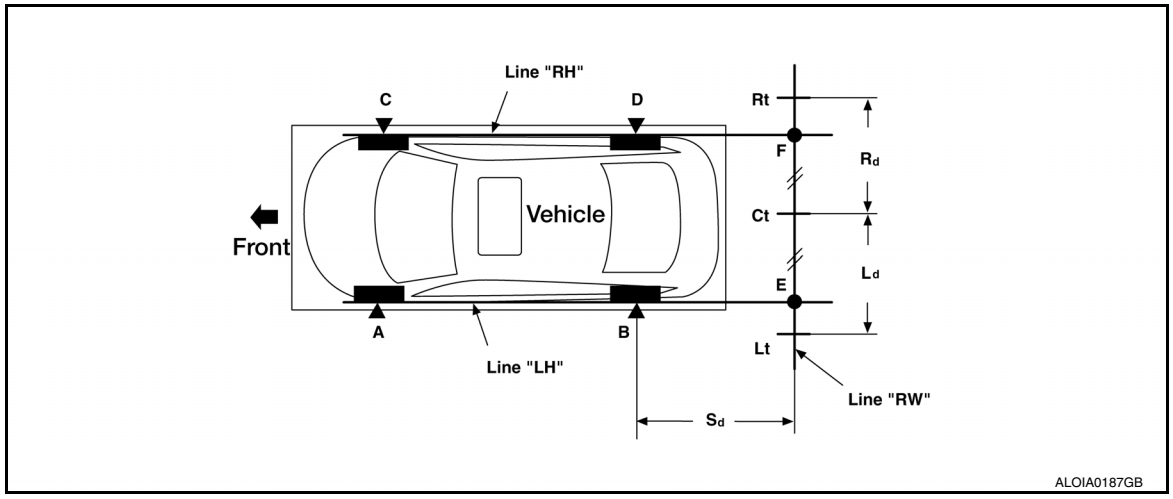
Work Procedure (Target Setting)

INFOID:0000000009464827

CAUTION:

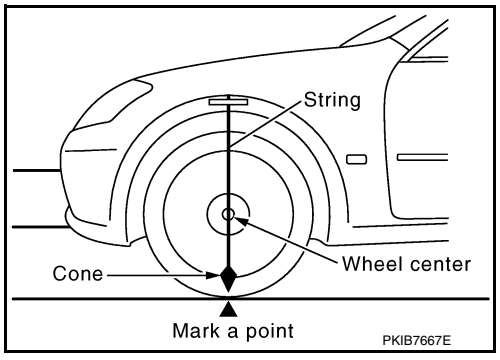
- **Perform this operation in a horizontal position where there is a clear view for 3 m (9.84 ft) backward and 4 m (13.12 ft) wide.**
- **Place the target in a well-lighted location. (Poor lighting may make it hard to adjust.)**
- **The target may not be detected when it shines by the reflected light of the sun or lighting.**
- **The target may not be detected when there is the same pattern of black and white as the target when the pattern is within 0.5 m (1.64 ft) from either side and upward/downward position from the target. (It is desirable that the vehicle is positioned on a single-color floor.)**

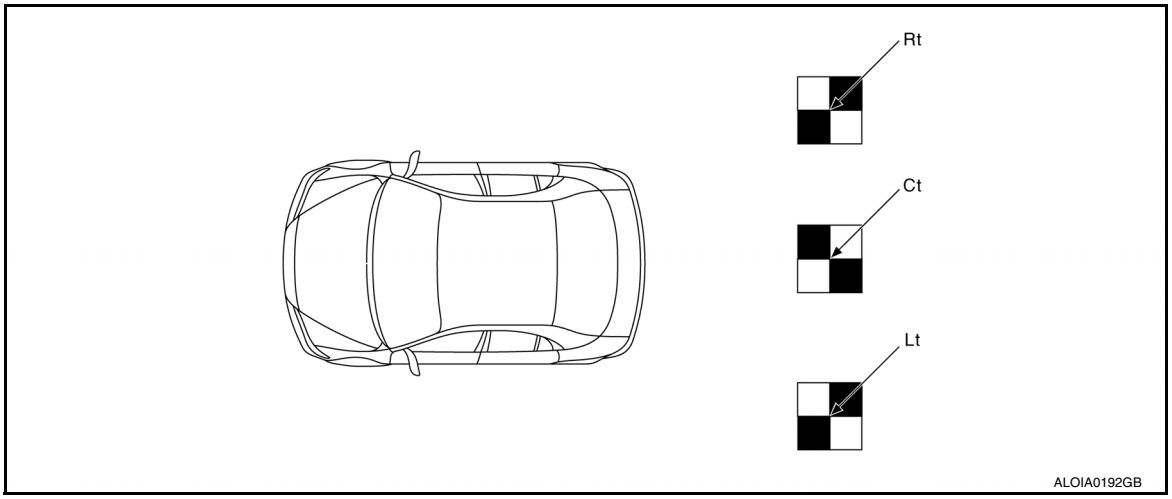
1. TARGET SETTING



Side distance (S_d): "B"–"E" ("D"–"F") : 2125 mm (83.66 in)
Left distance (L_d): "Ct"–"Lt" : 1500 mm (59.06 in)
Right distance (R_d): "Ct"–"Rt" : 1500 mm (59.06 in)

1. Mark points "A", "B", "C" and "D" at the center of the lateral surface of each wheel.
   NOTE:
   Hang a string with a cone from the fender so as to pass through the center of wheel, and then mark a point at the center of the lateral surface of the wheel.
2. Draw line "LH" passing through points "A" and "B" on the left side of vehicle.
   NOTE:
   Approximately 2.2 m (7.22 ft) or more at the rear from the rear axle.
3. Mark point "E" on the line "LH" at the positions 2125 mm (83.66 in) from point "B".
4. Draw line "RH" passing through points "C" and "D" on the right side of vehicle in the same way as step 2.
5. Mark point "F" on the line "RH" at the positions 2125 mm (83.66 in) from point "D".
6. Draw line "RW" passing through the points "E" and "F" on the rear of the vehicle.
   NOTE:
   Approximately 1.8 m (5.91 ft) or more at both left and right sides from vehicle center.
7. Mark point "Ct" at the center of point "E" and "F" on the line "RW".
   CAUTION:
   Make sure that "E" to "Ct" is equal to "F" to "Ct".
8. Mark point "Lt" and "Rt" on the line "RW" at the positions 1500 mm (59.06 in) from point "Ct".
9. Position the center of the target mark to point of "Ct".





CAUTION:
Make sure that the black/white pattern of the center target is rotated as compared with the left and right targets.

>> Go to DAS-184, "Work Procedure (Rear View Camera Calibration)".

Work Procedure (Rear View Camera Calibration)

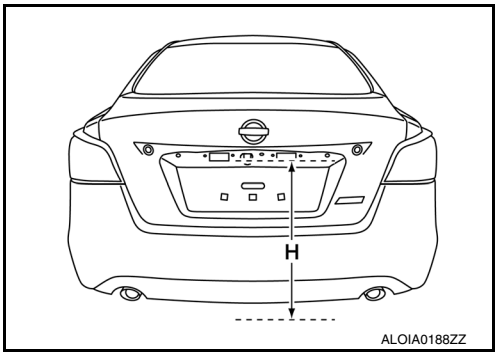
INFOID:0000000009464828

CAUTION:
Perform the calibration under the specified vehicle condition (fuel full, no-load, specified tire pressure, etc.). Refer to DAS-182, "Work Procedure (Preparation)".

1.CHECK REAR VIEW CAMERA HEIGHT

Measure the rear view camera height “H”.

>> GO TO 2.



2.REAR VIEW CAMERA CALIBRATION

1. Select “Work Support” on “AVM” with CONSULT.
2. Select “REAR CAMERA ITS”.
3. Select "OK".
   CAUTION:
   - **Perform the calibration after the ignition or engine has been kept on for at least 10 minutes to stabilize camera.**
   - **Operate CONSULT outside the vehicle, and close all doors to retain appropriate vehicle altitude.**
4. Input the rear view camera height "H", and then touch "APPLY".
5. Confirm that the same value is displayed on the center display.
6. Confirm the following items:

- The target should be accurately placed.
- The vehicle should be stopped.
- The vehicle should be under the specified vehicle condition.

7. Select “Start” to perform calibration.
8. Confirm the displayed item.

- “Completed”: Select “Completion”.
- Otherwise, perform the following services:

Displayed item		Possible cause	Service procedure
SUSPENSION	—	Temporary malfunction in internal processing of the rear view camera.	Go back to Step 1
	00H Routine not activated	Rear view camera unit malfunction.	Position the target appropriately again. Perform the aiming again. Refer to DAS-183, "Work Procedure (Target Setting)".
	10H Writing error	• Temporary malfunction in internal processing of the rear view camera. • Rear view camera malfunction.	
X AIMING NG Y (X: 0 - 7, Y: 1 - 8)	—	• A target is not-yet-placed. (The rear view camera cannot detect a target.) • The position of the rear view camera is not correct. • Inappropriate work environment. • Inappropriate vehicle condition.	Position the target appropriately again. Perform the aiming again. Refer to DAS-182, "Work Procedure (Preparation)".
ABNORMALLY COMPLETED	—		

NOTE:
Replace camera unit if “00H Routine not activated” or “10H Writing error” are repeatedly indicated during the above two services are performed.

9. Confirm that “Completed” is displayed and then select “End” to close the calibration procedure.

>> GO TO 3.

3.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis of ITS control unit with CONSULT.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the applicable item. Refer to DAS-164, "DTC Index".

NO >> GO TO 4.

4.ACTION TEST

Test the system operation by action test. Refer to DAS-179, "Description".

>> Work End.

DTC/CIRCUIT DIAGNOSIS

C1A03 VEHICLE SPEED SENSOR

DTC Logic

INFOID:0000000009464829

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
C1A03	VHCL SPEED SEN CIRC	ITS control unit detects that the result of calculation about velocity has error.	• ABS actuator and electric unit (control unit) • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the "C1A03" is detected as the current malfunction in "Self Diagnostic Result" of "AVM".

Is “C1A03” detected as the current malfunction?

YES >> Refer to DAS-186, "Diagnosis Procedure".
NO >> Refer to GI-43, "Intermittent Incident".

Diagnosis Procedure

INFOID:0000000009464830

1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts. Refer to BRC-45, "DTC Index".
NO >> GO TO 2.

2.CHECK ALL UNIT SELF-DIANOSIS RESULTS

Check if any DTC is detected except for ITS control unit about VDC in "ALL DTC READING" with CONSULT.

Is any DTC detected except for ITS?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-128, "Removal and Installation".
NO >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".

C1A04 ABS/TCS/VDC SYSTEM

DTC Logic

INFOID:0000000009464831

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
C1A04	VDC CIRCUIT	ITS control unit receives the message that means "VDC is failed" from ABS actuator and electric unit (control unit).	• ABS actuator and electric unit (control unit) • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the "C1A04" is detected as the current malfunction in "Self Diagnostic Result" of "AVM".

Is “C1A04” detected as the current malfunction?

YES >> Refer to DAS-187, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000009464832

1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts. Refer to BRC-45, "DTC Index".
NO >> GO TO 2.

2.CHECK ALL UNIT SELF-DIANOSIS RESULTS

Check if any DTC is detected except for ITS control unit about VDC in "ALL DTC READING" with CONSULT.

Is any DTC detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-128, "Removal and Installation".
NO >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".

C1A39 STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000009464833

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
C1A39	STRG SEN CIR	ITS control unit receives the message that means "Steering angle sensor is failed" from steering angle sensor.	• Steering angle sensor • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the "C1A39" is detected as the current malfunction in "Self Diagnostic Result" of "AVM".

Is “C1A39” detected as the current malfunction?

YES >> Refer to DAS-188, "Diagnosis Procedure".
NO >> Refer to GI-43, "Intermittent Incident".

Diagnosis Procedure

INFOID:0000000009464834

1.CHECK STRG SENSOR SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts. Refer to BRC-45, "DTC Index".
NO >> GO TO 2.

2.CHECK ALL UNIT SELF-DIANOSIS RESULTS

Check if any DTC is detected except for ITS control unit about ABS in "ALL DTC READING" with CONSULT.

Is any DTC detected except for ITS?

YES >> Replace steering angle sensor. Refer to BRC-132, "Removal and Installation".
NO >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".

U0122 VDC P-RUN DIAG

DTC Logic

INFOID:0000000009464835

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U0122	VDC P-RUN DIAG	ITS control unit receives the incorrect signal about P-RUN from VDC via V-CAN communication	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U0122” is detected as the current malfunction in self-diagnosis results of “AVM”.

Is “U0122” detected as the current malfunction?

YES >> Refer to DAS-189, "Diagnosis Procedure".
NO >> Refer to GI-43, "Intermittent Incident".

Diagnosis Procedure

INFOID:0000000009464836

1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts.
NO >> GO TO 2.

2.CHECK ITS CONTROL UNIT SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts.
NO >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-128, "Removal and Installation".

U0416 VDC CHECKSUM DIAG

DTC Logic

INFOID:0000000009464837

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U0416	VDC CHECKSUM DIAG	ITS control unit receives the incorrect signal about P-RUN from VDC via V-CAN communication	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U0416” is detected as the current malfunction in self-diagnosis results of “AVM”.

Is “U0416” detected as the current malfunction?

YES >> Refer to DAS-190, "Diagnosis Procedure".
NO >> Refer to GI-43, "Intermittent Incident".

Diagnosis Procedure

INFOID:0000000009464838

1.CHECK VDC UNIT SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts.
NO >> GO TO 2.

2.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts.
NO >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-128, "Removal and Installation".

U0428 STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000009464839

DTC	Display contents of CONSULT	DTC detection condition	Possible malfunction factor
U0428	ST ANGLE SENSOR CALIBRATION [U0428]	The neutral position adjustment of the steering angle sensor is incomplete.	Adjust neutral position of the steering angle sensor.

Diagnosis Procedure

INFOID:0000000009464840

1.ADJUST THE NEUTRAL POSITION OF THE STEERING ANGLE SENSOR

When U1232 is detected, adjust the neutral position of the steering angle sensor.

>> Perform adjustment of the neutral position of the steering angle sensor. Refer to BRC-33, "CONSULT Function (ABS)".

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000009464841

CAN COMMUNICATION

CAN (Controller Area Network) is a serial communication line for real time applications. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Modern vehicle is equipped with many electronic control units, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H, CAN-L) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads the required data only.
CAN communication signal chart. Refer to LAN-32, "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart".

ITS COMMUNICATION

- ITS communication is a multiplex communication system. This enables the system to transmit and receive large quantities of data at high speed by connecting control units with 2 communication lines.
- ITS communication lines adopt twisted-pair line style (two lines twisted) for noise immunity.

DTC Logic

INFOID:0000000009464842

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1000	CAN COMM CIRCUIT	If ITS control unit is not transmitting or receiving CAN communication signal or ITS communication signal for 2 seconds or more	• CAN communication system • ITS communication system

NOTE:
If “U1000” is detected, first diagnose the CAN communication system.

Diagnosis Procedure

INFOID:0000000009464843

1.PERFORM THE SELF-DIAGNOSIS

1. Turn the ignition switch ON.
2. Turn the MAIN switch of ITS system ON, and then wait for 30 seconds or more.
3. Perform “All DTC Reading” with CONSULT.
4. Check if the “U1000” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U1000” detected as the current malfunction?

YES >> Refer to DAS-192, "Description".
NO >> Refer to GI-43, "Intermittent Incident".

U1010 CONTROL UNIT (CAN)

Description

INFOID:0000000009464844

CAN controller controls the communication of CAN communication signal and ITS communication signal, and the error detection.

DTC Logic

INFOID:0000000009464845

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1010	CONTROL UNIT (CAN)	If ITS control unit detects malfunction by CAN controller initial diagnosis	ITS control unit

Diagnosis Procedure

INFOID:0000000009464846

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn the MAIN switch of ITS system ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U1010” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U1010” detected as the current malfunction?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Inspection End.

U111A REAR CAMERA IMAGE SIGNAL CIRCUIT

DTC Logic

INFOID:0000000009464847

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U111A	REAR CAMERA IMAGE SIGNAL	Rear camera image signal circuit is open or shorted	Check rear camera image signal circuit between rear camera and around view monitor control unit.

Diagnosis Procedure

INFOID:0000000009464848

Regarding Wiring Diagram information, refer to DAS-166, "Wiring Diagram".

1.CHECK CONTINUITY REAR CAMERA POWER SUPPLY AND GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect the ITS control unit connector and rear camera connector.
3. Check for continuity between ITS control unit harness connector and rear camera harness connector.

ITS control unit		Rear Camera		Continuity
Connector	Terminal	Connector	Terminal	
M59	51	B35	7	Yes
	52		8	

4. Check for continuity between ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M59	52		No

Is the inspection result normal?

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

2.CHECK VOLTAGE REAR CAMERA POWER SUPPLY

1. Connect the ITS control unit connector and rear camera connector.
2. Turn the ignition switch ON.
3. Check voltage between ITS control unit harness connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
ITS control unit				
Connector	Terminal			
M59	52	Ground	"CAMERA" switch is ON or shift selector is in R (Reverse)	6.2 V

Is inspection result normal?

YES >> GO TO 3.
NO >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".

3. CHECK CONTINUITY REAR CAMERA IMAGE SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect the ITS control unit connector and rear camera connector.
3. Check for continuity between ITS control unit harness connector and rear camera harness connector.

ITS control unit		Rear View Camera		Continuity
Connector	Terminal	Connector	Terminal	
M59	50	B35	1	Yes
	66		5	

4. Check for continuity between ITS control unit harness connector and ground.

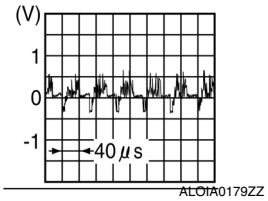
ITS control unit		Ground	Continuity
Connector	Terminal		
M59	50		No
	66		

Is inspection result normal?

YES >> GO TO 4.
NO >> Repair harness or connector.

4. CHECK REAR CAMERA IMAGE SIGNAL

1. Connect the ITS control unit connector and rear camera connector.
2. Turn the ignition switch ON.
3. Using an oscilloscope, check voltage between ITS control unit harness connector terminals.

Terminal				Condition	Voltage (Approx.)
(+)		(–)			
ITS control unit					
Connector	Terminal	Connector	Terminal		
M59	66	M59	50	"CAMERA" switch is ON or shift selector is in R (Reverse)	

Is inspection result normal?

YES >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Replace rear view camera. Refer to DAS-219, "Removal and Installation".

U1232 STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000009464849

DTC	Display contents of CONSULT	DTC detection condition	Possible malfunction factor
U1232	ST ANGLE SEN CALIB	The neutral position registration of the steering angle sensor cannot finish.	• Steering angle sensor • ITS control unit

Diagnosis Procedure

INFOID:0000000009464850

1.REGISTER THE NEUTRAL POSITION OF THE STEERING ANGLE SENSOR

1. Turn the ignition switch ON.
2. Perform registration of the neutral position of the steering angle sensor. Refer to DAS-158, "CONSULT Function (AVM)".
3. Check “Self Diagnostic Result” of “AVM” with CONSULT. Refer to DAS-158, "CONSULT Function (AVM)".

Is “ST ANGLE SEN CALIB” detected?

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

2.CHECK STEERING ANGLE SENSOR

Check steering angle sensor.

Is the inspection result normal?

YES >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

U1305 CAMERA IMAGE CALIB

DTC Logic

INFOID:0000000009464851

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1305	CAMERA CONFIG	ITS control unit configuration is incomplete	Perform ITS configuration with CONSULT

Diagnosis Procedure

INFOID:0000000009464852

1.CHECK SELF-DIAGNOSIS RESULTS

Check if “U1305” is current in “Self Diagnostic Result” of “AVM”.

Is “U1305” detected?

YES >> Perform ITS configuration using CONSULT. Refer to DAS-158, "CONSULT Function (AVM)". If problem persists, repair or replace the malfunctioning part.

NO >> Refer to GI-43, "Intermittent Incident".

U1308 CAMERA CONFIG

DTC Logic

INFOID:0000000009464853

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1308	ITS CALIB [U1308]	ITS control unit calibration is incomplete	Perform ITS calibration with CONSULT

Diagnosis Procedure

INFOID:0000000009464854

1.CHECK SELF-DIAGNOSIS RESULTS

Check if “U1308” is current in “Self Diagnostic Result” of “AVM”.

Is “U1308” detected?

YES >> Perform ITS calibration of camera image using CONSULT. Refer to DAS-158, "CONSULT Function (AVM)".

NO >> Refer to GI-43, "Intermittent Incident".

U1309 PUMP UNIT CURRENT

DTC Logic

INFOID:0000000009464855

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1309	PUMP UNIT CURRENT	ITS control unit detects the value of current from pump control unit is incorrect	• Rear view camera washer control unit • Harness • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U1309” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U1309” detected as the current malfunction?

YES >> Refer to DAS-199, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000009464856

Regarding Wiring Diagram information, refer to DAS-166, "Wiring Diagram".

1.CHECK REAR VIEW CAMERA AIR PUMP MOTOR POWER SUPPLY CIRCUIT

1. Disconnect the rear view camera washer control unit connector.
2. Turn the ignition switch ON.
3. Check voltage between rear view camera washer control unit connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
Rear view camera washer control unit				
Connector	Terminal			
B16	12	Ground	Ignition ON	12 V

Is inspection result normal?

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

2.CHECK REAR VIEW CAMERA AIR PUMP MOTOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Check for continuity between rear view camera washer control unit connector and ground.

Rear view camera washer control unit		Ground	Continuity
Connector	Terminal		
B16	5		Yes

Is the inspection result normal?

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

3.CHECK CONTINUITY ITS CONTROL UNIT TO REAR VIEW CAMERA WASHER CONTROL UNIT

1. Disconnect the ITS control unit connector.

2. Check for continuity between ITS control unit harness connector and rear view camera washer control unit connector.

ITS control unit		Rear view camera washer control unit		Continuity
Connector	Terminal	Connector	Terminal	
M58	2	B16	7	Yes
	3		8	

3. Check for continuity between ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	2		No
	3		

Is inspection result normal?

YES >> GO TO 4.
NO >> Repair the harness or connector.

4. CHECK CONTINUITY REAR VIEW CAMERA WASHER CONTROL UNIT TO PUMP

1. Disconnect rear view camera air pump connector.
2. Check for continuity between rear view camera washer control unit connector and pump connector.

Rear view camera washer control unit		Rear view camera air pump motor		Continuity
Connector	Terminal	Connector	Terminal	
B16	1	B17	1	Yes
	2		2	

3. Check for continuity between rear view camera washer control unit connector and ground.

Rear view camera washer control unit		Ground	Continuity
Connector	Terminal		
B16	1		No
	2		

Is inspection result normal?

YES >> GO TO 5.
NO >> Repair the harness or connector.

5. CHECK REAR VIEW CAMERA AIR PUMP MOTOR ITS CONTROL UNIT SUPPLY CIRCUIT

Momentarily connect a jumper from a fused battery positive to terminal 1 and from ground to terminal 2 of the rear view camera air pump motor.

Does the pump operate?

YES >> GO TO 6.
NO >> Replace the rear view camera air pump motor.

6. CHECK REAR VIEW CAMERA AIR PUMP MOTOR ITS CONTROL UNIT SUPPLY CIRCUIT

1. Reconnect the ITS control unit connector.
2. Turn the ignition switch ON.
3. Using CONSULT, activate the rear view camera air pump while checking voltage between rear view camera washer control unit connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
Rear view camera washer control unit				
Connector	Terminals			
B16	7, 8	Ground	Activating pump	5 V

Can voltage be measured on either terminal?

YES >> Replace rear view camera washer control unit.
NO >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".

U130B REAR CAMERA COMM ERROR

DTC Logic

INFOID:0000000009464857

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U130B	REAR CAMERA COMM ERROR	ITS control unit receives the incorrect communication signal from rear view camera.	• Rear view camera • Harness • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U130B” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U130B” detected as the current malfunction?

YES >> Refer to DAS-202, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000009464858

Regarding Wiring Diagram information, refer to DAS-166, "Wiring Diagram".

1.CONNECTOR CHECK

Check the ITS control unit and rear view camera connectors for the following:
- Proper connection
- Damage
- Disconnected or loose terminals

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair the terminal and connector.

2.CHECK REAR VIEW CAMERA VOLTAGE

1. Connect ITS control unit and rear view camera harness connectors.
2. Check voltage between ITS control unit connector M59 and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
ITS control unit				
Connector	Terminal			
M59	68	Ground	Ignition ON	5 V

Is the inspection result normal?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Replace rear view camera. Refer to DAS-219, "Removal and Installation".

U1310 PUMP UNIT CIRCUIT

DTC Logic

INFOID:0000000009464859

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1310	PUMP UNIT CIRCUIT	ITS control unit detects the value of voltage from pump control unit is incorrect	• Rear view camera washer control unit • Harness • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U1310” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U1310” detected as the current malfunction?

YES >> Refer to DAS-203, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000009464860

Regarding Wiring Diagram information, refer to DAS-166, "Wiring Diagram".

1.CHECK REAR VIEW CAMERA AIR PUMP MOTOR POWER SUPPLY CIRCUIT

1. Disconnect the rear view camera washer control unit connector.
2. Turn the ignition switch ON.
3. Check voltage between rear view camera washer control unit connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
Rear view camera washer control unit				
Connector	Terminal			
B16	12	Ground	Ignition ON	Battery voltage

Is inspection result normal?

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

2.CHECK REAR VIEW CAMERA AIR PUMP MOTOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Check for continuity between rear view camera washer control unit connector and ground.

Rear view camera washer control unit		Ground	Continuity
Connector	Terminal		
B16	5		Yes

Is the inspection result normal?

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

3.CHECK CONTINUITY ITS CONTROL UNIT TO REAR VIEW CAMERA WASHER CONTROL UNIT

1. Disconnect the ITS control unit connector.

2. Check for continuity between ITS control unit harness connector and rear view camera washer control unit connector.

ITS control unit		Rear view camera washer control unit		Continuity
Connector	Terminal	Connector	Terminal	
M58	2	B16	7	Yes
	3		8	

3. Check for continuity between ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	2		No
	3		

Is inspection result normal?

YES >> GO TO 4.
NO >> Repair the harness or connector.

4. CHECK CONTINUITY REAR VIEW CAMERA WASHER CONTROL UNIT TO PUMP

1. Disconnect rear view camera air pump connector.
2. Check for continuity between rear view camera washer control unit connector and pump connector.

Rear view camera washer control unit		Rear view camera air pump motor		Continuity
Connector	Terminal	Connector	Terminal	
B16	1	B17	1	Yes
	2		2	

3. Check for continuity between rear view camera washer control unit connector and ground.

Rear view camera washer control unit		Ground	Continuity
Connector	Terminal		
B16	1		No
	2		

Is inspection result normal?

YES >> GO TO 5.
NO >> Repair the harness or connector.

5. CHECK REAR VIEW CAMERA AIR PUMP MOTOR ITS CONTROL UNIT SUPPLY CIRCUIT

Momentarily connect a jumper from a fused battery positive to terminal 1 and from ground to terminal 2 of the rear view camera air pump motor.

Does the pump operate?

YES >> GO TO 6.
NO >> Replace the rear view camera air pump motor.

6. CHECK REAR VIEW CAMERA AIR PUMP MOTOR ITS CONTROL UNIT SUPPLY CIRCUIT

1. Reconnect the ITS control unit connector.
2. Turn the ignition switch ON.
3. Activate the rear view camera air pump while checking voltage between rear view camera washer control unit connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
Rear view camera washer control unit				
Connector	Terminals			
B16	7, 8	Ground	Activating pump	5 V

Can voltage be measured on either terminal?

YES >> Replace rear view camera washer control unit.
NO >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:0000000009464861

Regarding Wiring Diagram information, refer to DAS-166, "Wiring Diagram".

1.CHECK ITS CONTROL UNIT POWER SUPPLY CIRCUIT

Check voltage between ITS control unit harness connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
ITS control unit		Ground	Ignition switch	
Connector	Terminal			
M58	20		OFF	Battery voltage
			ON	Battery voltage
	39		OFF	0 V
			ON	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair the ITS control unit power supply circuit.

2.CHECK ITS CONTROL UNIT GROUND CIRCUIT

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

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	40		Yes

Is the inspection result normal?

YES >> Inspection End.
NO >> Repair the ITS control unit ground circuit.

WARNING SYSTEMS SWITCH CIRCUIT

Component Function Check

INFOID:0000000009464862

1.CHECK WARNING SYSTEMS SWITCH INPUT SIGNAL

1. Turn the ignition switch ON.
2. Select the DATA MONITOR item “ITS SW 1” of “AVM” with CONSULT.
3. With operating the warning systems switch, check the monitor status.

Monitor item	Condition	Monitor status
ITS SW 1	Warning systems switch is pressed	On
	Warning systems switch is not pressed	OFF

Is the inspection result normal?

YES >> Warning systems switch circuit is normal.
NO >> Refer to DAS-207, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000009464863

Regarding Wiring Diagram information, refer to DAS-166, "Wiring Diagram".

1.CHECK WARNING SYSTEMS SWITCH SIGNAL INPUT

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

Terminals			Condition	Voltage (Approx.)
(+)		(–)		
ITS control unit		Ground	Warning systems switch	
Connector	Terminal			
M58	32		Pressed	0 V
			Released	12 V

Is the inspection result normal?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> GO TO 2.

2.CHECK WARNING SYSTEMS SWITCH

1. Turn ignition switch OFF.
2. Remove warning systems switch.
3. Check warning systems switch. Refer to DAS-208, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace the warning systems switch. Refer to DAS-217, "Removal and Installation".

3.CHECK WARNING SYSTEMS SWITCH GROUND CIRCUIT

Check continuity between warning system switch harness connector terminal and ground.

Warning system switch		Ground	Continuity
Connector	Terminal		
M62	8		Yes

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4.CHECK WARNING SYSTEMS SWITCH SIGNAL INPUT CIRCUIT FOR OPEN

1. Disconnect the ITS control unit connector.
2. Check continuity between the ITS control unit harness connector and warning system switch harness connector.

ITS control unit		Warning system switch		Continuity
Connector	Terminal	Connector	Terminal	
M58	32	M62	6	Yes

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair the harnesses or connectors.

5.CHECK WARNING SYSTEMS SWITCH SIGNAL INPUT CIRCUIT FOR SHORT

Check continuity between the ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	32		No

Is the inspection result normal?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Repair the harnesses or connectors.

Component Inspection

INFOID:0000000009464864

1.CHECK WARNING SYSTEMS SWITCH

Check continuity of warning systems switch.

Terminal		Condition	Continuity
6	8	When warning systems switch is pressed	Yes
		When warning systems switch is released	No

Is the inspection result normal?

YES >> Inspection End.
NO >> Replace the warning systems switch. Refer to DAS-217, "Removal and Installation".

WARNING SYSTEMS ON INDICATOR CIRCUIT

Component Function Check

INFOID:0000000009464865

1.CHECK WARNING SYSTEMS ON INDICATOR

1. Turn the ignition switch ON.
2. Select the active test item “BSW ON INDICATOR” of “AVM” with CONSULT.
3. With operating the test item, check the operation.

On : Warning systems ON indicator illuminates
Off : Warning systems ON indicator is turned OFF

Is the inspection result normal?

YES >> Inspection End.
NO >> Refer to DAS-209, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000009464866

Regarding Wiring Diagram information, refer to DAS-166, "Wiring Diagram".

1.CHECK WARNING ON INDICATOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect warning system switch connector.
3. Turn ignition switch ON.
4. Check voltage between warning system switch harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(−)	
Warning system switch		Ground	
Connector	Terminal		
M62	5		Battery voltage

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair the warning systems ON indicator power supply circuit.

2.CHECK WARNING SYSTEMS ON INDICATOR SIGNAL FOR OPEN

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

ITS control unit		Warning system switch		Continuity
Connector	Terminal	Connector	Terminal	
M58	33	M62	3	Yes

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair the harnesses or connectors.

3.CHECK WARNING SYSTEMS ON INDICATOR SIGNAL CIRCUIT FOR SHORT

Check continuity between the ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	33		No

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair the harnesses or connectors.

4.CHECK WARNING SYSTEMS ON INDICATOR

Check the warning systems ON indicator. Refer to DAS-210, "Component Inspection".

Is the inspection result normal?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Replace warning systems switch. DAS-217, "Removal and Installation".

Component Inspection

INFOID:0000000009464867

1.CHECK WARNING SYSTEMS ON INDICATOR

Apply battery voltage to warning systems switch terminals 3 and 5, and then check if the warning systems ON indicator illuminates.

Terminals		Condition	Warning systems ON indicator
(+)	(-)		
5	3	When the battery voltage is applied	On
		When the battery voltage is not applied	Off

Is the inspection result normal?

YES >> Inspection End.
NO >> Replace the warning systems switch. Refer to DAS-217, "Removal and Installation".

WARNING BUZZER CIRCUIT

Component Function Check

INFOID:0000000009464868

1.CHECK WARNING BUZZER

1. Turn the ignition switch ON.
2. Select the active test item “BUZZER” of “BCM” with CONSULT.
3. With operating the test item, check the operation.

On : Warning buzzer is activated.
Off : Warning buzzer is not activated.

Is the inspection result normal?

YES >> Inspection End.
NO >> Refer to DAS-211, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000009464869

1.CHECK WARNING BUZZER OPERATION

While activating the buzzer with CONSULT, listen for the buzzer sound.

Does warning buzzer sound?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Replace the combination meter (buzzer).

SYMPTOM DIAGNOSIS

BSW SYSTEM SYMPTOMS

Symptom Table

INFOID:0000000009464870

CAUTION:
Perform the self-diagnosis with CONSULT before the symptom diagnosis. Perform the trouble diagnosis if any DTC is detected.
NOTE:
Refer to the following for operating conditions of the Blind Spot Warning system.
- Blind Spot Warning system: DAS-152, "System Description".

Symptom		Possible cause	Inspection item/Reference page
Indicator/warning lamps do not illuminate when ignition switch OFF ⇒ ON.	Blind Spot Warning lamp (orange) does not illuminate	• Blind Spot Warning warning lamp signal (CAN) - Combination meter - ITS control unit • Blind Spot Warning lamp (combination meter)	• ITS control unit Active test “BSW WARNING LAMP”. Refer to DAS-158, "CONSULT Function (AVM)". • ITS control unit Data monitor “BSW WARN LMP”. Refer to DAS-158, "CONSULT Function (AVM)". • Combination meter Data monitor “BSW W/L”. Refer to MWI-18, "CONSULT Function (METER/M&A)".
	Blind Spot Warning/Backup Collision Warning lamp (orange) do not illuminate	• Combination meter • ITS control unit	
	All of indicator/warning lamps do not illuminate; • Blind Spot Warning lamp • Warning systems ON indicator	• Power supply and ground circuit of ITS control unit • ITS control unit • Combination meter	Power supply and ground circuit of ITS control unit. Refer to DAS-206, "Diagnosis Procedure".
	Warning systems ON indicator (on the warning systems switch) does not illuminate	• Harness between ITS control unit and warning systems switch • Warning systems switch • ITS control unit	Warning systems ON indicator circuit. Refer to DAS-209, "Diagnosis Procedure".
	Blind Spot Warning indicator does not turn ON	• Harness between ITS control unit and Blind Spot Warning indicator • Blind Spot Warning indicator	Perform self-diagnosis of Blind Spot Warning indicator. Refer to DAS-158, "CONSULT Function (AVM)".
BSW system is not activated. (Indicator/warning lamps illuminate when ignition switch OFF ⇒ ON.)	Warning systems ON indicator is not turned ON ⇔ OFF when operating warning systems switch	• Harness between ITS control unit and waning systems switch • Harness between warning systems switch and ground • ITS control unit • Warning systems switch	• Warning systems switch circuit. Refer to DAS-207, "Diagnosis Procedure". • BSW system setting cannot be turned ON/OFF on the navigation screen. Refer to DAS-215, "Description".
	Buzzer is not sounding	• Combination meter (warning buzzer) • ITS control unit	Combination meter. Refer to DAS-211, "Component Function Check".
Blind Spot Warning functions are not timely (Example) • Does not function when approaching a lane marker with a vehicle in the blind spot. • Functions when driving in the middle of lane.		• Camera aiming • Lane camera unit	Camera aiming. Refer to DAS-182, "Description".

SWITCH DOES NOT TURN ON / SWITCH DOES NOT TURN OFF

Description

INFOID:0000000009464871

The switch does not turn ON
- When the Blind Spot Warning system setting is ON, the Blind Spot Warning ON indicator does not illuminate even if the warning system switch is depressed.

The switch does not turn OFF
- The Blind Spot Warning ON indicator does not turn off even if the warning system switch is pressed when the Blind Spot Warning ON indicator illuminates.

Diagnosis Procedure

INFOID:0000000009464872

1.CHECK BLIND SPOT WARNING SYSTEM SETTING

1. Start the engine.
2. After starting the engine wait for 5 seconds or more.
3. Check that Blind Spot Warning system setting on the vehicle information display screen is ON.

Is Blind Spot Warning system setting ON?

YES >> GO TO 2.
NO >> Enable the Blind Spot Warning system setting.

2.WARNING SYSTEM SWITCH INSPECTION

1. Start the engine.
2. Check that warning system switch operates normally in “DATA MONITOR” of “AVM” with CONSULT.

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 5.

3.CHECK BLIND SPOT WARNING ON INDICATOR CIRCUIT

1. Start the engine.
2. Select the active test item “BSW ON IND” of “AVM” with CONSULT.
3. Check if the Blind Spot Warning ON indicator illuminates when the test item is operated.

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 4.

4.PERFORM THE SELF-DIAGNOSIS OF COMBINATION METER

1. Perform “All DTC Reading” with CONSULT.
2. Check if the DTC is detected in self-diagnosis results of “METER/M&A”. Refer to MWI-27, "DTC Index".

Is the inspection result normal?

YES >> GO TO 6.
NO >> GO TO 5.

5.PERFORM THE SELF-DIAGNOSIS

1. Perform “All DTC Reading” with CONSULT.
2. Check if the DTC is detected in self-diagnosis results of “AVM”. Refer to DAS-164, "DTC Index".

Is any DTC detected?

YES >> GO TO 6.
NO >> GO TO 7.

6.REPAIR OR REPLACE MALFUNCTIONING PARTS.

Repair or replace malfunctioning parts.

>> GO TO 7.

7.CHECK BLIND SPOT WARNING SYSTEM

1. Erase “self-diagnosis result”, and then perform “All DTC Reading” again after performing the action test. (Refer to DAS-179, "Description" for action test.)
2. Check that the Blind Spot Warning system is normal.

>> Inspection End.

BSW SYSTEM SETTINGS CANNOT BE TURNED ON/OFF IN VEHICLE INFORMATION DISPLAY

Description

INFOID:0000000009464873

- BSW system setting is not selectable on the vehicle information display screen.
- **NOTE:**
  When the ignition switch is in ACC position, Blind Spot Warning system setting cannot be changed.
- "Blind Spot Warning" is not indicated on the vehicle information display screen.
- The switching between ON and OFF cannot be performed by operating the Setting screen on the vehicle information display system.
- The item "Blind Spot Warning" on the vehicle information display screen is not active.
- The Blind Spot Warning system setting differs from the one set at the previous driving.
  NOTE:
  Turn OFF the ignition switch and wait for 5 seconds or more.

Diagnosis Procedure

INFOID:0000000009464874

1.CHECK BLIND SPOT WARNING SYSTEM SETTING

1. Start the engine.
2. Check that the Blind Spot Warning system settings is selectable on the vehicle information display screen.

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 2.

2.PERFORM THE SELF-DIAGNOSIS

1. Perform self-diagnosis with CONSULT.
2. Check if the DTC is detected in self-diagnosis results of "AVM", "MULTI AV" and "METER/M&A". Refer to the following:

- AVM: DAS-164, "DTC Index"
- MULTI AV (with BOSE): AV-328, "DTC Index"
- MULTI AV (without BOSE): AV-231, "DTC Index"
- METER/M&A: MWI-27, "DTC Index"

Is any DTC detected?

YES >> Repair or replace malfunctioning parts.
NO >> Inspection End.

3.CHECK DATA MONITOR OF ITS CONTROL UNIT

Check that "BSW SELECT" operates normally in "DATA MONITOR" of "AVM" with CONSULT.

Is the inspection result normal?

YES >> Refer to DAS-158, "CONSULT Function (AVM)".
NO >> GO TO 4.

4.CHECK MULTIFUNCTION SWITCH

Operate the multifunction switch to check that the audio, navigation system, and air conditioner operate properly.

Is the inspection result normal?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

NORMAL OPERATING CONDITION

Description

INFOID:0000000009464875

PRECAUTIONS FOR BLIND SPOT WARNING (BSW)

- The Blind Spot Warning system is not a replacement for proper driving procedure and are not designed to prevent contact with vehicles or objects. When changing lanes, always use the side and rear mirrors and turn and look in the direction driver will move to ensure it is safe to change lanes. Never rely solely on the Blind Spot Warning system.
- The Blind Spot Warning system may not provide a warning for vehicles that pass through the detection zone quickly.
- Do not use the Blind Spot Warning system when towing a trailer.
- Excessive noise (e.g., audio system volume, open vehicle window) will interfere with the chime sound, and it may not be heard.
- The rear view camera may not be able to detect and activate Blind Spot Warning when certain objects are present such as:
  - Pedestrians, bicycles, animals.
  - Several types of vehicles such as motorcycles.
  - Oncoming vehicles.
  - Vehicles remaining in the detection zone when driver accelerates from a stop.
  - A vehicle merging into an adjacent lane at a speed approximately the same as vehicle.
  - A vehicle approaching rapidly from behind.
  - Another vehicle which overtakes this vehicle rapidly.
- Severe weather or road spray conditions may reduce the ability of the rear view camera to detect other vehicles.
- The rear view camera detection zone is designed based on a standard lane width. When driving in a wider lane, the rear view camera may not detect vehicles in an adjacent lane. When driving in a narrow lane, the rear view camera may detect vehicles driving two lanes away.
- The rear view camera is designed to ignore most stationary objects, however objects such as guardrails, walls, foliage and parked vehicles may occasionally be detected. This is a normal operating condition.

PRECAUTIONS FOR BLIND SPOT WARNING

- Do not use the Blind Spot Warning system under the following conditions because the system may not function properly:
  - During bad weather (e.g., rain, fog, snow, wind, etc.)
  - When driving on slippery roads, such as on ice or snow, etc.
  - When driving on winding or uneven roads.
  - When there is a lane closure due to road repairs.
  - When driving in a makeshift lane.
  - When driving on roads where the lane width is too narrow.
  - When driving with a tire that is not within normal tire conditions (e.g., tire wear, low tire pressure, installation of spare tire, tire chains, non-standard wheels).
  - When the vehicle is equipped with non-original brake parts or suspension parts.
- The rear view camera may not detect lane markers in the following situations and the Blind Spot Warning system may not operate properly:
  - On roads where there are multiple parallel lane markers; lane markers that are faded or not painted clearly; yellow painted lane markers; nonstandard lane markers; lane markers covered with water, dirt, snow, etc.
  - On roads where discontinued lane markers are still detectable.
  - On roads where there are sharp curves.
  - On roads where there are sharply contrasting objects, such as shadows, snow, water, wheel ruts, seams or lines remaining after road repairs.
  - On roads where the traveling lane merges or separates.
  - When the vehicle traveling direction does not align with the lane markers.
  - When rain, snow or dirt adheres to the lens of a the rear view camera unit.
  - When a sudden change in brightness occurs. (e.g., when the vehicle enters or exits a tunnel or under a bridge.)
  - When steering quickly.
  - When the hazard warning flashers are operated.
  - When driving on a curve at a high speed.

REMOVAL AND INSTALLATION

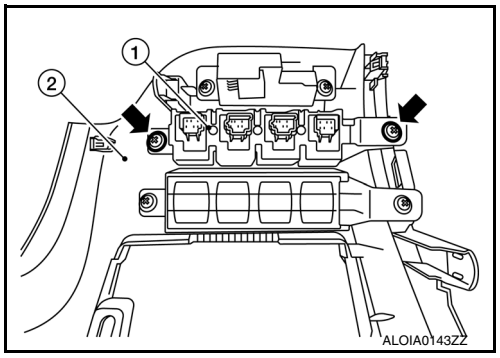
WARNING SYSTEMS SWITCH

Removal and Installation

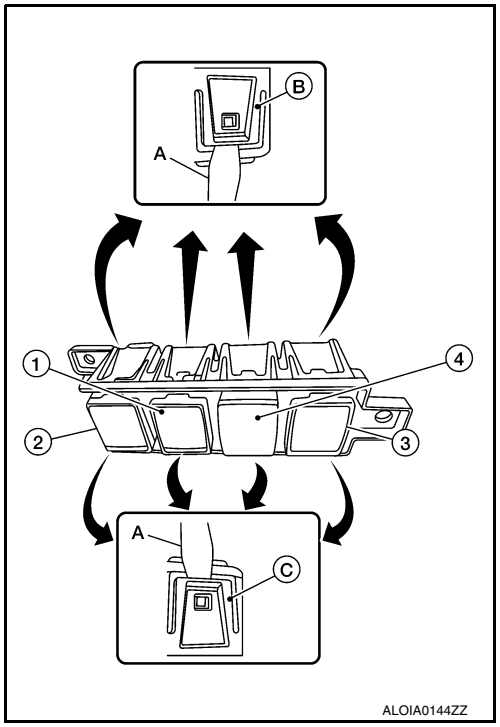
INFOID:0000000009464878

REMOVAL

1. Remove the instrument lower panel LH. Refer to IP-21, "Removal and Installation".
2. Remove screws (⬅) that retain the upper switch carrier (1) to the instrument lower panel LH (2).



3. Release upper tab (B) and lower tab (C) using a suitable tool (A), then remove the warning system switch (4) from the upper switch carrier.
   (1) Trunk opener switch
   (2) VDC switch
   (3) Heated steering wheel switch



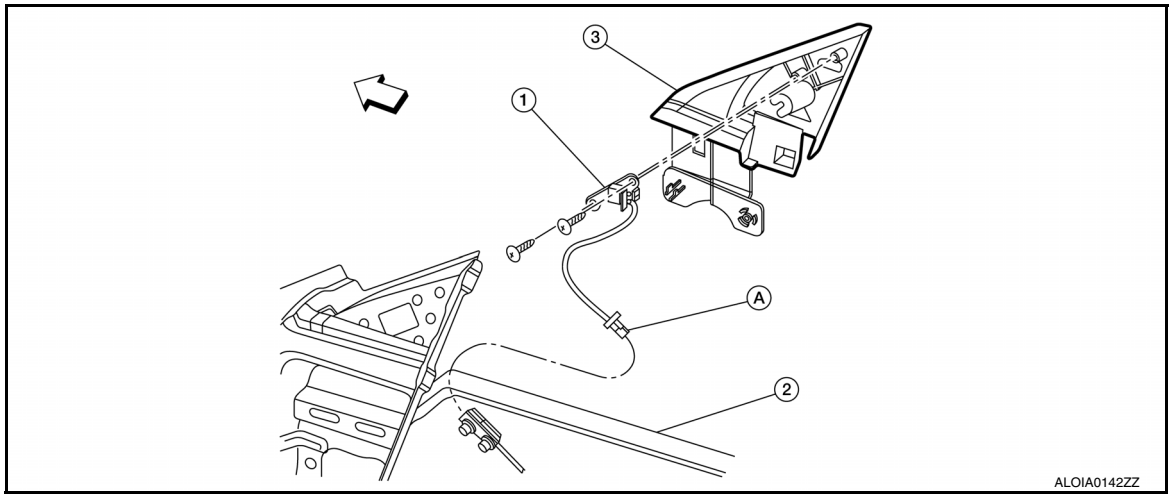
INSTALLATION

Installation is in the reverse order of removal.

BSW INDICATOR

Exploded View

INFOID:0000000009464879



1. Blind spot warning indicator
2. Front door
3. Door mirror corner finisher
A. Blind spot warning indicator harness connector
⇦ Front

NOTE:
LH side shown; RH side similar.

Removal and Installation

INFOID:0000000009464880

REMOVAL AND INSTALLATION

Removal

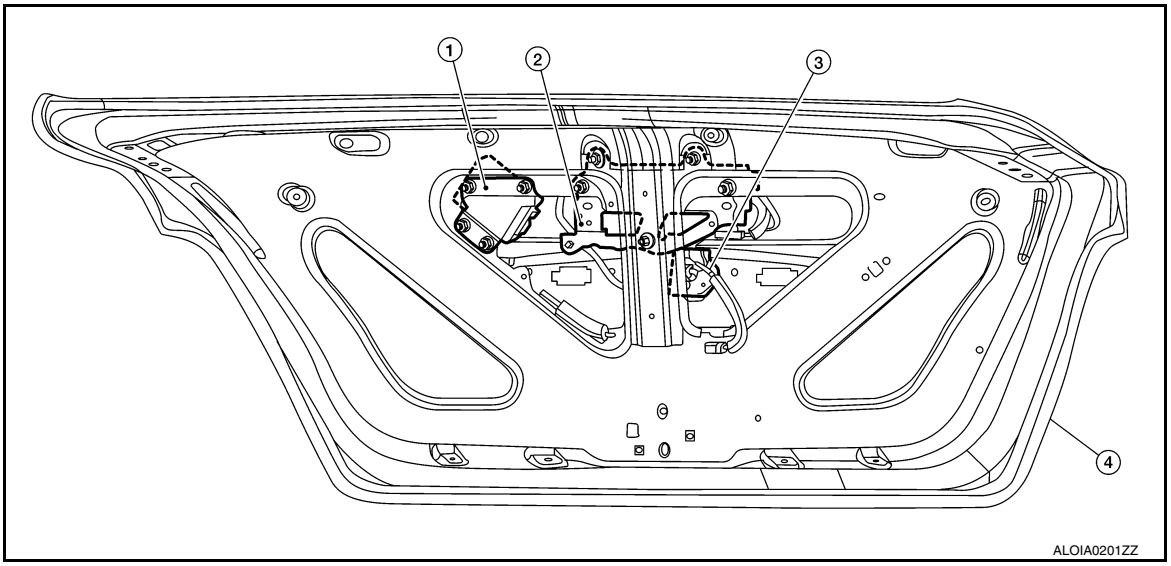
1. Remove the front door finisher. Refer to MIR-20, "Removal and Installation".
2. Remove the door mirror corner finisher using a suitable tool.
3. Remove the blind spot warning indicator screws.
4. Remove the blind spot warning indicator.

Installation
Installation is in the reverse order of removal.

REAR VIEW CAMERA

Exploded View

INFOID:0000000009978545



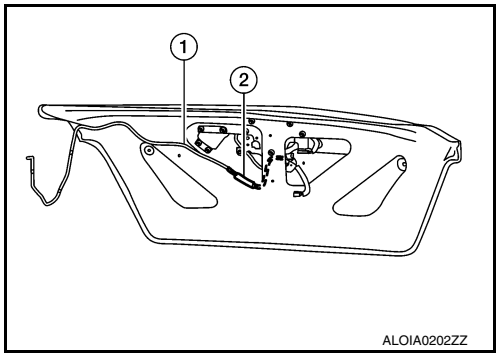
1. Rear view camera washer control unit
2. Rear view camera air pump motor
3. Rear view camera
4. Trunk lid

Removal and Installation

INFOID:0000000009464881

REMOVAL

1. Remove rear view camera air pump motor. Refer to DAS-145, "Removal and Installation".
2. Disconnect the rear washer tube (1) from rear view camera (2).



3. Disconnect the harness connector from the rear view camera and remove.

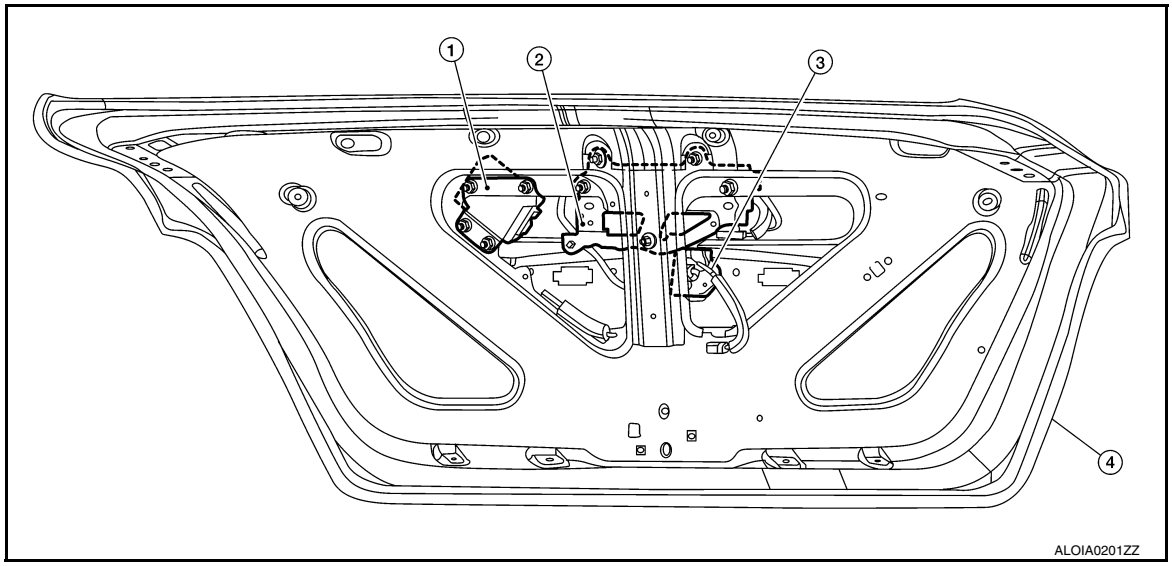
INSTALLATION

Installation is in the reverse order of removal.

REAR VIEW CAMERA WASHER CONTROL UNIT

Exploded View

INFOID:0000000009464876



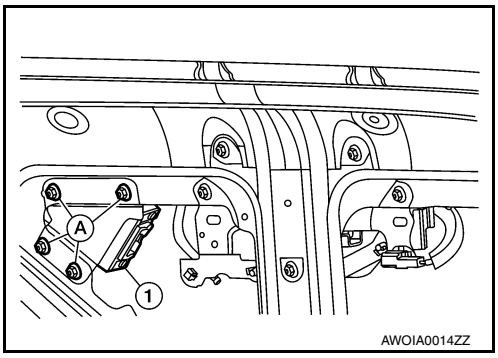
1. Rear view camera washer control unit
2. Rear view camera air pump motor
3. Rear view camera
4. Trunk lid

Removal and Installation

INFOID:0000000009464877

REMOVAL

1. Remove the trunk lid finisher. Refer to INT-33, "TRUNK LID FINISHER : Removal and Installation".
2. Disconnect the harness connector from the rear view camera washer control unit.
3. Remove the rear view camera washer control unit nuts (A).
4. Remove the rear view camera washer control unit (1).



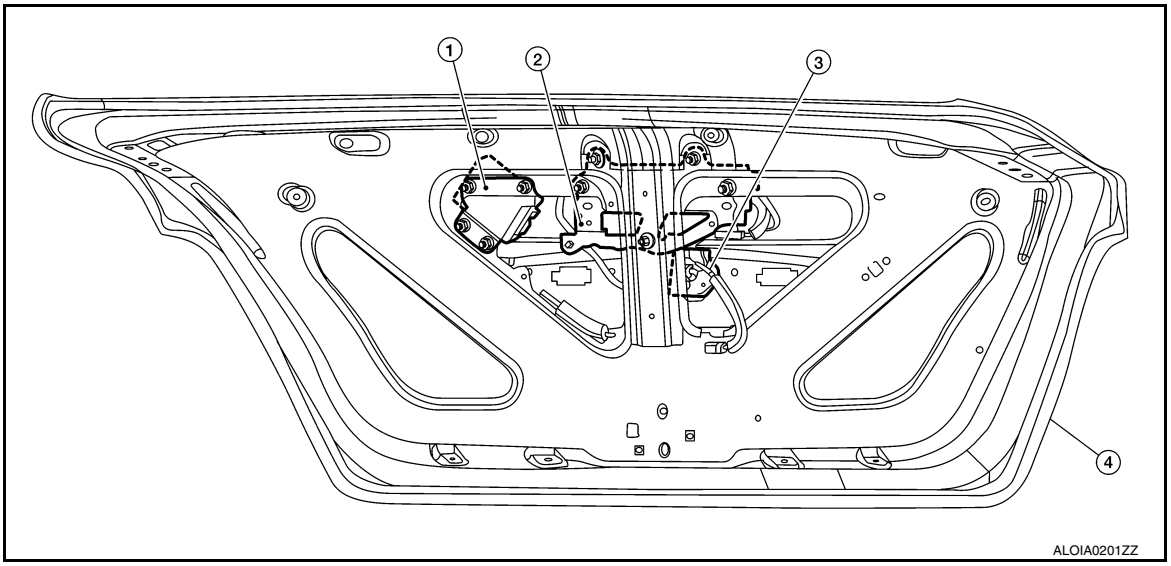
INSTALLATION

Installation is in the reverse order of removal.

REAR VIEW CAMERA AIR PUMP MOTOR

Exploded View

INFOID:0000000009464882



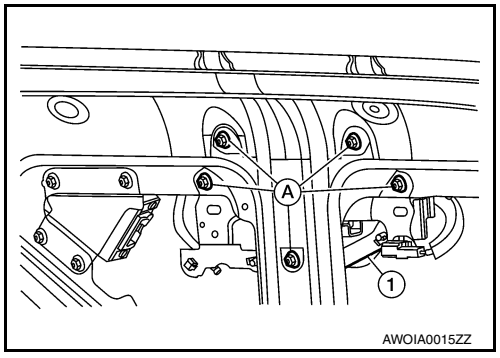
1. Rear view camera washer control unit
2. Rear view camera air pump motor
3. Rear view camera
4. Trunk lid

Removal and Installation

INFOID:0000000009464883

REMOVAL

1. Remove the trunk lid finisher. Refer to INT-33, "TRUNK LID FINISHER : Removal and Installation".
2. Disconnect the air tubes from the rear view camera air pump motor.
3. Disconnect the harness connector from the rear view camera air pump motor.
4. Remove the rear view camera air pump motor bracket nuts (A).
5. Remove the rear view camera air pump motor (1).



INSTALLATION

Installation is in the reverse order of removal.

PRECAUTION

PRECAUTIONS

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

INFOID:0000000009951656

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, 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 three minutes before performing any service.**

Precaution for Work

INFOID:0000000009464885

- 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.

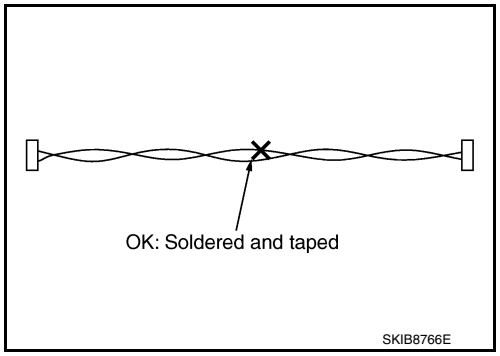
- Do not use organic solvent such as thinner, benzene, alcohol or gasoline.
- For genuine leather seats, use a genuine leather seat cleaner.

Precautions For Harness Repair

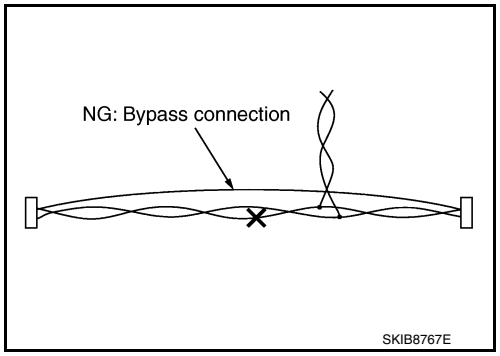
INFOID:0000000009464886

ITS communication uses a twisted pair line. Be careful when repairing it.

- Solder the repaired area and wrap tape around the soldered area.
  NOTE:
  A fray of twisted lines must be within 110 mm (4.33 in).



- Bypass connection is never allowed at the repaired area.
  NOTE:
  Bypass connection may cause ITS communication error. The spliced wire becomes separated and the characteristics of twisted line are lost.



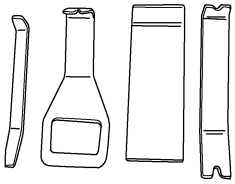
PREPARATION

PREPARATION

Special Service Tool

INFOID:0000000009464887

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

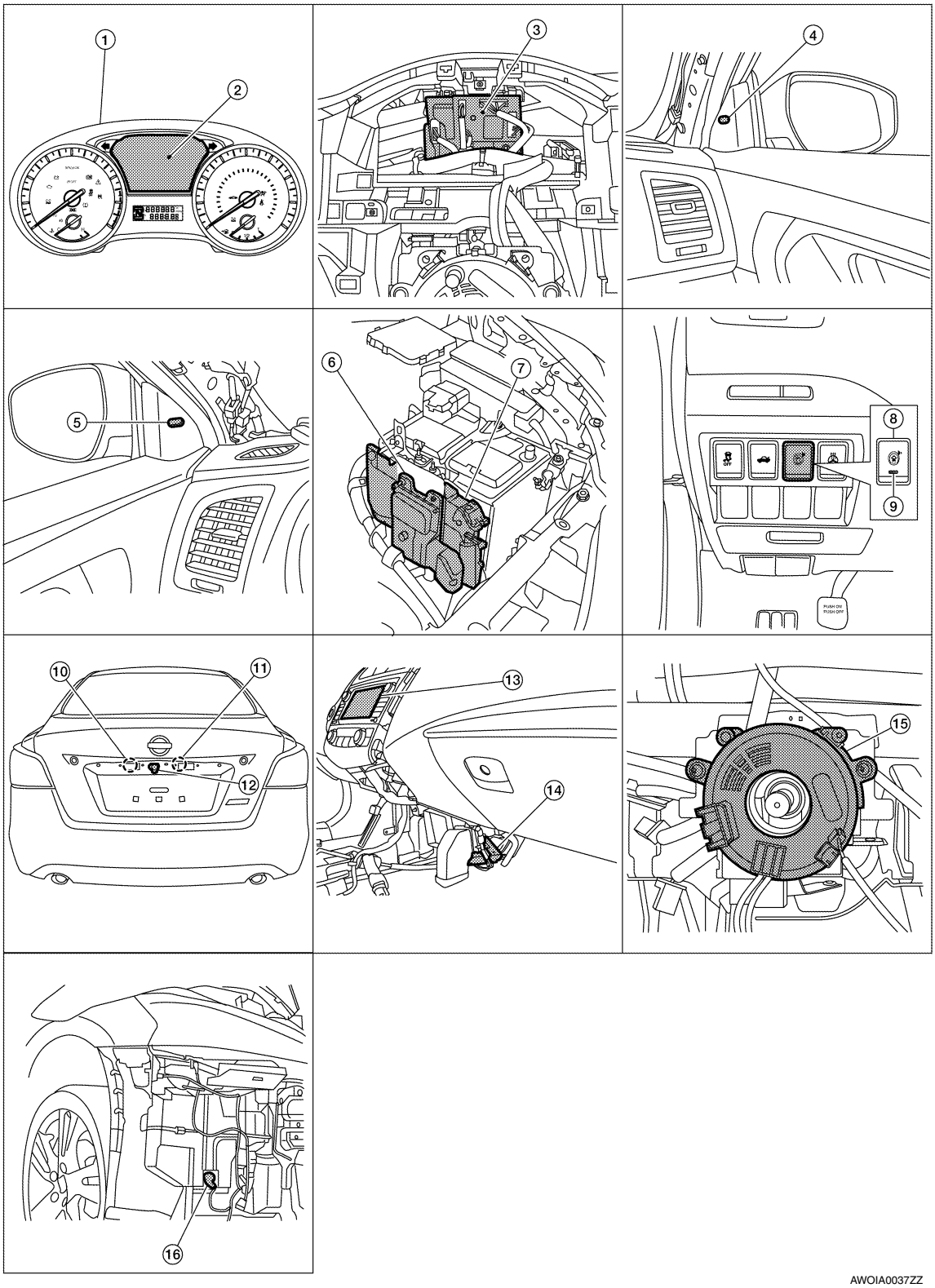
Tool number (TechMate No.) Tool name	Description
— (J-46534) Trim Tool Set  AWJIA0483ZZ	Removing trim components

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000009464888



AWOIA0037ZZ

1. Combination meter
2. Vehicle information display
3. BCM (view with combination meter removed)
4. Blind spot warning indicator RH
5. Blind spot warning indicator LH
6. TCM
7. ECM
8. Warning systems switch
9. Warning systems ON indicator
10. Rear view camera washer control unit
11. Rear view camera air pump motor
12. Rear view camera
13. AV control unit (center display) (with navigation system and bose audio system) Audio unit (center display) (with display audio system and bose audio system)
14. ITS control unit (view with center console removed)
15. Steering angle sensor (view with steering wheel removed)
16. Washer fluid level switch (view with front fascia removed)

Component Description

INFOID:0000000009464889

Component	Description
ITS control unit	• Being connected with rear view camera via ITS communication, receives vehicle detection signal and transmits Moving Object Detection indicator signal and Moving Object Detection indicator dimmer signal to rear view camera • Being connected with rear view camera unit via ITS communication, receives detected rear condition signal • Receives steering angle sensor signal from steering angle sensor via CAN communication • Judges a Moving Object Detection indicator ON/OFF state and an approach state to the rear proximity of the vehicle. • Activates the warning buzzer and warning systems ON indicator • Transmits Moving Object Detection lamp signal to combination meter via CAN communication
Blind Spot Warning indicator LH/RH	Receives Moving Object Detection indicator operation signal from rear view camera and turns OFF, turns ON or blinks
Warning system switch	Inputs the switch signal to ITS control unit
Warning system switch indicator (on the warning systems switch)	Indicates Moving Object Detection system status
Rear view camera	• Detects the lane marker by the built-in camera • Transmits detected lane condition signal to ITS control unit
ABS actuator and electric unit (control unit)	• Transmits vehicle speed signal to ITS control unit via CAN communication • Transmits yaw rate signal/side G sensor signal to ITS control unit via CAN communication
Buzzer (combination meter)	Receives buzzer signal from ITS control unit via CAN and sounds buzzer.
Combination meter (vehicle information display)	• Turns the Moving Object Detection (MOD) warning indicator ON/OFF according to the signals from the ITS control unit via CAN communication • Receives MOD ON indicator signal via CAN communication.
Steering angle sensor	Transmits steering angle sensor signal to ITS control unit via CAN communication
BCM	• Transmits turn signal indicator to ITS control unit via CAN communication • Transmits dimmer signal to ITS control unit via CAN communication
ECM	Transmits engine speed signal to ITS control unit via CAN communication
TCM	Transmits the output shaft speed signal, input speed signal, current gear position signal and shift position signal to ITS control unit via CAN communication
Center display	Displays the various system screen signals according to the priority level received via CAN communication
AV control unit (with navigation system and bose audio system)	Receives the various systems and camera signals via CAN communication and routes them to the center display
Audio unit (with display audio system and bose audio system)	Receives the various systems and camera signals and routes them to the center display
Rear view camera washer control unit	Controls the air pump to drive air to the rear camera lens according to the signals received from the ITS control unit

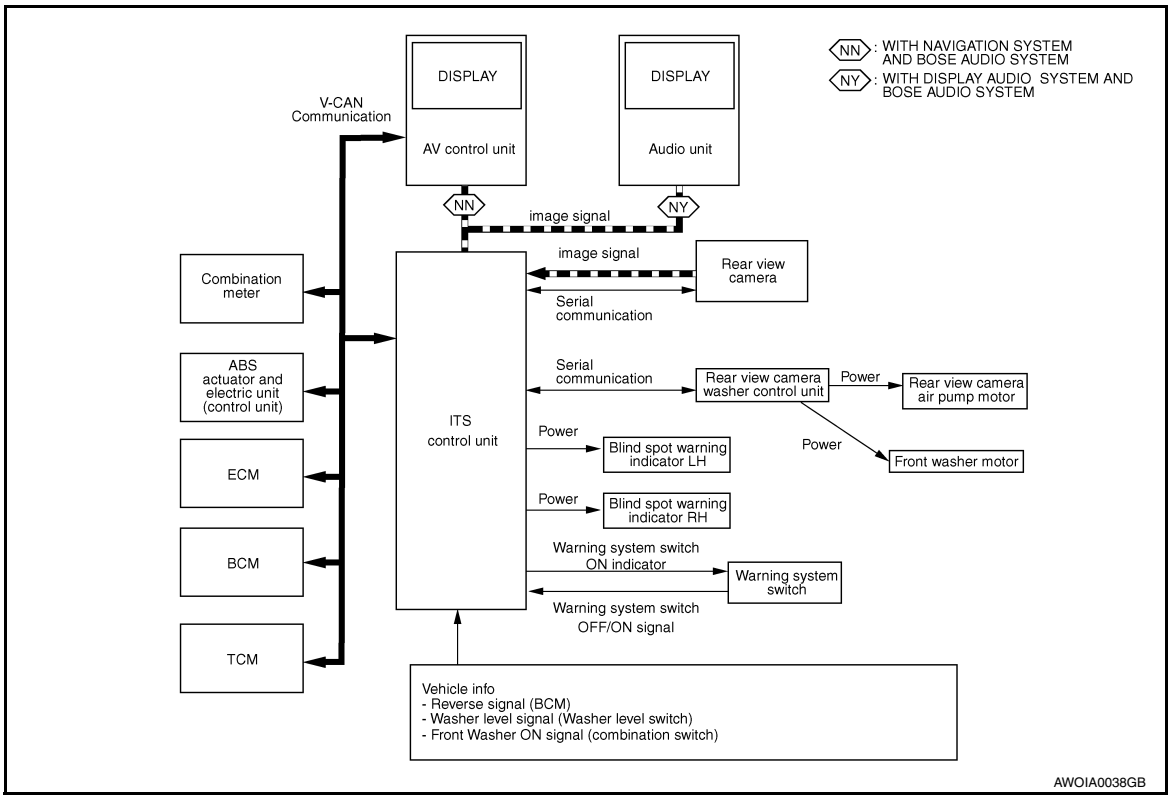
Component	Description
Rear view camera air pump motor	Drives air to the rear camera lens according to the signals received from the pump control unit
Washer fluid level switch	Transmits the washer fluid level switch signal to the ITS control unit

SYSTEM

System Description

INFOID:0000000009464890

SYSTEM DIAGRAM



ITS CONTROL UNIT INPUT/OUTPUT SIGNAL ITEM

Input Signal Item

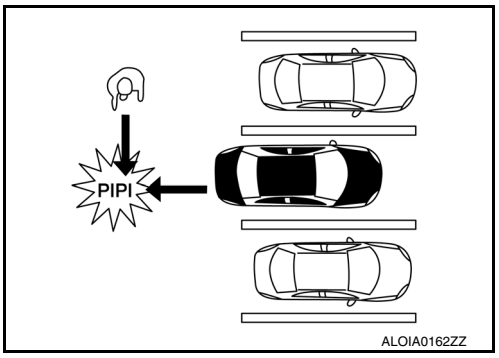
Transmit unit	Signal name		Description
ECM	CAN communication	Engine speed signal	Receives engine status
BCM	CAN communication	Door open status signal	Receives door open status
		Light status signal	Receives light status
		Turn signal	Receives turn signal status
Washer level switch	Hard wire		Washer fluid level status
ABS actuator and electric unit (control unit)	CAN communication	Wheel speed signal	Receives wheel speed
TCM	CAN communication	Shift selector position signal	Receives shift selector position
Combination meter	CAN communication	Moving Object Detection ON/OFF signal	Receives the ON/OFF status for Moving Object Detection function
Rear view camera	NTSC	Video signal	Receives the Rear View Camera image from camera for Moving Object Detection function in ITS controller

Output Signal Item

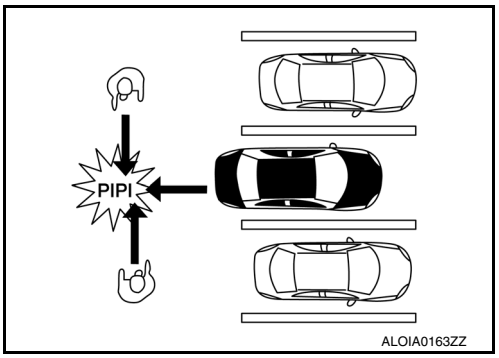
Reception unit	Signal name		Description
Combination meter	CAN communication	Buzzer Request	Transmits a buzzer request signal when a moving object is detected.
Display	CAN communication	Visual signal request	Transmits a visual signal request from the ITS controller to display Rear View while the shift selector is in R (reverse).

FUNCTION DESCRIPTION

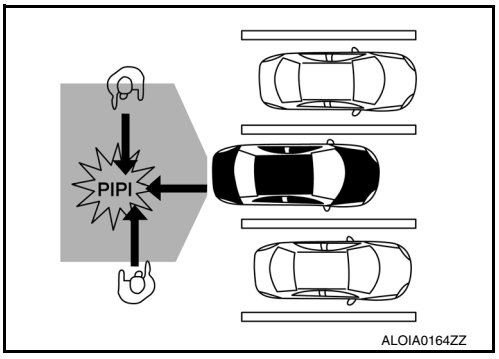
- The Moving Object Detection (MOD) system can help alert the driver of approaching vehicles or rear objects when the driver is backing out of a parking space.
- The MOD system comprises of the rear view camera as the main detection system, which is located on the trunk as illustrated.
- The MOD system operates at speeds below 8 km/h (5 MPH) whenever the vehicle is in R (reverse).



- The MOD system uses the rear view camera to detect approaching moving objects from either side.



- The MOD system can detect moving objects on either side as close as rear obstacles of up to approximately 3 m (10 feet).



MOVING OBJECT DETECTION SYSTEM OPERATION DESCRIPTION

- ITS control unit enables Moving Object Detection system.
- Combination meter turns Moving Object Detection ON indicator lamp ON/OFF according to the signals from ITS control unit via CAN communication.
- ITS control unit starts the control as follows, based on a vehicle detection signal.

Operation Condition of Moving Object Detection System

ITS control unit performs the control when the following conditions are satisfied:

- Moving Object Detection ON indicator: ON
- When the vehicle is moving in R (reverse) at 8 km/h (5 MPH) or less.

NOTE:

- When the Moving Object Detection system setting on the Vehicle Information Display is ON.

- Moving Object Detection braking will not operate or will stop operating and only a warning chime will sound under the following conditions:
- When driving with a tire that is not within normal tire conditions (pressure, wear, chain, spare, etc.)
- When the vehicle is equipped with non-original brake parts or suspension parts.
- Do not use the MOD system when towing a trailer.
- Excessive noise such as the audio system will interfere with the chime sound, and it may not be heard.

OPERATION

System Display and Warning

INFOID:0000000009464891

INDICATOR AND WARNING LAMP

The MOD system can be turned ON or OFF for the current ignition cycle using the warning system switch. When toggled between ON and OFF, the indicator will appear on the right side of the rear view camera screen.

No.	Name	Description
1	MOD indicator (blue)	• Turns ON while MOD system is ON • Under the following conditions, the MOD indicator (blue) will blink. - When the VDC system (except TCS function) or ABS operates. - When the VDC system is turned off.
	MOD warning lamp (orange)	• Turns ON when MOD system is malfunctioning • Blinks under the following conditions: - When the component temperature reaches high level. - When rear view camera blockage is detected.

DISPLAY AND WARNING OPERATION

Vehicle condition/Driver's operation				
Moving Object Detection ON indicator	Vehicle speed (Approx.) [km/h (MPH)]	Status of vehicle detection within detection area	Indication on the Moving Object Detection indicator	Buzzer
OFF	—	—	OFF	OFF
Blue	Less than approx. 8 km/h (5 MPH)	Vehicle is detected	ON	ON
	Approx. 8 km/h (5 MPH) or more	Vehicle is absent	ON	OFF
		Vehicle is detected	ON	OFF
		Vehicle is not detected	ON	OFF

HANDLING PRECAUTION

Precautions for Moving Objects Detection

INFOID:0000000009464892

REAR VIEW CAMERA HANDLING

- The rear view camera which is located on the back of the trunk performs the Moving Object Detection system.
- Always keep the rear view camera lens clean.
- Do not attach a sticker (including transparent material), install an accessory or paint work over the camera lens.
- Do not strike or scratch the lens causing physical damage to the camera or the surrounding area.

MOVING OBJECT DETECTION

- The Moving Object Detection system is not a replacement for proper driving procedure and is not designed to prevent contact with vehicles or objects. When backing up, always look in the direction driver will move to ensure it is safe to proceed. Never rely solely on the Moving Object Detection system.
- Using the Moving Object Detection system under some road or weather conditions could lead to improper system operation. Always rely on driver's own steering and braking operation to avoid accidents.
- The Moving Object Detection system may not provide a warning for vehicles that pass through the detection zone quickly.
- Do not use the Moving Object Detection system when towing a trailer.
- Excessive noise (e.g., audio system volume, open vehicle window) will interfere with the chime sound, and it may not be heard.
- The rear view camera may not be able to detect and activate Moving Object Detection when certain objects are present such as:

- Pedestrians, bicycles, animals.
- A vehicle passing at a speed greater than approximately 15 MPH (24km/h).

- Severe weather or road spray conditions may reduce the ability of the radar to detect other vehicles.
- Do not use the MOD system under the following conditions because the system may not function properly:

- When driving with a tire that is not within normal tire condition (example: tire wear, low pressure, spare tire, chain, non-standard wheels).
- When the vehicle is equipped with non-original brake parts or suspension parts.

DIAGNOSIS SYSTEM (ITS CONTROL UNIT)

CONSULT Function (AVM)

INFOID:0000000009951658

CAUTION:
After disconnecting the CONSULT vehicle interface (VI) 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 performs the following functions via CAN communication using ITS control unit.

Diagnosis mode	Description
Self Diagnostic Result	Displays the name of a malfunctioning system stored in the ITS control unit
Data Monitor	Displays ITS control unit input/output data in real time
Work support	Displays causes of automatic system cancellation occurred during system control
Active Test	Enables an operational check of a load by transmitting a driving signal from the ITS control unit to the load
ECU identification	Displays ITS control unit part number
Configuration	The vehicle specification can be written when replacing the ITS control unit

SELF DIAGNOSTIC RESULT

Refer to DAS-239, "DTC Index".

DATA MONITOR

Monitored item [Unit]	Description
ST ANGLE SENSOR SIGNAL [On/Off]	Indicates [On/Off] status as judged from ITS control unit (Angle sensor transmits angle signal through CAN communication)
REVERSE SIGNAL [On/Off]	Indicates [On/Off] status as judged from ITS control unit (TCM transmits reverse signal through CAN communication)
VEHICLE SPEED SIGNAL [On/Off]	Indicates vehicle speed calculated from ITS control unit through CAN communication [ABS actuator and electric unit (control unit) transmits vehicle speed signal (wheel speed) through CAN communication]
CAMERA SWITCH SIGNAL [On/Off]	Indicates [On/Off] status of camera switch signal as judged from ITS control unit
CAMERA OFF SIGNAL [On/Off]	Indicates [On/Off] status of camera OFF signal as judged from ITS control unit
ST ANGLE SENSOR TYPE [Absolute/Not]	Indicates whether steering angle sensor type is absolute or not (ON means "controlling")
STEERING GEAR RATIO TYPE [Type 0/1]	Indicates the type of the steering gear ratio (type 1 or 2)
STEERING POSITION [LHD/RHD]	Indicates the steering position (LHD or RHD)
REAR CAMERA IMAGE SIGNAL [OK/Not]	Indicates the status of the rear camera image as read from ITS control unit through dedicated ITS communication lines
WASH SW [ON/OFF]	Indicates the state of the wash switch indicator output
R-CAMERA COMM STATUS [OK/Not]	Indicates the status of the rear camera communication status as read from ITS control unit through dedicated ITS communication lines
R-CAMERA COMM LINE [OK/Not]	Indicates the condition of the rear camera communication line whether transmitting properly through dedicated ITS communication lines
PUMP COMM STATUS [OK/NG]	Indicates the state of the communication signal from pump control unit

Monitored item [Unit]	Description
ILL [On/Off]	Indicates [On/Off] status of the illumination signal
ITS SW 1 [On/Off]	Indicates the state of the warning system switch as seen by the ITS control unit
ITS SW 1 IND [On/Off]	Indicates the state of the warning system switch indicator output
TURN SIGNAL [Left/N/Right]	Indicates [Left/N/Right] status of the turn signal output
ITS SW 2 [ON/OFF/No setting]	Indicates the state of the warning system secondary switch as seen by the ITS control unit
ITS SW 2 IND [ON/OFF/No setting]	Indicates the state of the warning system secondary switch indicator output

WORK SUPPORT

Work support items	Description
PREDICTIVE COURSE LINE DISPLAY	Setting whether predictive guide line displays or not
INITIALIZE CAMERA IMAGE CALIBRATION	Start the initialization process of the rear camera
STEERING ANGLE SENSOR ADJUSTMENT	Execute register neutral point of steering angle sensor
CALIBRATING CAMERA IMAGE (REAR CAMERA)	Displays the various values of the rear camera during the calibration process
REAR WIDE-VIEW FIXED GUIDE LINE CORRECTION	Adjustment the position of fixed guide line on rear wide view
REAR CAMERA ITS	Displays and sets camera image calibration values
CAUSE OF LDW CANCEL	Displays the information about reason of LDW cancellation
CAUSE OF BSW CANCEL	Displays the information about reason of BSW cancellation

ACTIVE TEST

CAUTION:

- **Never perform “Active Test” while driving the vehicle.**
- **The “Active Test” cannot be performed when the following systems warning indicators are illuminated:**
  - **Lane Departure Warning indicator**
  - **Blind Spot Warning indicator**
- **Place the shift selector to P (park) position, and then perform the test.**

Test item		Description
WASH ACTIVE	ON	Activates the washer to clean the lens of rear camera
	OFF	
LED LH INDICATOR	ON	Flashes the left side LED light for ITS system
	OFF	
LED RH INDICATOR	ON	Flashes the right side LED light for ITS system
	OFF	
AIR ACTIVE	ON	Activates the air pump to clean the lens of rear camera
	OFF	
AIR & WASH ACTIVE	ON	Activates the air pump and washer to clean the lens of rear camera
	OFF	

BSW ON INDICATOR

Test item	Operation	Description	Blind Spot Warning ON indicator lamp (Yellow)
BSW ON INDICATOR	Off	Stops transmitting the Blind Spot Warning ON indicator signal below to end the test	Off
	On	Transmits the Blind Spot Warning ON indicator signal to the warning lamp on the door	ON
Washer	Off	Stops transmitting activate signal to washer below to end the test	Off
	On	Transmits activate signal to washer	ON
Air pump	Off	Stops transmitting activate signal to air pump below to end the test	Off
	On	Transmits activate signal to air pump	ON

ECU IDENTIFICATION

ITS control unit part number is displayed.

CONFIGURATION

The specifications of the vehicle can be written and read in the ITS control unit when replaced.

ECU DIAGNOSIS INFORMATION

ITS CONTROL UNIT

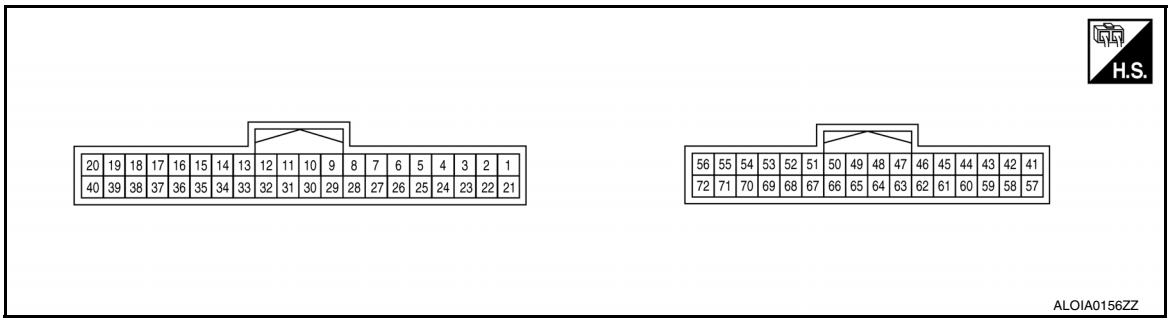
Reference Value

INFOID:0000000009951659

VALUES ON THE DIAGNOSIS TOOL

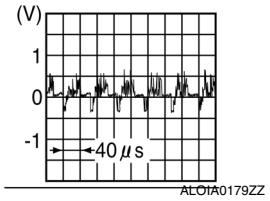
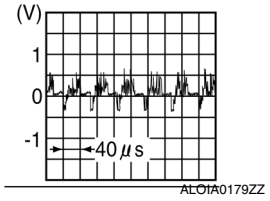
Monitor item	Condition		Value/Status
ST ANGLE SENSOR SIGNAL	Ignition switch ON	Steering angle signal is received	On
		Steering angle signal is not received	Off
REVERSE SIGNAL	Ignition switch ON	Shift selector in R (reverse)	On
		Shift selector is not in R (reverse)	Off
VEHICLE SPEED SIGNAL	While driving	Vehicle speed signal is received	On
		Vehicle speed signal is not received	Off
CAMERA SWITCH SIGNAL	Ignition switch ON	Camera switch is pressed	On
		Camera switch is not pressed	Off
CAMERA OFF SIGNAL	Ignition switch ON	Purpose switch is pressed	On
		Purpose switch is not pressed	Off
ST ANGLE SENSOR TYPE	Ignition switch ON	Steering angle sensor type is displayed	Absolute
		Steering angle sensor type is not received	Not
STEERING GEAR RATIO TYPE	Ignition switch ON	Pattern 1 type of steering gear ratio displayed	Pattern 1
		Pattern 2 type of steering gear ratio displayed	Pattern 2
STEERING POSITION	Ignition switch ON	It recognizes steering position is left	LHD
		It recognizes steering position is right	RHD
R-CAMERA COMM STATUS	Ignition switch ON	Rear camera serial status is OK	OK
		Rear camera serial status is not OK	NG
R-CAMERA COMM LINE	Ignition switch ON	Rear camera serial communication signal is received	OK
		Rear camera serial communication signal is not received	NG
ILL	Ignition switch ON	Illumination is ON	On
		Illumination is OFF	Off
ITS SW 1	Ignition switch ON	ITS switch is pressed	On
		ITS switch is not pressed	Off
ITS SW 1 IND	Ignition switch ON	Indicator of ITS switch 1 is lighting	On
		Indicator of ITS switch 1 is not lighting	Off
TURN SIGNAL	Ignition switch ON	Turn signal left is received	Left
		Turn signal neutral is received	N
		Turn signal right is received	Right
REAR CAMERA IMAGE SIGNAL	Ignition switch ON	Camera image signal is received	On
		Camera image signal is not received	Off
ITS SW 2	Ignition switch ON	For this vehicle, the displaying is fixed	No setting
ITS SW 2 IND	Ignition switch ON	For this vehicle, the displaying is fixed	No setting
WASH SW	Ignition switch ON	Wash switch signal is pressed	On
		Wash switch signal is not pressed	Off
PUMP COMM STATUS	Ignition switch ON	Pump communication signal is received	On
		Pump communication signal is not received	Off

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
1 (BR)	Ground	Washer level switch	Input	Ignition switch ON	When washer fluid is low (switch closed)	0 V
					When washer fluid is not low (switch open)	12 V
2 (G)	Ground	Washer signal pump to camera	Input	Ignition switch ON		5 V
3 (W)	Ground	Washer signal camera to pump	Output	Ignition switch ON		5 V
7 (P)	Ground	CAN -L	—	—	—	—
17 (G)	Ground	SOW LED signal R	Output	While driving	LDW/BSW detected	12 V
					LDW/BSW is not detected	0 V
20 (G)	Ground	Battery supply	Input	—	—	12 V
22 (P)	Ground	Serial ground	Output	—	—	0 V
27 (L)	Ground	CAN -H	—	—	—	—
28 (R)	Ground	Reverse	Input	Ignition switch ON	Shift selector in R (reverse)	12 V
					Shift selector not in R (reverse)	0 V
32 (P)	Ground	Cancel SW output	Input	Ignition switch ON	Cancel switch pressed	0 V
					Cancel switch not pressed	12 V
33 (BG)	Ground	LED input	Output	Ignition switch ON	Warning system is ON	12 V
					Warning system is OFF	0 V
37 (W)	Ground	SOW LED signal L	Output	While driving	LDW/BSW detected	12 V
					LDW/BSW is not detected	0 V
39 (BG)	Ground	Ignition power supply	Input	Ignition switch ON		Battery Voltage
40 (B)	Ground	Ground	—	—	—	0 V
50, 53	Ground	Shield	—	—	—	0 V
51 (R)	Ground	RR CAM GND	Output	Ignition switch ON	—	0 V

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	–	Signal name	Input/ Output		
52 (W)	Ground	RR CAM ON	Output	Ignition switch ON	6 V
66 (B)	Ground	RR CAM COMP +	Input	Ignition switch ON	
68 (G)	Ground	RR CAM CONT	Input	Ignition switch ON	5 V
69 (B)	Ground	RR CAM COMP +	Input	Ignition switch ON	

Fail-safe

INFOID:0000000009951660

If a malfunction occurs in each system, ITS control unit cancels each control, sounds a beep, and turns ON the warning lamp or indicator lamp.

System	Buzzer	Warning Indicator lamp	Description
Lane Departure Warning (LDW)	Low-pitched tone	Lane Departure Warning lamp	Cancel
Blind Spot Warning (BSW)	High-pitched tone	Blind Spot Warning lamp	Cancel
Moving Object Detection (MOD)	Low-pitched tone	Warning lamp MOD icon (on camera screen)	Cancel

DTC Inspection Priority Chart

INFOID:0000000009951661

If multiple DTCs are detected simultaneously, check them one by one depending on the following DTC inspection priority chart.

Priority	Detected items (DTC)
1	• U1000: CAN COMM CIRCUIT • U1010: CONTROL UNIT (CAN)
2	• U1305: CAMERA IMAGE CALIB • U1308: CAMERA CONFIG
3	• C1A39: STRG SEN CIR • U0428: STRG SEN CAN CIR 2 • U111A: REAR CAMERA IMAGE SIGNAL • U1232: ST ANGLE SEN CALIB • U1309: PUMP UNIT CURRENT • U130B: REAR CAMERA COMM ERROR • U1310: PUMP UNIT CIRCUIT
4	• C1A03: VHCL SPEED SE CIRC • C1A04: VDC FAIL • U0122: VDC P-RUN DIAG • U0416: VDC CHECKSUM DIAG

DTC Index

INFOID:0000000009951662

NOTE:
- The details of time display are as follows:
- CRNT: A malfunction is detected now
- PAST: A malfunction was detected in the past
- IGN counter is displayed on FFD (Freeze Frame Data).
- 0: The malfunctions that are detected now
  CAN communication system (U1000, U1010)
- 1 - 39: It increases like 0 → 1 → 2 ··· 38 → 39 after returning to the normal condition whenever the ignition switch OFF → ON. It returns to 0 when a malfunction is detected again in the process.
- If it is over 39, it is fixed to 39 until the self-diagnosis results are erased.
  Other than CAN communication system (Other than U1000, U1010)
- 1 - 49: It increases like 0 → 1 → 2 ··· 38 → 49 after returning to the normal condition whenever the ignition switch OFF → ON. It returns to 0 when a malfunction is detected again in the process.
- If it is over 49, it is fixed to 49 until the self-diagnosis results are erased.

Systems for fail-safe
- A: Lane Departure Warning (LDW)
- B: Blind Spot Warning (BSW)
- C: Moving Object Detection (MOD)

DTC		Warning lamp			Fail-safe	
CONSULT	CONSULT display	Lane Departure Warning	Blind Spot Warning	Moving Object Detection	System	Reference
C1A03	VHCL SPEED SE CIRC	ON	ON	ON	A, B, C	DAS-260
C1A04	VDC FAIL	ON	ON	ON	A, B, C	DAS-261
C1A39	STRG SEN CIR	ON	ON	ON	A, B, C	DAS-262
NO DTC IS DETECTED. FURTHER TESTING MAY BE RE-QUIRED	NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED	—	—	—	—	—
U0122	VDC P-RUN DIAG	ON	ON	ON	A, B, C	DAS-263
U0416	VDC CHECKSUM DIAG	ON	ON	ON	A, B, C	DAS-264
U0428	STRG SEN CAN CIR 2	ON	ON	ON	A, B, C	DAS-265
U1000[NOTE]	CAN COMM CIRCUIT	ON	ON	ON	A, B, C	DAS-266
U1010	CONTROL UNIT (CAN)	ON	ON	ON	A, B, C	DAS-267
U111A	REAR CAMERA IMAGE SIGNAL	ON	ON	ON	A, B, C	DAS-268
U1232	ST ANGLE SEN CALIB	ON	ON	ON	A, B, C	DAS-270
U1305	CAMERA IMAGE CALIB	ON	ON	ON	A, B, C	DAS-271
U1308	CAMERA CONFIG	ON	ON	ON	A, B, C	DAS-272
U1309	PUMP UNIT CURRENT	ON	ON	ON	A, B, C	DAS-273
U130B	REAR CAMERA COMM ERROR	ON	ON	ON	A, B, C	DAS-276
U1310	PUMP UNIT CIRCUIT	ON	ON	ON	A, B, C	DAS-277

NOTE:
With the detection of “U1000” some systems do not perform the fail-safe operation.

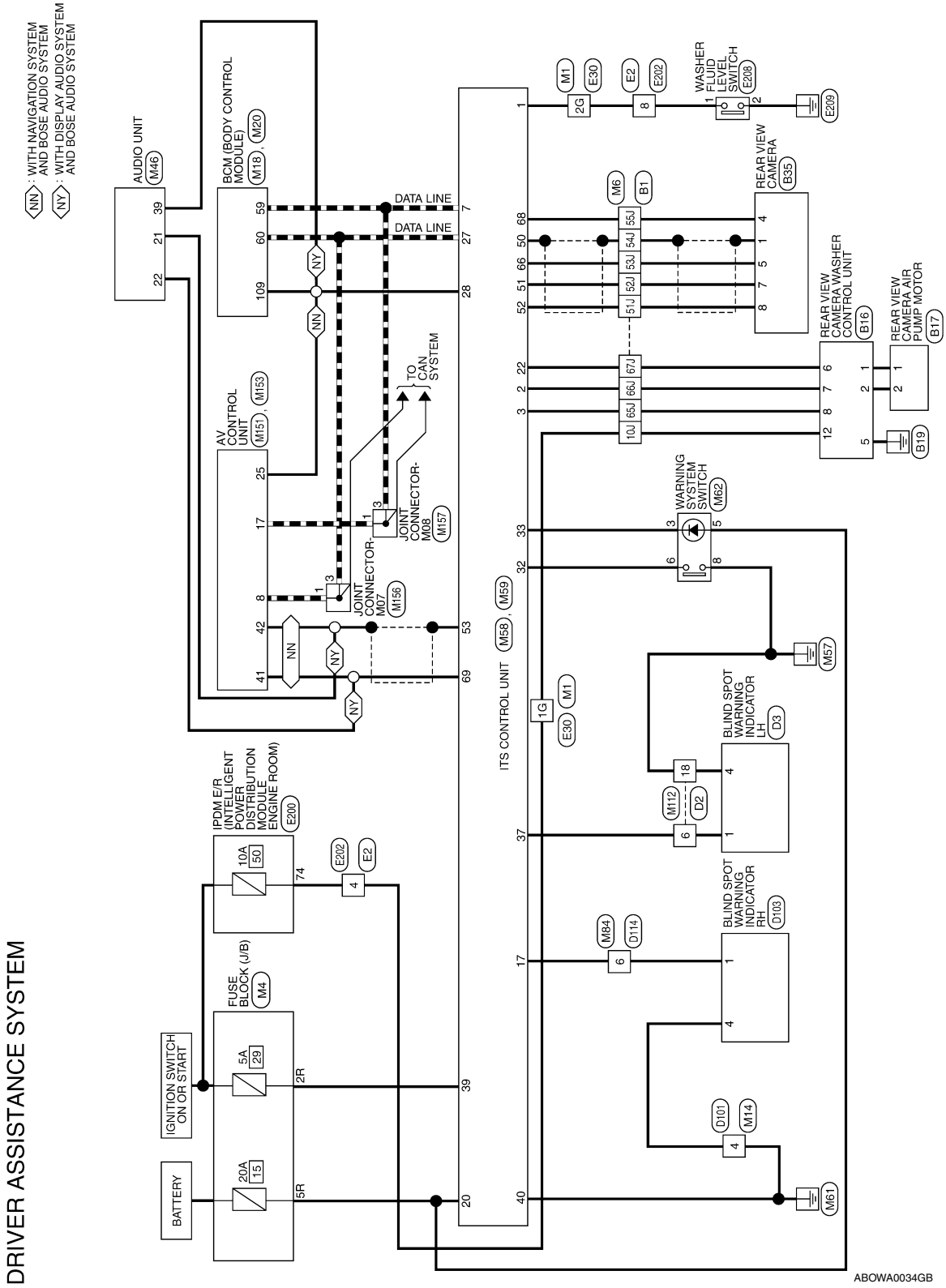
A system controlling based on a signal received from the control unit performs fail-safe operation when the communication with the ITS control unit becomes inoperable.

WIRING DIAGRAM

DRIVER ASSISTANCE SYSTEMS

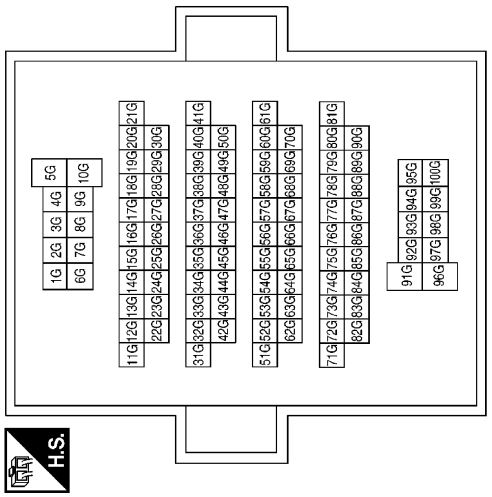
Wiring Diagram

INFOID:0000000009464898



DRIVER ASSISTANCE SYSTEM CONNECTORS

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

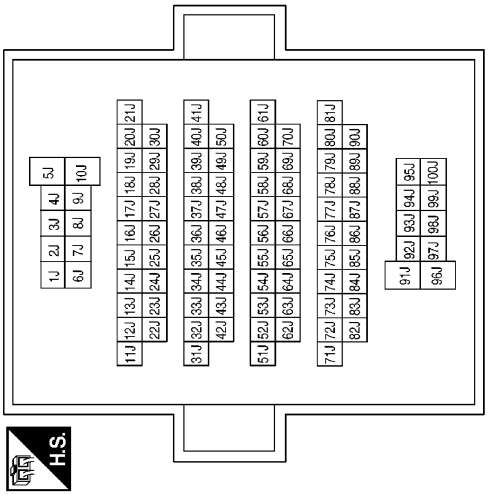


Terminal No.	Color of Wire	Signal Name
1G	LG	–
2G	BR	–

Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Color	BROWN

Terminal No.	Color of Wire	Signal Name
2R	BG	–
5R	G	–

Connector No.	M6
Connector Name	WIRE TO WIRE
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
10J	LG	–
51J	W	–
52J	R	–
53J	B	–
54J	SHIELD	–
55J	G	–
65J	W	–
66J	G	–
67J	P	–

ABOIA0115GB

Connector No.	M14
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1	2		3
4	5	6	7	8

Terminal No.	Color of Wire	Signal Name
4	GR	–

Connector No.	M18
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	BLACK

H.S.

60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41
80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64	63	62	61

Terminal No.	Color of Wire	Signal Name
59	P	CAN-L
60	L	CAN-H

Connector No.	M20
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	BLACK

H.S.

116	115	114	113	112	111	110	109	108	107	106	105
128	127	126	125	124	123	122	121	120	119	118	117

Terminal No.	Color of Wire	Signal Name
109	G	REVERSE SIGNAL

Connector No.	M46
Connector Name	AUDIO UNIT (WITH DISPLAY AUDIO SYSTEM AND BOSE AUDIO SYSTEM)
Connector Color	WHITE

H.S.

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52

Terminal No.	Color of Wire	Signal Name
21	SHIELD	COMPOSITE -
22	B	COMPOSITE +
39	G	REVERSE

ABOIA0116GB

Connector No.	M58
Connector Name	ITS CONTROL UNIT
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
1	BR	WASH LVL SW
2	G	FROM PUMP TO CAMERA C/U
3	W	FROM CAMERA C/U TO PUMP
4	–	–
5	–	–
6	–	–

Terminal No.	Color of Wire	Signal Name
7	P	CAN-L
8	–	–
9	–	–
10	–	–
11	–	–
12	–	–
13	–	–
14	–	–
15	–	–
16	–	–
17	G	SOW LED SIGNAL R
18	–	–
19	–	–
20	G	B+
21	–	–
22	P	SERIAL GND
23	–	–

Terminal No.	Color of Wire	Signal Name
24	–	–
25	–	–
26	–	–
27	L	CAN-H
28	R	REV
29	–	–
30	–	–
31	–	–
32	P	CANCEL SW OUTPUT
33	BG	LED INPUT
34	–	–
35	–	–
36	–	–
37	W	SOW LED SIGNAL L
38	–	–
39	BG	IGN
40	B	GND

Connector No.	M59
Connector Name	ITS CONTROL UNIT
Connector Color	WHITE

H.S.

56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41
72	71	70	69	68	67	66	65	64	63	62	61	60	59	58	57

Terminal No.	Color of Wire	Signal Name
41	–	–
42	–	–
43	–	–
44	–	–
45	–	–

Terminal No.	Color of Wire	Signal Name
46	–	–
47	–	–
48	–	–
49	–	–
50	SHIELD	–
51	R	RR CAM GND
52	W	RR CAM ON
53	SHIELD	–
54	–	–
55	–	–
56	–	–
57	–	–
58	–	–

Terminal No.	Color of Wire	Signal Name
59	–	–
60	–	–
61	–	–
62	–	–
63	–	–
64	–	–
65	–	–
66	B	RR CAM COMP +
67	–	–
68	G	RR CAM CONT
69	B	COMP OUT +
70	–	–
71	–	–
72	–	–

AAOIA0042GB

Connector No.	M112
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	17	18	19	20	21	22	23	24

Terminal No.	Color of Wire	Signal Name
6	W	–
18	B	–

Connector No.	M84
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	17	18	19	20	21	22	23	24

Terminal No.	Color of Wire	Signal Name
6	G	–

Connector No.	M62
Connector Name	WARNING SYSTEM SWITCH
Connector Color	GRAY

H.S.

4	3	2	1
8	7	6	5

Terminal No.	Color of Wire	Signal Name
3	BG	–
5	G	–
6	P	–
8	B	–

Connector No.	M156
Connector Name	JOINT CONNECTOR-M07
Connector Color	WHITE

H.S.

4	3	2	1

Terminal No.	Color of Wire	Signal Name
1	L	–
3	L	–

Connector No.	M153
Connector Name	AV CONTROL UNIT (WITH NAVIGATION SYSTEM WITH BOSE AUDIO SYSTEM)
Connector Color	WHITE

H.S.

21	22	23	24	25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40	41	42	43	44

Terminal No.	Color of Wire	Signal Name
25	G	REVERSE
41	B	CAMERA +
42	SHIELD	CAMERA - (SHIELD)

Connector No.	M151
Connector Name	AV CONTROL UNIT (WITH NAVIGATION SYSTEM WITH BOSE AUDIO SYSTEM)
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
8	L	CAN-H
17	P	CAN-L

ABOIA0117GB

Connector No.	M157
Connector Name	JOINT CONNECTOR-M08
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	P	–
3	P	–

Connector No.	E2
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
4	BG	– (WITH REAR VIEW CAMERA)
8	R	–

Connector No.	E30
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1G	BG	– (WITH REAR VIEW CAMERA)
2G	R	–

Connector No.	E200
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
74	BG	WASH MTR (WITH REAR VIEW CAMERA)

ABOIA0118GB

Connector No.	E202
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

3		2	1
8	7	6	5	4

Terminal No.	Color of Wire	Signal Name
4	BG	– (WITH REAR VIEW CAMERA)
8	R	–

Connector No.	E208
Connector Name	WASHER FLUID LEVEL SWITCH
Connector Color	BLACK

H.S.

1	2

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

Connector No.	B1
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
10J	W	–
51J	W	–
52J	B	–
53J	R	–
54J	SHIELD	–
55J	G	–
65J	W	–
66J	G	–
67J	P	–

Connector No.	B16
Connector Name	REAR VIEW CAMERA WASHER CONTROL UNIT
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
1	V	PUMP MOTOR +
2	BR	PUMP MOTOR -
5	B	GND
6	P	SERIAL GND
7	G	FROM PUMP TO CAMERA C/U
8	W	FROM CAMERA C/U TO PUMP
12	W	IGN

ABOIA0119GB

Connector No.	B17
Connector Name	REAR VIEW CAMERA AIR PUMP MOTOR
Connector Color	WHITE

H.S.

1	2

Terminal No.	Color of Wire	Signal Name
1	V	–
2	BR	–

Connector No.	B35
Connector Name	REAR VIEW CAMERA
Connector Color	WHITE

H.S.

4	3	2	1
8	7	6	5

Terminal No.	Color of Wire	Signal Name
1	SHIELD	–
4	G	–
5	R	–
7	B	–
8	W	–

Connector No.	D2
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
6	P	–
18	B	–

Connector No.	D3
Connector Name	BLIND SPOT WARNING INDICATOR LH
Connector Color	WHITE

H.S.

4	3	2	1

Terminal No.	Color of Wire	Signal Name
1	P	–
4	B	–

Connector No.	D101
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

3		2	1
8	7	6	5	4

Terminal No.	Color of Wire	Signal Name
4	B	–

Connector No.	D103
Connector Name	BLIND SPOT WARNING INDICATOR RH
Connector Color	WHITE

H.S.

4	3	2	1

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

ABOIA0120GB

Connector No.	D114
Connector Name	WIRE TO WIRE
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
6	R	–

ABOIA0121GB

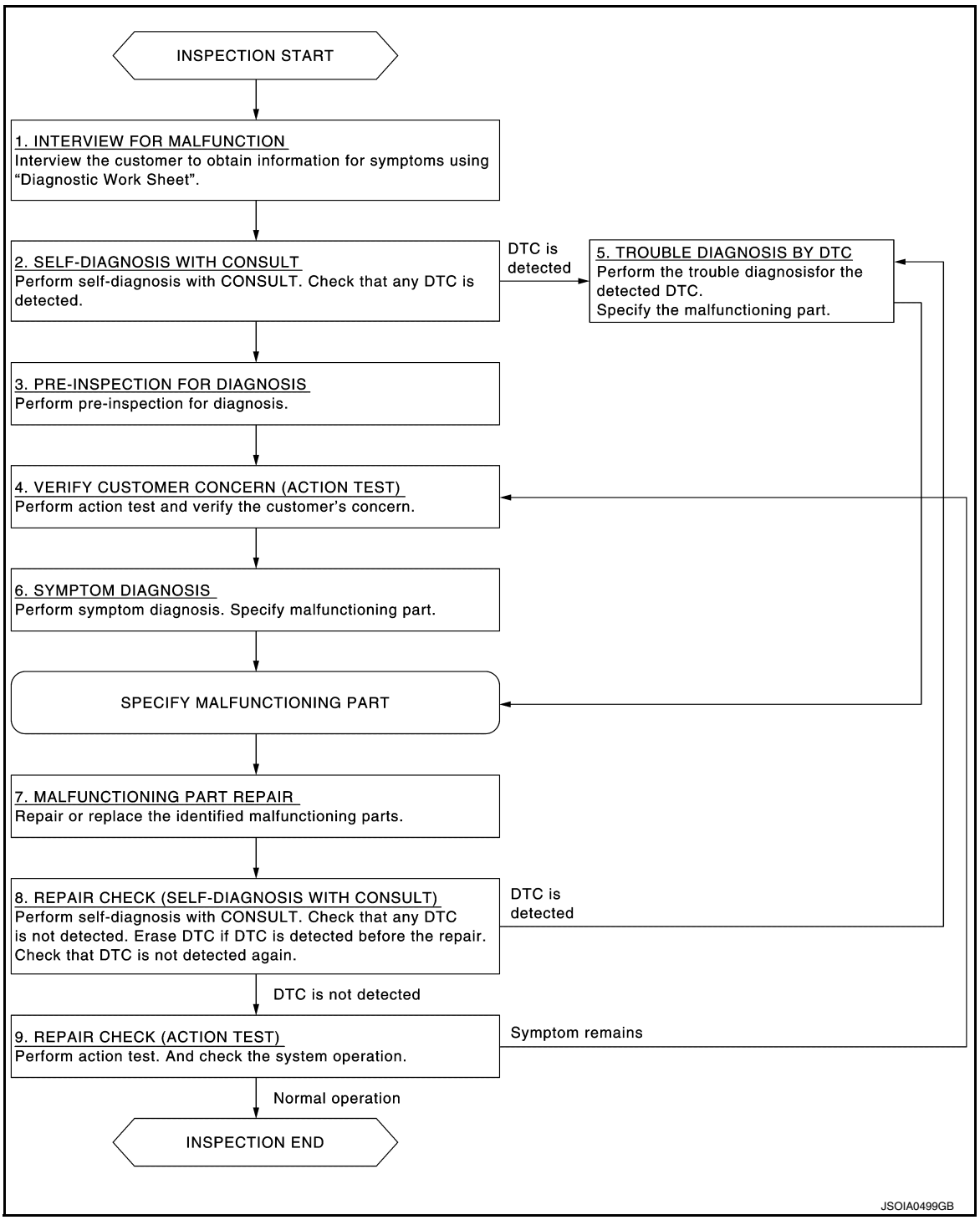
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000009464899

OVERALL SEQUENCE



DETAILED FLOW

1.INTERVIEW FOR MALFUNCTION

Interview the customer to obtain information about symptoms using “Diagnostic Work Sheet”. (Refer to DAS-251, "Diagnostic Work Sheet".)

>> GO TO 2.

2.SELF-DIAGNOSIS WITH CONSULT

1. Perform “All DTC Reading” with CONSULT.
2. Check if the DTC is detected on the self-diagnosis results of “AVM”.

Is any DTC detected?

YES >> GO TO 5.
NO >> GO TO 3.

3.PRE-INSPECTION FOR DIAGNOSIS

Perform pre-inspection for diagnosis. Refer to DAS-253, "Inspection Procedure".

>> GO TO 4.

4.ACTION TEST

Perform MOD system action test to check the operation status. Refer to DAS-254, "Description".

>> GO TO 6.

5.TROUBLE DIAGNOSIS BY DTC

Perform trouble diagnosis for the detected DTC. Specify a malfunctioning part. Refer to DAS-239, "DTC Index" (ITS CONTROL UNIT).

>> GO TO 7.

6.SYMPTOM DIAGNOSIS

Perform symptom diagnosis. Specify malfunctioning part. Refer to DAS-286, "Symptom Table".

>> GO TO 7.

7.MALFUNCTION PART REPAIR

Repair or replace the identified malfunctioning parts.

>> GO TO 8.

8.REPAIR CHECK (SELF-DIAGNOSIS WITH CONSULT)

Perform self-diagnosis with CONSULT. Check that any DTC is not detected. Erase DTC if DTC is detected before the repair. Check that DTC is not detected again.

Is any DTC detected?

YES >> GO TO 5.
NO >> GO TO 9.

9.REPAIR CHECK (ACTION TEST)

Perform MOD system action test. Also check the system operation.

Does it operate normally?

YES >> Inspection End.
NO >> GO TO 4.

Diagnostic Work Sheet

INFOID:0000000009464900

DESCRIPTION

In general, each customer feels differently about an incident. It is important to fully understand the symptoms or conditions for a customer complaint.
There are many operating conditions that lead to the malfunction. A good grasp of such conditions can make troubleshooting faster and more accurate.
Some conditions may cause the lane departure warning lamp to stay ON.

Utilize a work sheet sample to organize all of the information for troubleshooting.

KEY POINTS
- WHAT..... System and functions
- WHEN..... Date, Frequencies
- WHERE..... Road conditions
- HOW..... Operating conditions, Symptoms

WORK SHEET SAMPLE

Customer name MR/MS	Model and Year	VIN
Engine #	Trans.	Mileage
Incident Date	Manuf. Date	In Service Date

Symptoms			
Indicator/Warning lamps	☐ Lane departure warning lamp	☐ Stays ON ☐ Stays OFF ☐ Blinks ☐ Turned ON occasionally ☐ Others ( )	
	☐ Warning systems ON indicator	☐ Stays ON ☐ Stays OFF ☐ Blinks ☐ Others ( )	
	☐ Other lamps ( )	☐ Stays ON ☐ Stays OFF ☐ Blinks ☐ Turned ON occasionally ☐ Others ( )	
Functions	☐ When using MOD		
	☐ All functions do not operate. ☐ Warning function does not operate. (☐ No sound ☐ No indicator) ☐ Yawing function does not operate. (Warning function is operated.) ☐ Functions when changing the course in the turn signal direction. ☐ Functions are untimely. ☐ Does not function when driving on lane markers. ☐ Functions when driving in a lane. ☐ Functions in a different position from the actual position. ☐ Others ( )		

Conditions			
Frequency	☐ Continuously	☐ Intermittently	
Light conditions	☐ Not affected ☐ In the daytime ☐ Direct light	☐ At night ☐ Backlight	☐ Sunrise/sunset (Strong light) ☐ Others ( )
Driving conditions	☐ Not affected ☐ Vehicle speed	MPH (km/h)	☐ Vehicle is stopped
Weather conditions	☐ Not affected ☐ Fine ☐ Clouding	☐ Raining	☐ Snowing ☐ Others ( )
Road conditions	☐ Not affected ☐ Highway ☐ Uneven roads	☐ In town ☐ Winding roads	☐ Others ( )
Lane maker conditions	☐ Not affected ☐ Clear	☐ Unclear	☐ Others ( )
Other conditions			

ALOIA0194GB

PRE-INSPECTION FOR DIAGNOSIS

Inspection Procedure

INFOID:0000000009464901

1.CHECK CAMERA LENS

Is camera lens contaminated with foreign materials?

YES >> Clean camera lens.
NO >> GO TO 2.

2.CHECK REAR VIEW CAMERA UNIT INSTALLATION CONDITION

Check rear view camera unit installation condition (installation position, properly fitted).

Is it properly installed?

YES >> GO TO 3.
NO >> Install rear view camera unit properly, and perform rear view camera calibration. Refer to DAS-256, "Description".

3.CHECK VEHICLE HEIGHT

Check vehicle height. Refer to FSU-26, "Wheelarch Height (Unladen*1)".

Is vehicle height appropriate?

YES >> Inspection End.
NO >> Repair vehicle to appropriate height.

ACTION TEST

Description

INFOID:0000000009464902

- Perform action test to verify the customer's concern.
- Perform action test and check the system operation after system diagnosis.

WARNING:
Be careful of traffic conditions and safety around the vehicle when performing road test.
CAUTION:
• Fully understand the following items well before the road test;
- Precautions: Refer to DAS-73, "Precaution for LDW System Service".
- System description for LDW: Refer to DAS-77, "System Description".
- System description for BSW: Refer to DAS-152, "System Description".
- System description for MOD: Refer to DAS-228, "System Description".
- Handling precaution: Refer to DAS-82, "Precautions for Lane Departure Warning".

Inspection Procedure

INFOID:0000000009464903

WARNING:
Be careful of traffic conditions and safety around the vehicle when performing road test.
CAUTION:
• Fully understand the following items well before the road test;
- Precautions: Refer to DAS-73, "Precaution for LDW System Service".
- System description for LDW: Refer to DAS-77, "System Description".
- System description for BSW: Refer to DAS-152, "System Description".
- System description for MOD: Refer to DAS-228, "System Description".
- Handling precaution: Refer to DAS-232, "Precautions for Moving Objects Detection".

1.CHECK MOD SYSTEM SETTING

1. Start the engine.
2. Check that the MOD system setting can be enabled/disabled on the vehicle information display.
3. Turn OFF the ignition switch and wait for 30 seconds or more.
4. Check that the previous setting is saved when the engine starts again.

>> GO TO 2.

2.ACTION TEST FOR MOD

1. Enable the setting of the MOD system on the vehicle information display.
2. Turn warning systems switch ON (warning systems ON indicator is ON).
3. Check the MOD operation according to the following table.

Vehicle condition/ Driver's operation			Vehicle response	
Moving Object Detection ON indicator	Vehicle speed (Approx.) [km/h (MPH)]	Status of vehicle detection within detection area	Indication on the Moving Object Detection indicator	Buzzer
OFF	—	—	OFF	OFF
Blue	Less than approx. 8 km/h (5 MPH)	Vehicle is detected	ON	ON
	Approx. 8 km/h (5 MPH) or more	Vehicle is absent	ON	OFF
		Vehicle is detected	ON	OFF
		Vehicle is not detected	ON	OFF

NOTE:
After the operating conditions of warning are satisfied, the warning continues until the vehicle reaches a higher speed. Refer to DAS-228, "System Description".

>> Inspection End.

ADDITIONAL SERVICE WHEN REPLACING REAR VIEW CAMERA

Description

INFOID:0000000009464904

Always perform the calibration after removing and installing or replacing the rear view camera.

CAUTION:

The system does not operate normally unless the rear view camera aiming adjustment is performed. Always perform it.

Work Procedure

INFOID:0000000009464905

1.CAMERA AIMING ADJUSTMENT

Perform the camera aiming adjustment with CONSULT. Refer to DAS-256, "Description".

>> GO TO 2.

2.PERFORM SELF-DIAGNOSIS

Perform the self-diagnosis of rear view camera with CONSULT. Check if any DTC is detected.

Is any DTC detected?

YES >> Perform the trouble diagnosis for the detected DTC. Refer to DAS-239, "DTC Index".
NO >> GO TO 3.

3.LDW/BSW SYSTEM ACTION TEST

1. Perform the LDW/BSW system action test. Refer to DAS-254, "Description".
2. Check that the LDW/BSW system operates normally.

Is the inspection result normal?

YES >> Inspection End.
NO >> GO TO 4.

4.LDW/BSW ACTIVE TEST

1. Perform WASH ACTIVE on Active Test using CONSULT.
2. Perform air and washer tube connection check by AIR & WASH ACTIVE on Active Test:

(1) Washer fluid output count on the rear view camera is 3 to 5 times → OK
(2) Washer fluid output count on the rear view camera is 10 times → Check tube with yellow marking
(3) Washer fluid output count on the rear view camera is 1 time → Check tube with green marking
(4) No washer fluid output → Check tube with blue marking or check valve

>> Inspection End.

REAR VIEW CAMERA CALIBRATION

Description

INFOID:0000000009464906

Always perform the calibration after removing and installing or replacing the rear view camera.

CAUTION:

- **Place the vehicle on level ground when the calibration is performed.**
- **Follow the CONSULT when performing the calibration. (Rear view camera calibration cannot be operated without CONSULT).**

Work Procedure (Preparation)

INFOID:0000000009464907

1.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis of the ITS control unit.

Is any DTC detected?

Except "U1308">> Perform diagnosis on the detected DTC and repair or replace the applicable item. Refer to DAS-239, "DTC Index".

"U1308" or no DTC>>GO TO 2.

2.PREPARATION BEFORE REAR VIEW CAMERA CALIBRATION

NOTE:

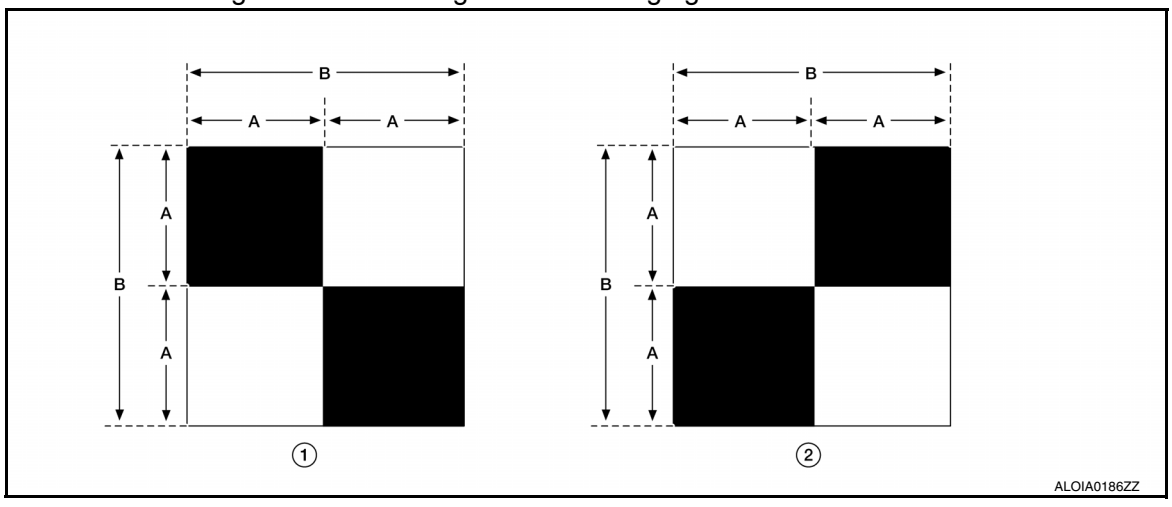
Select the "AVM" to diagnose the ITS control unit by CONSULT.

1. Perform pre-inspection for diagnosis. Refer to DAS-253, "Inspection Procedure".
2. Adjust the tire pressure to the specified pressure value.
3. Maintain no-load in vehicle.
4. Check if coolant and engine oil are filled up to correct level and fuel tank is full.
5. Situate vehicle where the camera is exposed at an atmosphere temperature between 0°C (32°F) and 30°C (86°F)
6. Move the shift selector to P (Park) and release the parking brake.
7. Clean the rear view camera.

>> GO TO 3.

3.PREPARATION OF CALIBRATION TARGET MARK

Prepare the calibration target mark according to the following figure:



(1) : Left and right targets

(2) : Center target

(A) : Side of the black or white area = 200 mm (7.87 in)

(B) : Side of the square target = 400 mm (15.75 in)

>> Refer to DAS-257, "Work Procedure (Target Setting)".

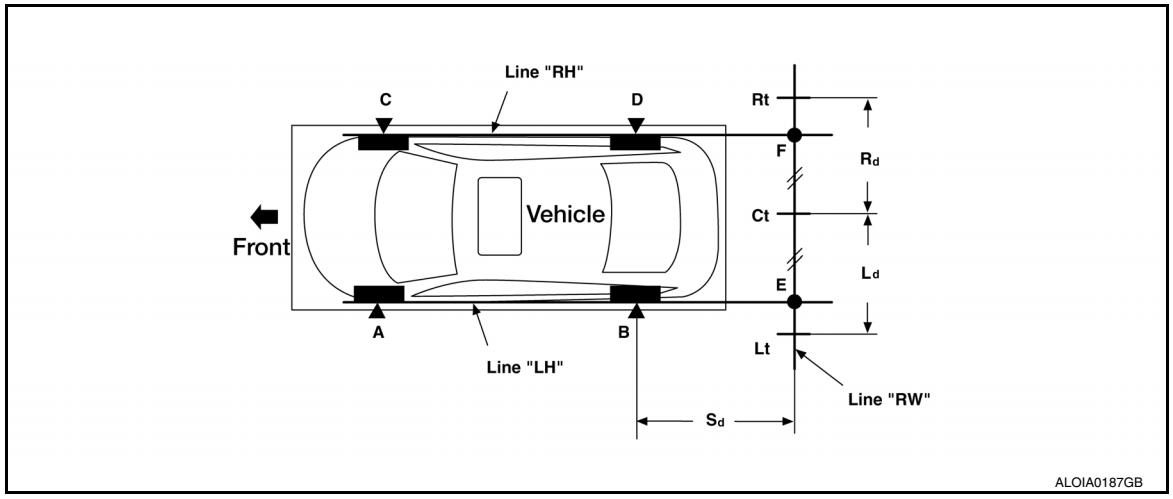
Work Procedure (Target Setting)

INFOID:0000000009464908

CAUTION:

- **Perform this operation in a horizontal position where there is a clear view for 3 m (9.84 ft) backward and 4 m (13.12 ft) wide.**
- **Place the target in a well-lighted location. (Poor lighting may make it hard to adjust.)**
- **The target may not be detected when it shines by the reflected light of the sun or lighting.**
- **The target may not be detected when there is the same pattern of black and white as the target when the pattern is within 0.5 m (1.64 ft) from either side and upward/downward position from the target. (It is desirable that the vehicle is positioned on a single-color floor.)**

1. TARGET SETTING

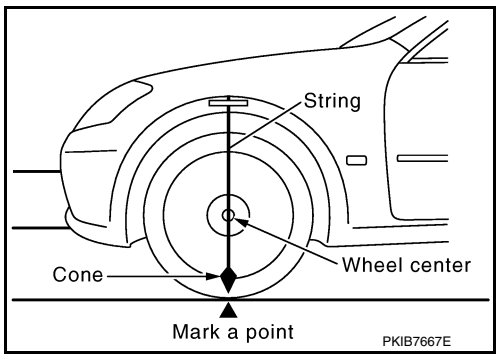


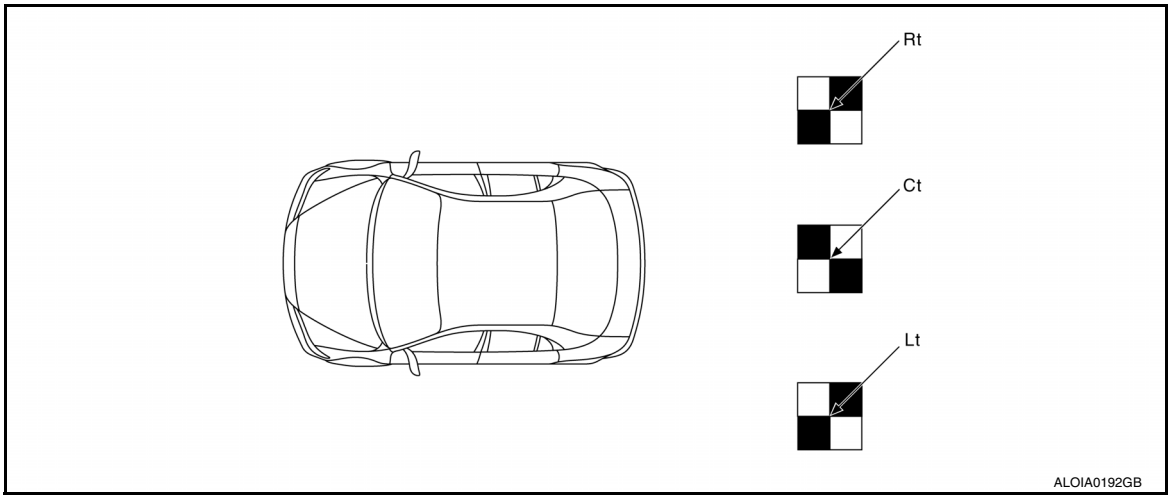
Side distance (S_d): "B" – "E" ("D" – "F") : 2125 mm (83.66 in)

Left distance (L_d): "Ct" – "Lt" : 1500 mm (59.06 in)

Right distance (R_d): "Ct" – "Rt" : 1500 mm (59.06 in)

1. Mark points "A", "B", "C" and "D" at the center of the lateral surface of each wheel.
   NOTE:
   Hang a string with a cone from the fender so as to pass through the center of wheel, and then mark a point at the center of the lateral surface of the wheel.
2. Draw line "LH" passing through points "A" and "B" on the left side of vehicle.
   NOTE:
   Approximately 2.2 m (7.22 ft) or more at the rear from the rear axle.
3. Mark point "E" on the line "LH" at the positions 2125 mm (83.66 in) from point "B".
4. Draw line "RH" passing through points "C" and "D" on the right side of vehicle in the same way as step 2.
5. Mark point "F" on the line "RH" at the positions 2125 mm (83.66 in) from point "D".
6. Draw line "RW" passing through the points "E" and "F" on the rear of the vehicle.
   NOTE:
   Approximately 1.8 m (5.91 ft) or more at both left and right sides from vehicle center.
7. Mark point "Ct" at the center of point "E" and "F" on the line "RW".
   CAUTION:
   Make sure that "E" to "Ct" is equal to "F" to "Ct".
8. Mark point "Lt" and "Rt" on the line "RW" at the positions 1500 mm (59.06 in) from point "Ct".
9. Position the center of the target mark to point of "Ct".





CAUTION:
Make sure that the black/white pattern of the center target is rotated as compared with the left and right targets.

>> Go to DAS-258, "Work Procedure (Rear View Camera Calibration)".

Work Procedure (Rear View Camera Calibration)

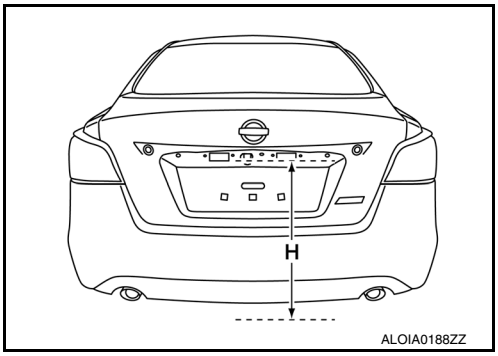
INFOID:0000000009464909

CAUTION:
Perform the calibration under the specified vehicle condition (fuel full, no-load, specified tire pressure, etc.). Refer to DAS-256, "Work Procedure (Preparation)".

1.CHECK REAR VIEW CAMERA HEIGHT

Measure the rear view camera height “H”.

>> GO TO 2.



2.REAR VIEW CAMERA CALIBRATION

1. Select “Work Support” on “AVM” with CONSULT.
2. Select “REAR CAMERA ITS”.
3. Select "OK".
   CAUTION:
   - **Perform the calibration after the ignition or engine has been kept on for at least 10 minutes to stabilize camera.**
   - **Operate CONSULT outside the vehicle, and close all doors to retain appropriate vehicle altitude.**
4. Input the rear view camera height "H", and then touch "APPLY".
5. Confirm that the same value is displayed on the center display.
6. Confirm the following items:

- The target should be accurately placed.
- The vehicle should be stopped.
- The vehicle should be under the specified vehicle condition.

7. Select “Start” to perform calibration.
8. Confirm the displayed item.

- “Completed”: Select “Completion”.
- Otherwise, perform the following services:

Displayed item		Possible cause	Service procedure
SUSPENSION	—	Temporary malfunction in internal processing of the rear view camera.	Go back to Step 1
	00H Routine not activated	Rear view camera unit malfunction.	Position the target appropriately again. Perform the aiming again. Refer to DAS-257, "Work Procedure (Target Setting)".
	10H Writing error	• Temporary malfunction in internal processing of the rear view camera. • Rear view camera malfunction.	
X AIMING NG Y (X: 0 - 7, Y: 1 - 8)	—	• A target is not-yet-placed. (The rear view camera cannot detect a target.) • The position of the rear view camera is not correct. • Inappropriate work environment. • Inappropriate vehicle condition.	Position the target appropriately again. Perform the aiming again. Refer to DAS-256, "Work Procedure (Preparation)".
ABNORMALLY COMPLETED	—		

NOTE:
Replace camera unit if “00H Routine not activated” or “10H Writing error” are repeatedly indicated during the above two services are performed.

9. Confirm that “Completed” is displayed and then select “End” to close the calibration procedure.

>> GO TO 3.

3. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis of ITS control unit with CONSULT.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the applicable item. Refer to DAS-239, "DTC Index".

NO >> GO TO 4.

4. ACTION TEST

Test the system operation by action test. Refer to DAS-254, "Description".

>> Work End.

DTC/CIRCUIT DIAGNOSIS

C1A03 VEHICLE SPEED SENSOR

DTC Logic

INFOID:0000000009464910

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
C1A03	VHCL SPEED SEN CIRC	ITS control unit detects that the result of calculation about velocity has error.	• ABS actuator and electric unit (control unit) • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the "C1A03" is detected as the current malfunction in "Self Diagnostic Result" of "AVM".

Is “C1A03” detected as the current malfunction?

YES >> Refer to DAS-260, "Diagnosis Procedure".
NO >> Refer to GI-43, "Intermittent Incident".

Diagnosis Procedure

INFOID:0000000009464911

1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts. Refer to BRC-45, "DTC Index".
NO >> GO TO 2.

2.CHECK ALL UNIT SELF-DIANOSIS RESULTS

Check if any DTC is detected except for ITS control unit about VDC in "ALL DTC READING" with CONSULT.

Is any DTC detected except for ITS?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-128, "Removal and Installation".
NO >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".

C1A04 ABS/TCS/VDC SYSTEM

DTC Logic

INFOID:0000000009464912

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
C1A04	VDC CIRCUIT	ITS control unit receives the message that means "VDC is failed" from ABS actuator and electric unit (control unit).	• ABS actuator and electric unit (control unit) • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the "C1A04" is detected as the current malfunction in "Self Diagnostic Result" of "AVM".

Is “C1A04” detected as the current malfunction?

YES >> Refer to DAS-261, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000009464913

1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts. Refer to BRC-45, "DTC Index".
NO >> GO TO 2.

2.CHECK ALL UNIT SELF-DIANOSIS RESULTS

Check if any DTC is detected except for ITS control unit about VDC in "ALL DTC READING" with CONSULT.

Is any DTC detected?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-128, "Removal and Installation".
NO >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".

C1A39 STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000009464914

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
C1A39	STRG SEN CIR	ITS control unit receives the message that means "Steering angle sensor is failed" from steering angle sensor.	• Steering angle sensor • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the "C1A39" is detected as the current malfunction in "Self Diagnostic Result" of "AVM".

Is “C1A39” detected as the current malfunction?

YES >> Refer to DAS-262, "Diagnosis Procedure".
NO >> Refer to GI-43, "Intermittent Incident".

Diagnosis Procedure

INFOID:0000000009464915

1.CHECK STRG SENSOR SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts. Refer to BRC-45, "DTC Index".
NO >> GO TO 2.

2.CHECK ALL UNIT SELF-DIANOSIS RESULTS

Check if any DTC is detected except for ITS control unit about ABS in "ALL DTC READING" with CONSULT.

Is any DTC detected except for ITS?

YES >> Replace steering angle sensor. Refer to BRC-132, "Removal and Installation".
NO >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".

U0122 VDC P-RUN DIAG

DTC Logic

INFOID:0000000009464916

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U0122	VDC P-RUN DIAG	ITS control unit receives the incorrect signal about P-RUN from VDC via V-CAN communication	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U0122” is detected as the current malfunction in self-diagnosis results of “AVM”.

Is “U0122” detected as the current malfunction?

YES >> Refer to DAS-263, "Diagnosis Procedure".
NO >> Refer to GI-43, "Intermittent Incident".

Diagnosis Procedure

INFOID:0000000009464917

1.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts.
NO >> GO TO 2.

2.CHECK ITS CONTROL UNIT SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts.
NO >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-128, "Removal and Installation".

U0416 VDC CHECKSUM DIAG

DTC Logic

INFOID:0000000009464918

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U0416	VDC CHECKSUM DIAG	ITS control unit receives the incorrect signal about P-RUN from VDC via V-CAN communication	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U0416” is detected as the current malfunction in self-diagnosis results of “AVM”.

Is “U0416” detected as the current malfunction?

YES >> Refer to DAS-264, "Diagnosis Procedure".
NO >> Refer to GI-43, "Intermittent Incident".

Diagnosis Procedure

INFOID:0000000009464919

1.CHECK VDC UNIT SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts.
NO >> GO TO 2.

2.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SELF-DIAGNOSIS RESULTS

Check if any DTC is detected in “Self Diagnostic Result” of “ABS”.

Is any DTC detected?

YES >> Perform diagnosis on the detected DTC and repair or replace the malfunctioning parts.
NO >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-128, "Removal and Installation".

U0428 STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000009464920

DTC	Display contents of CONSULT	DTC detection condition	Possible malfunction factor
U0428	ST ANGLE SENSOR CALIBRATION [U0428]	The neutral position adjustment of the steering angle sensor is incomplete.	Adjust neutral position of the steering angle sensor.

Diagnosis Procedure

INFOID:0000000009464921

1.ADJUST THE NEUTRAL POSITION OF THE STEERING ANGLE SENSOR

When U1232 is detected, adjust the neutral position of the steering angle sensor.

>> Perform adjustment of the neutral position of the steering angle sensor. Refer to BRC-33, "CONSULT Function (ABS)".

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000009464922

CAN COMMUNICATION

CAN (Controller Area Network) is a serial communication line for real time applications. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Modern vehicle is equipped with many electronic control units, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H, CAN-L) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads the required data only.
CAN communication signal chart. Refer to LAN-32, "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart".

ITS COMMUNICATION

- ITS communication is a multiplex communication system. This enables the system to transmit and receive large quantities of data at high speed by connecting control units with 2 communication lines.
- ITS communication lines adopt twisted-pair line style (two lines twisted) for noise immunity.

DTC Logic

INFOID:0000000009464923

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1000	CAN COMM CIRCUIT	If ITS control unit is not transmitting or receiving CAN communication signal or ITS communication signal for 2 seconds or more	• CAN communication system • ITS communication system

NOTE:
If “U1000” is detected, first diagnose the CAN communication system.

Diagnosis Procedure

INFOID:0000000009464924

1.PERFORM THE SELF-DIAGNOSIS

1. Turn the ignition switch ON.
2. Turn the MAIN switch of ITS system ON, and then wait for 30 seconds or more.
3. Perform “All DTC Reading” with CONSULT.
4. Check if the “U1000” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U1000” detected as the current malfunction?

YES >> Refer to DAS-266, "Description".
NO >> Refer to GI-43, "Intermittent Incident".

U1010 CONTROL UNIT (CAN)

Description

INFOID:0000000009464925

CAN controller controls the communication of CAN communication signal and ITS communication signal, and the error detection.

DTC Logic

INFOID:0000000009464926

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1010	CONTROL UNIT (CAN)	If ITS control unit detects malfunction by CAN controller initial diagnosis	ITS control unit

Diagnosis Procedure

INFOID:0000000009464927

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn the MAIN switch of ITS system ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U1010” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U1010” detected as the current malfunction?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Inspection End.

U111A REAR CAMERA IMAGE SIGNAL CIRCUIT

DTC Logic

INFOID:0000000009464928

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U111A	REAR CAMERA IMAGE SIGNAL	Rear camera image signal circuit is open or shorted	Check rear camera image signal circuit between rear camera and around view monitor control unit.

Diagnosis Procedure

INFOID:0000000009464929

Regarding Wiring Diagram information, refer to DAS-241, "Wiring Diagram".

1.CHECK CONTINUITY REAR CAMERA POWER SUPPLY AND GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect the ITS control unit connector and rear camera connector.
3. Check for continuity between ITS control unit harness connector and rear camera harness connector.

ITS control unit		Rear Camera		Continuity
Connector	Terminal	Connector	Terminal	
M59	51	B35	7	Yes
	52		8	

4. Check for continuity between ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M59	52		No

Is the inspection result normal?

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

2.CHECK VOLTAGE REAR CAMERA POWER SUPPLY

1. Connect the ITS control unit connector and rear camera connector.
2. Turn the ignition switch ON.
3. Check voltage between ITS control unit harness connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
ITS control unit				
Connector	Terminal			
M59	52	Ground	"CAMERA" switch is ON or shift selector is in R (Reverse)	6.2 V

Is inspection result normal?

YES >> GO TO 3.
NO >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".

3. CHECK CONTINUITY REAR CAMERA IMAGE SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect the ITS control unit connector and rear camera connector.
3. Check for continuity between ITS control unit harness connector and rear camera harness connector.

ITS control unit		Rear View Camera		Continuity
Connector	Terminal	Connector	Terminal	
M59	50	B35	1	Yes
	66		5	

4. Check for continuity between ITS control unit harness connector and ground.

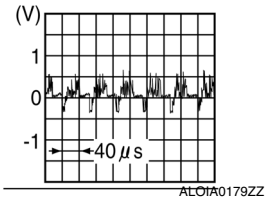
ITS control unit		Ground	Continuity
Connector	Terminal		
M59	50		No
	66		

Is inspection result normal?

YES >> GO TO 4.
NO >> Repair harness or connector.

4. CHECK REAR CAMERA IMAGE SIGNAL

1. Connect the ITS control unit connector and rear camera connector.
2. Turn the ignition switch ON.
3. Using an oscilloscope, check voltage between ITS control unit harness connector terminals.

Terminal				Condition	Voltage (Approx.)
(+)		(–)			
ITS control unit					
Connector	Terminal	Connector	Terminal		
M59	66	M59	50	"CAMERA" switch is ON or shift selector is in R (Reverse)	

Is inspection result normal?

YES >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Replace rear view camera. Refer to DAS-219, "Removal and Installation".

U1232 STEERING ANGLE SENSOR

DTC Logic

INFOID:0000000009464930

DTC	Display contents of CONSULT	DTC detection condition	Possible malfunction factor
U1232	ST ANGLE SEN CALIB	The neutral position registration of the steering angle sensor cannot finish.	• Steering angle sensor • ITS control unit

Diagnosis Procedure

INFOID:0000000009464931

1.REGISTER THE NEUTRAL POSITION OF THE STEERING ANGLE SENSOR

1. Turn the ignition switch ON.
2. Perform registration of the neutral position of the steering angle sensor. Refer to DAS-233, "CONSULT Function (AVM)".
3. Check “Self Diagnostic Result” of “AVM” with CONSULT. Refer to DAS-233, "CONSULT Function (AVM)".

Is “ST ANGLE SEN CALIB” detected?

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

2.CHECK STEERING ANGLE SENSOR

Check steering angle sensor.

Is the inspection result normal?

YES >> Replace ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

U1305 CAMERA IMAGE CALIB

DTC Logic

INFOID:0000000009464932

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1305	CAMERA CONFIG	ITS control unit configuration is incomplete	Perform ITS configuration with CONSULT

Diagnosis Procedure

INFOID:0000000009464933

1.CHECK SELF-DIAGNOSIS RESULTS

Check if “U1305” is current in “Self Diagnostic Result” of “AVM”.

Is “U1305” detected?

YES >> Perform ITS configuration using CONSULT. Refer to DAS-233, "CONSULT Function (AVM)". If problem persists, repair or replace the malfunctioning part.

NO >> Refer to GI-43, "Intermittent Incident".

U1308 CAMERA CONFIG

DTC Logic

INFOID:0000000009464934

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1308	ITS CALIB [U1308]	ITS control unit calibration is incomplete	Perform ITS calibration with CONSULT

Diagnosis Procedure

INFOID:0000000009464935

1.CHECK SELF-DIAGNOSIS RESULTS

Check if “U1308” is current in “Self Diagnostic Result” of “AVM”.

Is “U1308” detected?

YES >> Perform ITS calibration of camera image using CONSULT. Refer to DAS-233, "CONSULT Function (AVM)".

NO >> Refer to GI-43, "Intermittent Incident".

U1309 PUMP UNIT CURRENT

DTC Logic

INFOID:0000000009464936

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1309	PUMP UNIT CURRENT	ITS control unit detects the value of current from pump control unit is incorrect	• Rear view camera washer control unit • Harness • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U1309” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U1309” detected as the current malfunction?

YES >> Refer to DAS-273, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000009464937

Regarding Wiring Diagram information, refer to DAS-241, "Wiring Diagram".

1.CHECK REAR VIEW CAMERA AIR PUMP MOTOR POWER SUPPLY CIRCUIT

1. Disconnect the rear view camera washer control unit connector.
2. Turn the ignition switch ON.
3. Check voltage between rear view camera washer control unit connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
Rear view camera washer control unit				
Connector	Terminal			
B16	12	Ground	Ignition ON	12 V

Is inspection result normal?

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

2.CHECK REAR VIEW CAMERA AIR PUMP MOTOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Check for continuity between rear view camera washer control unit connector and ground.

Rear view camera washer control unit		Ground	Continuity
Connector	Terminal		
B16	5		Yes

Is the inspection result normal?

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

3.CHECK CONTINUITY ITS CONTROL UNIT TO REAR VIEW CAMERA WASHER CONTROL UNIT

1. Disconnect the ITS control unit connector.

2. Check for continuity between ITS control unit harness connector and rear view camera washer control unit connector.

ITS control unit		Rear view camera washer control unit		Continuity
Connector	Terminal	Connector	Terminal	
M58	2	B16	7	Yes
	3		8	

3. Check for continuity between ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	2		No
	3		

Is inspection result normal?

YES >> GO TO 4.
NO >> Repair the harness or connector.

4. CHECK CONTINUITY REAR VIEW CAMERA WASHER CONTROL UNIT TO PUMP

1. Disconnect rear view camera air pump connector.
2. Check for continuity between rear view camera washer control unit connector and pump connector.

Rear view camera washer control unit		Rear view camera air pump motor		Continuity
Connector	Terminal	Connector	Terminal	
B16	1	B17	1	Yes
	2		2	

3. Check for continuity between rear view camera washer control unit connector and ground.

Rear view camera washer control unit		Ground	Continuity
Connector	Terminal		
B16	1		No
	2		

Is inspection result normal?

YES >> GO TO 5.
NO >> Repair the harness or connector.

5. CHECK REAR VIEW CAMERA AIR PUMP MOTOR ITS CONTROL UNIT SUPPLY CIRCUIT

Momentarily connect a jumper from a fused battery positive to terminal 1 and from ground to terminal 2 of the rear view camera air pump motor.

Does the pump operate?

YES >> GO TO 6.
NO >> Replace the rear view camera air pump motor.

6. CHECK REAR VIEW CAMERA AIR PUMP MOTOR ITS CONTROL UNIT SUPPLY CIRCUIT

1. Reconnect the ITS control unit connector.
2. Turn the ignition switch ON.
3. Using CONSULT, activate the rear view camera air pump while checking voltage between rear view camera washer control unit connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
Rear view camera washer control unit				
Connector	Terminals			
B16	7, 8	Ground	Activating pump	5 V

Can voltage be measured on either terminal?

YES >> Replace rear view camera washer control unit.
NO >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".

U130B REAR CAMERA COMM ERROR

DTC Logic

INFOID:0000000009464938

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U130B	REAR CAMERA COMM ERROR	ITS control unit receives the incorrect communication signal from rear view camera.	• Rear view camera • Harness • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U130B” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U130B” detected as the current malfunction?

YES >> Refer to DAS-276, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000009464939

Regarding Wiring Diagram information, refer to DAS-241, "Wiring Diagram".

1.CONNECTOR CHECK

Check the ITS control unit and rear view camera connectors for the following:
- Proper connection
- Damage
- Disconnected or loose terminals

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair the terminal and connector.

2.CHECK REAR VIEW CAMERA VOLTAGE

1. Connect ITS control unit and rear view camera harness connectors.
2. Check voltage between ITS control unit connector M59 and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
ITS control unit				
Connector	Terminal			
M59	68	Ground	Ignition ON	5 V

Is the inspection result normal?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Replace rear view camera. Refer to DAS-219, "Removal and Installation".

U1310 PUMP UNIT CIRCUIT

DTC Logic

INFOID:0000000009464940

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detecting condition	Possible causes
U1310	PUMP UNIT CIRCUIT	ITS control unit detects the value of voltage from pump control unit is incorrect	• Rear view camera washer control unit • Harness • ITS control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform “All DTC Reading” with CONSULT.
3. Check if the “U1310” is detected as the current malfunction in “Self Diagnostic Result” of “AVM”.

Is “U1310” detected as the current malfunction?

YES >> Refer to DAS-277, "Diagnosis Procedure".
NO >> Inspection End.

Diagnosis Procedure

INFOID:0000000009464941

Regarding Wiring Diagram information, refer to DAS-241, "Wiring Diagram".

1.CHECK REAR VIEW CAMERA AIR PUMP MOTOR POWER SUPPLY CIRCUIT

1. Disconnect the rear view camera washer control unit connector.
2. Turn the ignition switch ON.
3. Check voltage between rear view camera washer control unit connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
Rear view camera washer control unit				
Connector	Terminal			
B16	12	Ground	Ignition ON	Battery voltage

Is inspection result normal?

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

2.CHECK REAR VIEW CAMERA AIR PUMP MOTOR GROUND CIRCUIT

1. Turn the ignition switch OFF.
2. Check for continuity between rear view camera washer control unit connector and ground.

Rear view camera washer control unit		Ground	Continuity
Connector	Terminal		
B16	5		Yes

Is the inspection result normal?

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

3.CHECK CONTINUITY ITS CONTROL UNIT TO REAR VIEW CAMERA WASHER CONTROL UNIT

1. Disconnect the ITS control unit connector.

2. Check for continuity between ITS control unit harness connector and rear view camera washer control unit connector.

ITS control unit		Rear view camera washer control unit		Continuity
Connector	Terminal	Connector	Terminal	
M58	2	B16	7	Yes
	3		8	

3. Check for continuity between ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	2		No
	3		

Is inspection result normal?

YES >> GO TO 4.
NO >> Repair the harness or connector.

4. CHECK CONTINUITY REAR VIEW CAMERA WASHER CONTROL UNIT TO PUMP

1. Disconnect rear view camera air pump connector.
2. Check for continuity between rear view camera washer control unit connector and pump connector.

Rear view camera washer control unit		Rear view camera air pump motor		Continuity
Connector	Terminal	Connector	Terminal	
B16	1	B17	1	Yes
	2		2	

3. Check for continuity between rear view camera washer control unit connector and ground.

Rear view camera washer control unit		Ground	Continuity
Connector	Terminal		
B16	1		No
	2		

Is inspection result normal?

YES >> GO TO 5.
NO >> Repair the harness or connector.

5. CHECK REAR VIEW CAMERA AIR PUMP MOTOR ITS CONTROL UNIT SUPPLY CIRCUIT

Momentarily connect a jumper from a fused battery positive to terminal 1 and from ground to terminal 2 of the rear view camera air pump motor.

Does the pump operate?

YES >> GO TO 6.
NO >> Replace the rear view camera air pump motor.

6. CHECK REAR VIEW CAMERA AIR PUMP MOTOR ITS CONTROL UNIT SUPPLY CIRCUIT

1. Reconnect the ITS control unit connector.
2. Turn the ignition switch ON.
3. Activate the rear view camera air pump while checking voltage between rear view camera washer control unit connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
Rear view camera washer control unit				
Connector	Terminals			
B16	7, 8	Ground	Activating pump	5 V

Can voltage be measured on either terminal?

YES >> Replace rear view camera washer control unit.
NO >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:0000000009464942

Regarding Wiring Diagram information, refer to DAS-241, "Wiring Diagram".

1.CHECK ITS CONTROL UNIT POWER SUPPLY CIRCUIT

Check voltage between ITS control unit harness connector and ground.

Terminal			Condition	Voltage (Approx.)
(+)		(–)		
ITS control unit		Ground	Ignition switch	
Connector	Terminal			
M58	20		OFF	Battery voltage
			ON	Battery voltage
	39		OFF	0 V
			ON	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair the ITS control unit power supply circuit.

2.CHECK ITS CONTROL UNIT GROUND CIRCUIT

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

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	40		Yes

Is the inspection result normal?

YES >> Inspection End.
NO >> Repair the ITS control unit ground circuit.

WARNING SYSTEMS SWITCH CIRCUIT

Component Function Check

INFOID:0000000009464943

1.CHECK WARNING SYSTEMS SWITCH INPUT SIGNAL

1. Turn the ignition switch ON.
2. Select the DATA MONITOR item “ITS SW 1” of “AVM” with CONSULT.
3. With operating the warning systems switch, check the monitor status.

Monitor item	Condition	Monitor status
ITS SW 1	Warning systems switch is pressed	On
	Warning systems switch is not pressed	OFF

Is the inspection result normal?

YES >> Warning systems switch circuit is normal.
NO >> Refer to DAS-281, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000009464944

Regarding Wiring Diagram information, refer to DAS-241, "Wiring Diagram".

1.CHECK WARNING SYSTEMS SWITCH SIGNAL INPUT

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

Terminals			Condition	Voltage (Approx.)
(+)		(–)		
ITS control unit		Ground	Warning systems switch	
Connector	Terminal			
M58	32		Pressed	0 V
			Released	12 V

Is the inspection result normal?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> GO TO 2.

2.CHECK WARNING SYSTEMS SWITCH

1. Turn ignition switch OFF.
2. Remove warning systems switch.
3. Check warning systems switch. Refer to DAS-282, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace the warning systems switch. Refer to DAS-142, "Removal and Installation".

3.CHECK WARNING SYSTEMS SWITCH GROUND CIRCUIT

Check continuity between warning system switch harness connector terminal and ground.

Warning system switch		Ground	Continuity
Connector	Terminal		
M62	8		Yes

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4.CHECK WARNING SYSTEMS SWITCH SIGNAL INPUT CIRCUIT FOR OPEN

1. Disconnect the ITS control unit connector.
2. Check continuity between the ITS control unit harness connector and warning system switch harness connector.

ITS control unit		Warning system switch		Continuity
Connector	Terminal	Connector	Terminal	
M58	32	M62	6	Yes

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair the harnesses or connectors.

5.CHECK WARNING SYSTEMS SWITCH SIGNAL INPUT CIRCUIT FOR SHORT

Check continuity between the ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	32		No

Is the inspection result normal?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Repair the harnesses or connectors.

Component Inspection

INFOID:0000000009464945

1.CHECK WARNING SYSTEMS SWITCH

Check continuity of warning systems switch.

Terminal		Condition	Continuity
6	8	When warning systems switch is pressed	Yes
		When warning systems switch is released	No

Is the inspection result normal?

YES >> Inspection End.
NO >> Replace the warning systems switch. Refer to DAS-142, "Removal and Installation".

WARNING SYSTEMS ON INDICATOR CIRCUIT

Component Function Check

INFOID:0000000009464946

1.CHECK WARNING SYSTEMS ON INDICATOR

1. Turn the ignition switch ON.
2. Select the active test item “BSW ON INDICATOR” of “AVM” with CONSULT.
3. With operating the test item, check the operation.

On : Warning systems ON indicator illuminates
Off : Warning systems ON indicator is turned OFF

Is the inspection result normal?

YES >> Inspection End.
NO >> Refer to DAS-283, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000009464947

Regarding Wiring Diagram information, refer to DAS-241, "Wiring Diagram".

1.CHECK WARNING ON INDICATOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect warning system switch connector.
3. Turn ignition switch ON.
4. Check voltage between warning system switch harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(−)	
Warning system switch		Ground	
Connector	Terminal		
M62	5		Battery voltage

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair the warning systems ON indicator power supply circuit.

2.CHECK WARNING SYSTEMS ON INDICATOR SIGNAL FOR OPEN

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

ITS control unit		Warning system switch		Continuity
Connector	Terminal	Connector	Terminal	
M58	33	M62	3	Yes

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair the harnesses or connectors.

3.CHECK WARNING SYSTEMS ON INDICATOR SIGNAL CIRCUIT FOR SHORT

Check continuity between the ITS control unit harness connector and ground.

ITS control unit		Ground	Continuity
Connector	Terminal		
M58	33		No

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair the harnesses or connectors.

4. CHECK WARNING SYSTEMS ON INDICATOR

Check the warning systems ON indicator. Refer to DAS-284, "Component Inspection".

Is the inspection result normal?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Replace warning systems switch. DAS-142, "Removal and Installation".

Component Inspection

INFOID:0000000009464948

1. CHECK WARNING SYSTEMS ON INDICATOR

Apply battery voltage to warning systems switch terminals 3 and 5, and then check if the warning systems ON indicator illuminates.

Terminals		Condition	Warning systems ON indicator
(+)	(-)		
5	3	When the battery voltage is applied	On
		When the battery voltage is not applied	Off

Is the inspection result normal?

YES >> Inspection End.
NO >> Replace the warning systems switch. Refer to DAS-142, "Removal and Installation".

WARNING BUZZER CIRCUIT

Component Function Check

INFOID:0000000009464949

1.CHECK WARNING BUZZER

1. Turn the ignition switch ON.
2. Select the active test item “BUZZER” of “BCM” with CONSULT.
3. With operating the test item, check the operation.

On : Warning buzzer is activated.
Off : Warning buzzer is not activated.

Is the inspection result normal?

YES >> Inspection End.
NO >> Refer to DAS-285, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000009464950

1.CHECK WARNING BUZZER OPERATION

While activating the buzzer with CONSULT, listen for the buzzer sound.

Does warning buzzer sound?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Replace the combination meter (buzzer).

SYMPTOM DIAGNOSIS

MOD SYSTEM SYMPTOMS

Symptom Table

INFOID:0000000009464951

CAUTION:
Perform the self-diagnosis with CONSULT before the symptom diagnosis. Perform the trouble diagnosis if any DTC is detected.
NOTE:
Refer to the following the operation condition of the Moving Object Detection system.
- Moving Object Detection system: DAS-228, "System Description".

Symptom		Possible cause	Inspection item/Reference page
Indicator/warning lamps do not illuminate when ignition switch OFF ⇒ ON.	All of indicator/warning lamps do not illuminate; • Moving Object Detection warning lamp • Moving Object Detection ON indicator • Warning systems ON indicator	• Power supply and ground circuit of ITS control unit • ITS control unit • Combination meter	Power supply and ground circuit of ITS control unit. Refer to DAS-280, "Diagnosis Procedure"
	Buzzer is not sounding	• Buzzer (combination meter)	Refer to DAS-285, "Component Function Check"

MOD SYSTEM DOES NOT ACTIVATE

Description

INFOID:0000000009464952

The switch does not turn ON
- When the Moving Object Detection system setting is ON, the Moving Object Detection ON indicator does not illuminate even if the warning system switch is depressed.

The switch does not turn OFF
- The Moving Object Detection ON indicator does not turn off even if the warning system switch is pressed when the Moving Object Detection ON indicator illuminates.

Diagnosis Procedure

INFOID:0000000009464953

1.CHECK MOVING OBJECT DETECTION SYSTEM SETTING

1. Start the engine.
2. After starting the engine wait for 5 seconds or more.
3. Check that Moving Object Detection system setting on the navigation screen is ON.

Is Moving Object Detection system setting ON?

YES >> GO TO 2.
NO >> Enable the Moving Object Detection system setting.

2.MOD SWITCH INSPECTION

1. Start the engine.
2. Check that “mod SW” operates normally in “DATA MONITOR” of “AVM” with CONSULT.

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 5.

3.CHECK MOVING OBJECT DETECTION ON INDICATOR CIRCUIT

1. Start the engine.
2. Select the active test item “MOD ON IND” of “AVM” with CONSULT.
3. Check if the Moving Object Detection ON indicator illuminates when the test item is operated.

Is the inspection result normal?

YES >> GO TO 6.
NO >> GO TO 4.

4.PERFORM THE SELF-DIAGNOSIS OF COMBINATION METER

1. Perform “All DTC Reading” with CONSULT.
2. Check if the DTC is detected in self-diagnosis results of “METER/M&A”. Refer to MWI-27, "DTC Index".

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 6.

5.PERFORM THE SELF-DIAGNOSIS

1. Perform “All DTC Reading” with CONSULT.
2. Check if the DTC is detected in self-diagnosis results of “AVM”. Refer to DAS-239, "DTC Index".

Is any DTC detected?

YES >> GO TO 6.
NO >> GO TO 7.

6.REPAIR OR REPLACE MALFUNCTIONING PARTS.

Repair or replace malfunctioning parts.

>> GO TO 7.

7.CHECK MOVING OBJECT DETECTION SYSTEM

1. Erase “self-diagnosis result”, and then perform “All DTC Reading” again after performing the action test. (Refer to DAS-254, "Description" for action test.)
2. Check that the Moving Object Detection system is normal.

>> Inspection End.

MOD SYSTEM SETTINGS CANNOT BE TURNED ON/OFF IN VEHICLE INFORMATION DISPLAY

Description

INFOID:0000000009464954

- Moving Object Detection system setting is not selectable on the vehicle information display screen.
  NOTE:
  When the ignition switch is in ACC position, Moving Object Detection system settings cannot be changed.
  - "Moving Object Detection" is not indicated on the vehicle information display screen.
  - The switching between ON and OFF cannot be performed by operating the vehicle information display setting system selection.
  - The item "Moving Object Detection" on the vehicle information display screen is not active.
- The Moving Object Detection system setting differs from the one set at the previous driving.
  NOTE:
  Turn OFF the ignition switch and wait for 5 seconds or more.

Diagnosis Procedure

INFOID:0000000009464955

1. CHECK MOVING OBJECT DETECTION SYSTEM SETTING

1. Start the engine.
2. Check that the Moving Object Detection system settings is selectable on the vehicle information display screen.

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 2.

2. PERFORM THE SELF-DIAGNOSIS

1. Perform self-diagnosis with CONSULT.
2. Check if the DTC is detected in self-diagnosis results of "AVM", "MULTI AV" and "METER/M&A". Refer to the following.

- AVM: DAS-239, "DTC Index"
- MULTI AV (with BOSE): AV-328, "DTC Index"
- MULTI AV (without BOSE): AV-231, "DTC Index"
- METER/M&A: MWI-27, "DTC Index"

Is any DTC detected?

YES >> Repair or replace malfunctioning parts.
NO >> Inspection End.

3. CHECK DATA MONITOR OF ITS CONTROL UNIT

Check that "MOD SELECT" operates normally in "DATA MONITOR" of "AVM" with CONSULT.

Is the inspection result normal?

YES >> Refer to DAS-233, "CONSULT Function (AVM)".
NO >> GO TO 4.

4. CHECK MULTIFUNCTION SWITCH

Operate the multifunction switch to check that the audio, navigation system, and air conditioner operate properly.

Is the inspection result normal?

YES >> Replace the ITS control unit. Refer to DAS-68, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

NORMAL OPERATING CONDITION

Description

INFOID:0000000009464956

MOVING OBJECT DETECTION

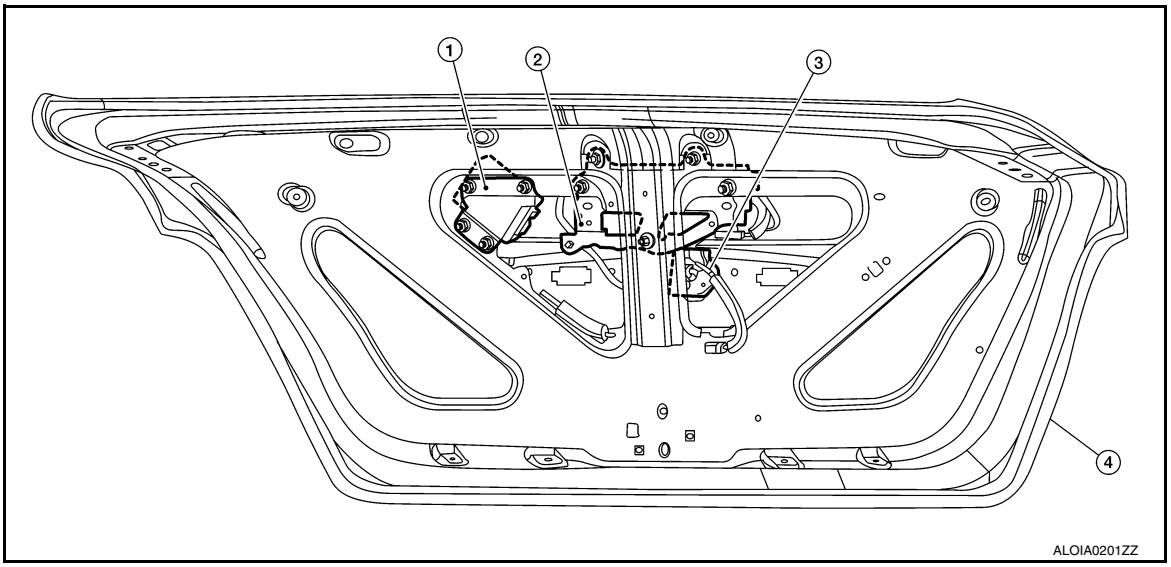
- The Moving Object Detection system is not a replacement for proper driving procedure and is not designed to prevent contact with vehicles or objects. When backing up. always look in the direction driver will move to ensure it is safe to proceed. Never rely solely on the Moving Object Detection system.
- Using the Moving Object Detection system under some road or weather condition could lead to improper system operation. Always rely on driver's own steering and braking operation to avoid accidents.
- The Moving Object Detection system may not provide a warning for vehicles that pass through the detection zone quickly.
- Do not use the Moving Object Detection system when towing a trailer.
- Excessive noise (e.g., audio system volume, open vehicle window) will interfere with the chime sound, and it may not be heard.
- Pedestrians, bicycles, animals.
- A vehicle passing at a speed greater than approximately 24km/h (15 MPH).
- A rear view camera may not detect approaching vehicles in certain situations:
- When the vehicle parked aside obstruct the beam of the rear view camera.
- When the vehicle is parked in an angled parking space.
- When the vehicle is parked on an inclined ground.
- When the vehicle turns around into your vehicle’s aisle.
- When the angle formed by your vehicle and approaching vehicle is small.
- Severe weather or road spray conditions may reduce the ability of the radar to detect other vehicles.
- The rear view camera system may not detect:
- Small or moving object.
- Wedge-shaped objects.
- Object closer to the bumper than 30 cm (10 inch).
- Thin objects such as rope, wire, chain, etc.
- Do not use the MOD system under the following conditions because the system may not function properly:
- When driving with a tire that is not the within normal tire condition (example: tire wear, low pressure, spare tire, chain, non-standard wheels).
- When the vehicle is equipped with non-original brake parts or suspension parts.

REMOVAL AND INSTALLATION

REAR VIEW CAMERA WASHER CONTROL UNIT

Exploded View

INFOID:0000000009464957



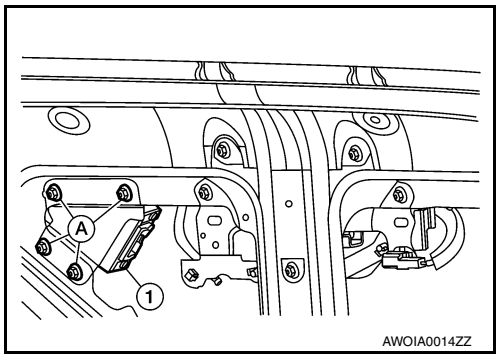
1. Rear view camera washer control unit
2. Rear view camera air pump motor
3. Rear view camera
4. Trunk lid

Removal and Installation

INFOID:0000000009464958

REMOVAL

1. Remove the trunk lid finisher. Refer to INT-33, "TRUNK LID FINISHER : Removal and Installation".
2. Disconnect the harness connector from the rear view camera washer control unit.
3. Remove the rear view camera washer control unit nuts (A).
4. Remove the rear view camera washer control unit (1).



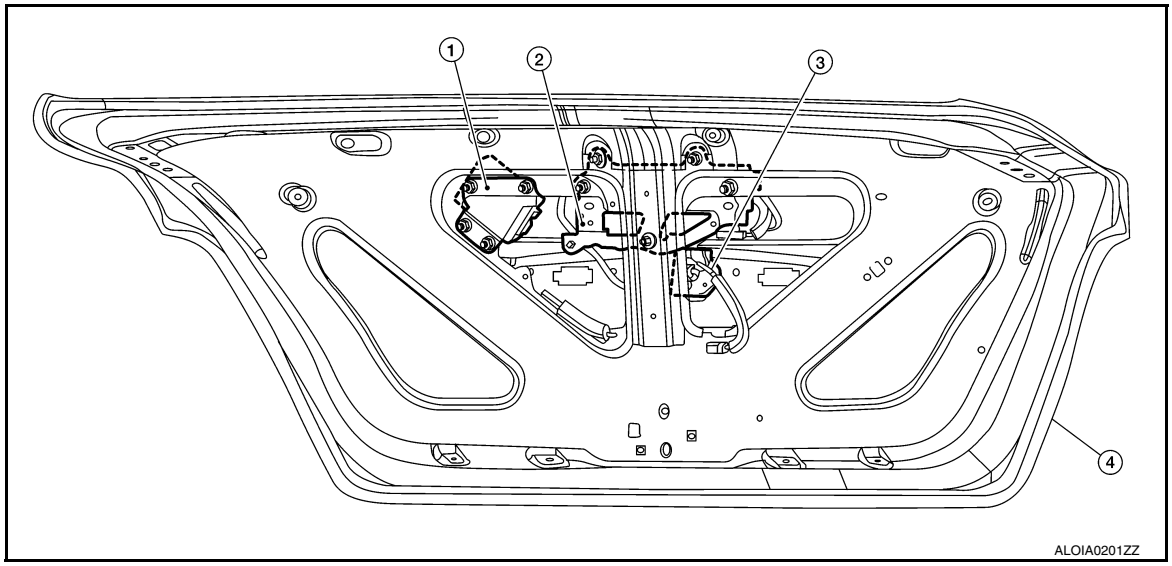
INSTALLATION

Installation is in the reverse order of removal.

REAR VIEW CAMERA AIR PUMP MOTOR

Exploded View

INFOID:0000000009464959



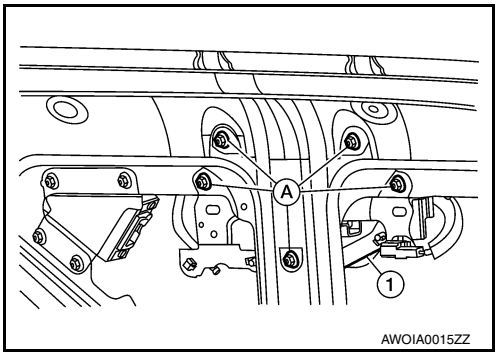
1. Rear view camera washer control unit
2. Rear view camera air pump motor
3. Rear view camera
4. Trunk lid

Removal and Installation

INFOID:0000000009464960

REMOVAL

1. Remove the trunk lid finisher. Refer to INT-33, "TRUNK LID FINISHER : Removal and Installation".
2. Disconnect the air tubes from the rear view camera air pump motor.
3. Disconnect the harness connector from the rear view camera air pump motor.
4. Remove the rear view camera air pump motor bracket nuts (A).
5. Remove the rear view camera air pump motor (1).



INSTALLATION

Installation is in the reverse order of removal.