

SECTION WW

WIPER & WASHER

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PRECAUTIONS

< PRECAUTION >

PRECAUTION

PRECAUTIONS

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

INFOID:000000007256285

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

WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

WARNING:

Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

Service Procedure Precautions for Models with a Pop-up Roll Bar

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WARNING:

Always observe the following items for preventing accidental activation.

- Risk of passenger injury or death may increase if the pop-up roll bar does not deploy during a roll over collision. In order to reduce the chance of an incident where the pop-up roll bar is inoperative, all maintenance must be performed by a NISSAN or INFINITI dealer.
- Before removing and installing the pop-up roll bar component parts and harness, always turn the ignition switch OFF, disconnect the battery negative terminal, and wait for 3 minutes or more. (The purpose of this operation is to discharge electricity that is accumulated in the auxiliary power supply circuit in the air bag diagnosis sensor unit.)
- When repairing, removing, and installing a pop-up roll bar, always refer to SRS AIR BAG and SRS AIR BAG CONTROL warnings in the Service Manual.

Precaution for Battery Service

INFOID:000000007256286

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

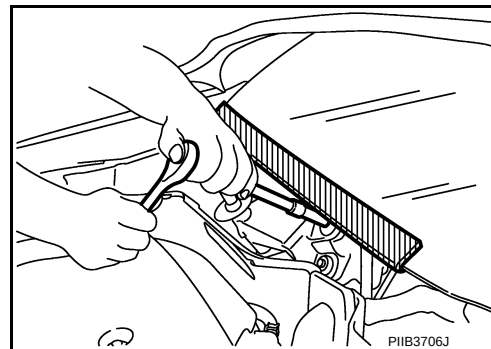
PRECAUTIONS

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Precaution for Procedure without Cowl Top Cover

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When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



COMPONENT PARTS

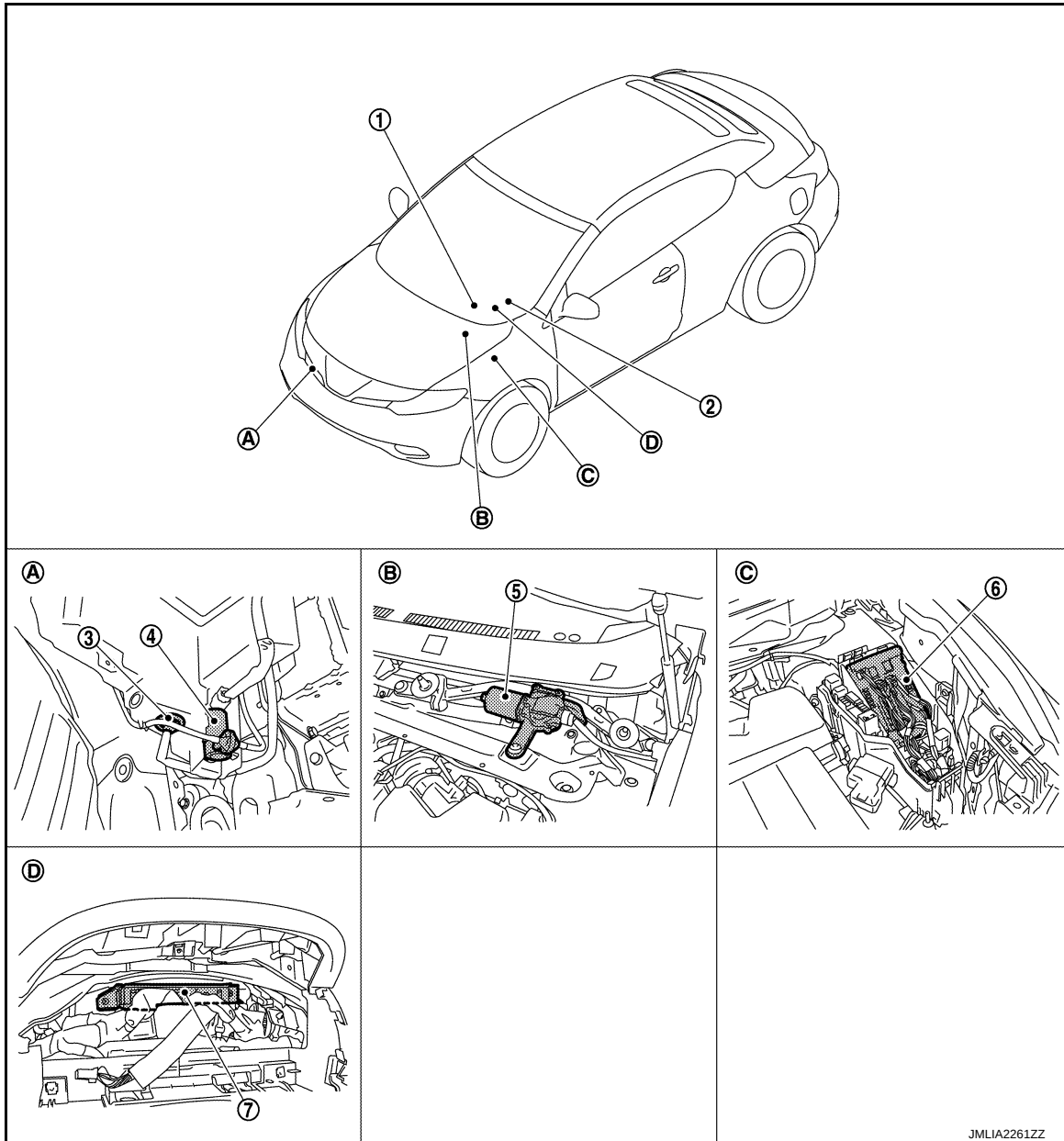
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SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

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- | | | |
|-------------------------------|---------------------------------------|----------------------------|
| 1. Combination switch | 2. Combination meter | 3. Washer level switch |
| 4. Washer pump | 5. Front wiper motor | 6. IPDM E/R |
| 7. BCM | | |
| A. Radiator core support (RH) | B. Cowl top, left side of engine room | C. Engine room (left side) |
| D. Behind combination meter | | |

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COMPONENT PARTS

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Component Description

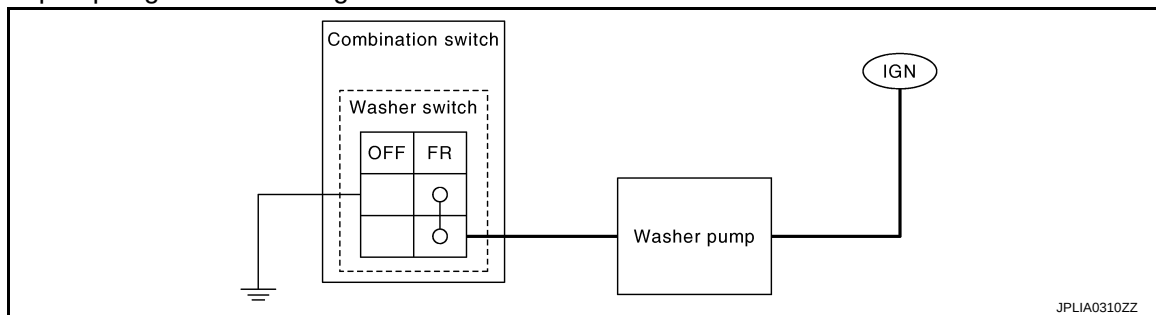
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Part	Description
IPDM E/R	- Controls the integrated relay according to the request (via CAN communication) from BCM. - Performs the auto stop control of the front wiper.
BCM	- Judges the each switch status by the combination switch reading function. - Requests (via CAN communication) the front wiper relay and the front wiper high relay ON to IPDM E/R. - Supplies power to the wiper motor. - Performs the auto stop control of the rear wiper.
Combination switch (Wiper & washer switch)	Refer to BCS-6, "COMBINATION SWITCH READING SYSTEM : System Description" .
Washer switch	Refer to WW-6, "Washer Switch" .
Washer pump	Washer fluid is sprayed according to washer switch states.
Washer level switch	Refer to MWI-6, "METER SYSTEM : Component Description" .
Front wiper motor	- IPDM E/R controls front wiper operation. - Front wiper auto stop signal is transmitted to IPDM E/R.
Combination meter	Transmits the vehicle speed signal to BCM via CAN communication.

Washer Switch

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- Washer switch is integrated with combination switch.
- Washer pump is grounded through the combination switch with the washer switch ON.



SYSTEM

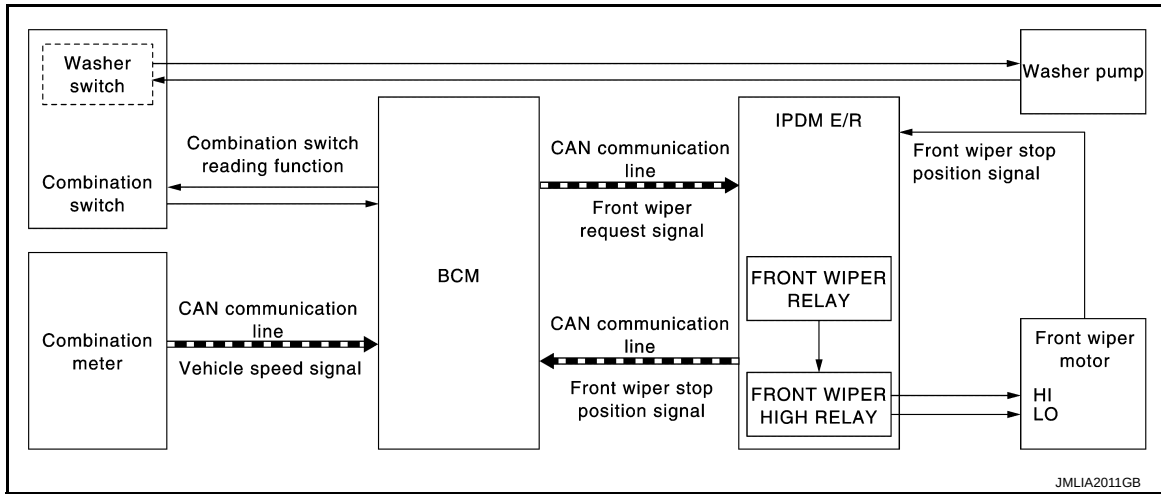
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SYSTEM

FRONT WIPER AND WASHER SYSTEM

FRONT WIPER AND WASHER SYSTEM : System Diagram

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FRONT WIPER AND WASHER SYSTEM : System Description

INFOID:000000007256989

OUTLINE

The front wiper is controlled by each function of BCM and IPDM E/R.

Control by BCM

- Combination switch reading function
- Front wiper control function

Control by IPDM E/R

- Front wiper control function
- Relay control function

Combination meter indicates low washer fluid warning judged with the signal from the washer level switch. For details of low washer fluid warning, refer to [MWI-15, "INFORMATION DISPLAY : System Description"](#).

FRONT WIPER BASIC OPERATION

- BCM detects the combination switch condition by the combination switch reading function.
- BCM transmits the front wiper request signal to IPDM E/R with CAN communication depending on each operating condition of the front wiper.
- IPDM E/R turns ON/OFF the integrated front wiper relay and the front wiper high relay according to the front wiper request signal. IPDM E/R provides the power supply to operate the front wiper HI/LO operation.

FRONT WIPER LO OPERATION

- BCM transmits the front wiper request signal (LO) to IPDM E/R with CAN communication according to the front wiper LO operating condition.

Front wiper LO operating condition

- Ignition switch ON
- Front wiper switch LO or front wiper switch MIST (while pressing)
- IPDM E/R turns ON the integrated front wiper relay according to the front wiper request signal (LO).

FRONT WIPER HI OPERATION

- BCM transmits the front wiper request signal (HI) to IPDM E/R with CAN communication according to the front wiper HI operating condition.

Front wiper HI operating condition

- Ignition switch ON
- Front wiper switch HI
- IPDM E/R turns ON the integrated front wiper relay and the front wiper high relay according to the front wiper request signal (HI).

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SYSTEM

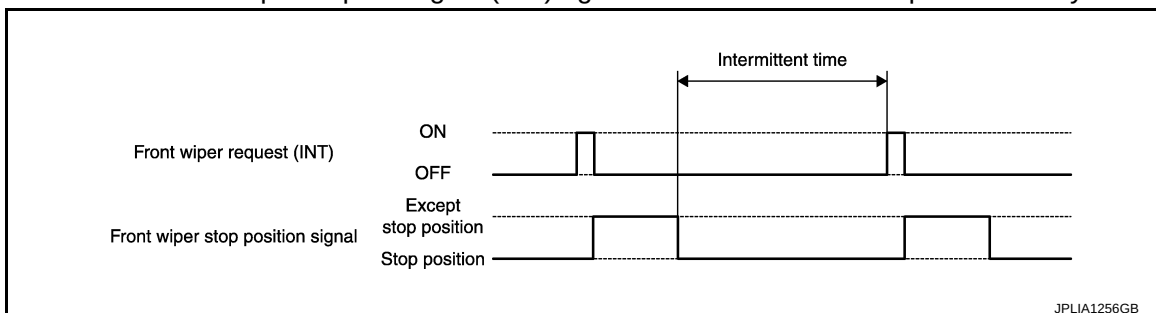
< SYSTEM DESCRIPTION >

FRONT WIPER INT OPERATION

- BCM transmits the front wiper request signal (INT) to IPDM E/R with CAN communication depending on the front wiper INT operating condition and intermittent operation delay interval according to the wiper intermittent dial position.

Front wiper INT operating condition

- Ignition switch ON
- Front wiper switch INT
- IPDM E/R turns ON the integrated front wiper relay so that the front wiper is operated only once according to the front wiper request signal (INT).
- BCM detects stop position/except stop position of the front wiper motor according to the front wiper stop position signal received from IPDM E/R with CAN communication.
- BCM transmits the front wiper request signal (INT) again after the intermittent operation delay interval.



NOTE:

Factory setting of the front wiper intermittent operation is the operation without vehicle speed. Front wiper intermittent operation can be set to the operation with vehicle speed by CONSULT. Refer to [WW-11, "WIPER : CONSULT Function - WIPER"](#).

Front wiper intermittent operation with vehicle speed

- BCM calculates the intermittent operation delay interval from the following
- Vehicle speed signal (received from the combination meter with CAN communication)
- Wiper intermittent dial position

Wiper intermittent dial position	Intermittent operation interval	Intermittent operation delay Interval (s)			
		Vehicle speed			
		0 – 5 km/h (0 – 3.1 MPH)	5 – 35 km/h (3.1 – 21.7 MPH)	35 – 65 km/h* (21.7 – 40.4 MPH)	65 km/h (40.4 MPH) or more
1	Short ↑	0.8	0.6	0.4	0.24
2		4	3	2	1.2
3		10	7.5	5	3
4		16	12	8	4.8
5		24	18	12	7.2
6	Long ↓	32	24	16	9.6
7		42	31.5	21	12.6

*: When without vehicle speed setting

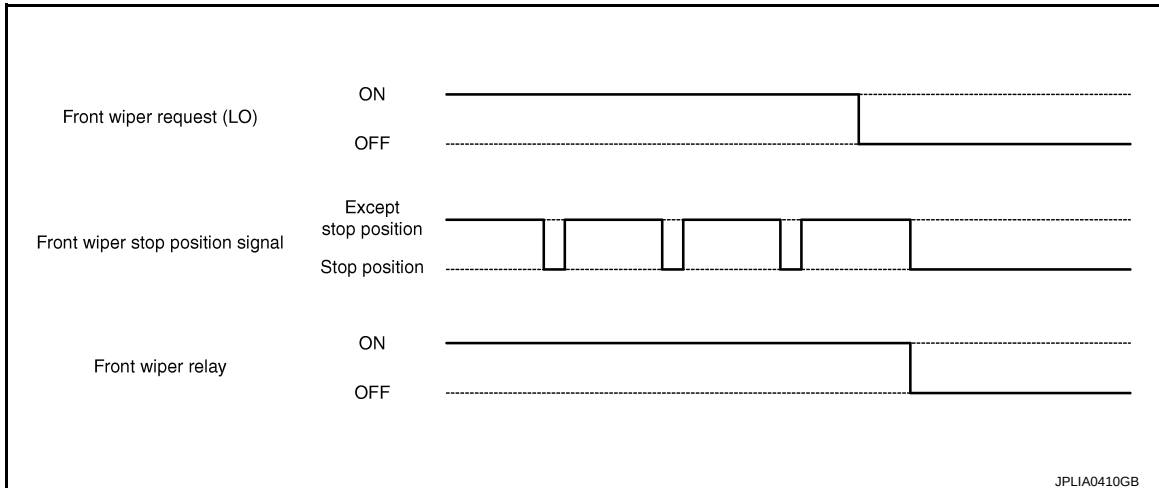
FRONT WIPER AUTO STOP OPERATION

- BCM stops transmitting the front wiper request signal when the front wiper switch is turned OFF.
- IPDM E/R detects the front wiper stop position signal from the front wiper motor and detects the front wiper motor position (stop position/except stop position).

SYSTEM

< SYSTEM DESCRIPTION >

- When the front wiper request signal is stopped, IPDM E/R turns ON the front wiper relay until the front wiper motor returns to the stop position.



NOTE:

- BCM stops the transmitting of the front wiper request signal when the ignition switch is OFF.
- IPDM E/R turns the front wiper relay OFF when the ignition switch is OFF.

FRONT WIPER OPERATION LINKED WITH WASHER

- BCM transmits the front wiper request signal (LO) to IPDM E/R with CAN communication according to the washer linked operating condition of the front wiper.
- BCM transmits the front wiper request signal (LO) so that the front wiper operates approximately 2 times when the front washer switch OFF is detected.

Washer linked operating condition of front wiper

- Ignition switch ON
- Front washer switch ON (0.4 second or more)
- IPDM E/R turns ON the integrated front wiper relay according to the front wiper request signal (LO).
- The washer pump is grounded through the combination switch with the washer switch ON.

FRONT WIPER AND WASHER SYSTEM : Fail-Safe

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When CAN communication with ECM and BCM is impossible, IPDM E/R performs fail-safe control. After CAN communication recovers normally, it also returns to normal control.

If No CAN Communication Is Available With BCM

Control part	Fail-safe operation
Front wiper motor	- The status just before activation of fail-safe control is maintained until the ignition switch is turned OFF while the front wiper is operating at LO or HI speed. - The wiper is operated at LO speed until the ignition switch is turned OFF if the fail-safe control is activated while the front wiper is set in the INT mode and the front wiper motor is operating. - Returns automatically wiper to stop position when ignition switch is turned ON if fail-safe control is activated while front wiper motor is operated and wiper stop in the other position than stop position. - The status is held at service position if the fail-safe control is activated while the service position function is operating.

IPDM E/R detects front wiper stop position by a front wiper stop position signal.

When a front wiper stop position signal is in the conditions listed below, IPDM E/R stops power supply to wiper after repeating a front wiper 10 seconds activation and 20 seconds stop.

Ignition switch	Front wiper switch	Front wiper stop position signal
ON	OFF	The front wiper stop position signal (stop position) cannot be input for 10 seconds.
	ON	The front wiper stop position signal does not change for 10 seconds.

NOTE:

This operation status can be confirmed on the IPDM E/R "Data Monitor" that displays "BLOCK" for the item "WIP PROT" while the wiper is stopped.

DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

DIAGNOSIS SYSTEM (BCM)

COMMON ITEM

COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)

INFOID:000000007256289

APPLICATION ITEM

CONSULT performs the following functions via CAN communication with BCM.

Diagnosis mode	Function Description
Work Support	Changes the setting for each system function.
Self Diagnostic Result	Displays the diagnosis results judged by BCM.
CAN Diag Support Monitor	Monitors the reception status of CAN communication viewed from BCM.
Data Monitor	The BCM input/output signals are displayed.
Active Test	The signals used to activate each device are forcibly supplied from BCM.
Ecu Identification	The BCM part number is displayed.
Configuration	- Read and save the vehicle specification. - Write the vehicle specification when replacing BCM.

SYSTEM APPLICATION

BCM can perform the following functions for each system.

NOTE:

It can perform the diagnosis modes except the following for all sub system selection items.

×: Applicable item

System	Sub system selection item	Diagnosis mode		
		Work Support	Data Monitor	Active Test
Door lock	DOOR LOCK	×	×	×
Rear window defogger	REAR DEFOGGER		×	×
Warning chime	BUZZER		×	×
Interior room lamp timer	INT LAMP	×	×	×
Exterior lamp	HEAD LAMP	×	×	×
Wiper and washer	WIPER	×	×	×
Turn signal and hazard warning lamps	FLASHER	×	×	×
—	AIR CONDITONER*			
- Intelligent Key system - Engine start system	INTELLIGENT KEY	×	×	×
Combination switch	COMB SW		×	
Body control system	BCM	×		
NVIS - NATS	IMMU		×	×
Interior room lamp battery saver	BATTERY SAVER	×	×	×
Trunk lid opener system	TRUNK		×	×
Vehicle security system	THEFT ALM	×	×	×
RAP system	RETAINED PWR		×	
Signal buffer system	SIGNAL BUFFER		×	×
TPMS	AIR PRESSURE MONITOR	×	×	×

NOTE:

*: This item is displayed, but is not used.

FREEZE FRAME DATA (FFD)

The BCM records the following vehicle condition at the time a particular DTC is detected, and displays on CONSULT.

DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

CONSULT screen item	Indication/Unit	Description	
Vehicle Speed	km/h	Vehicle speed of the moment a particular DTC is detected	
Odo/Trip Meter	km	Total mileage (Odometer value) of the moment a particular DTC is detected	
Vehicle Condition	SLEEP>LOCK	Power position status of the moment a particular DTC is detected	While turning BCM status from low power consumption mode to normal mode (Power supply position is "LOCK"*)
	SLEEP>OFF		While turning BCM status from low power consumption mode to normal mode (Power supply position is "OFF".)
	LOCK>ACC		While turning power supply position from "LOCK" to "ACC"
	ACC>ON		While turning power supply position from "ACC" to "IGN"
	RUN>ACC		While turning power supply position from "RUN" to "ACC" (Vehicle is stopping and selector lever is except P position.)
	CRANK>RUN		While turning power supply position from "CRANKING" to "RUN" (From cranking up the engine to run it)
	RUN>URGENT		While turning power supply position from "RUN" to "ACC" (Emergency stop operation)
	ACC>OFF		While turning power supply position from "ACC" to "OFF"
	OFF>LOCK		While turning power supply position from "OFF" to "LOCK"*
	OFF>ACC		While turning power supply position from "OFF" to "ACC"
	ON>CRANK		While turning power supply position from "IGN" to "CRANKING"
	OFF>SLEEP		While turning BCM status from normal mode (Power supply position is "OFF".) to low power consumption mode
	LOCK>SLEEP		While turning BCM status from normal mode (Power supply position is "LOCK"*) to low power consumption mode
	LOCK		Power supply position is "LOCK"*
	OFF		Power supply position is "OFF" (Ignition switch OFF)
	ACC		Power supply position is "ACC" (Ignition switch ACC)
	ON		Power supply position is "IGN" (Ignition switch ON with engine stopped)
	ENGINE RUN		Power supply position is "RUN" (Ignition switch ON with engine running)
	CRANKING		Power supply position is "CRANKING" (At engine cranking)
IGN Counter	0 - 39	The number of times that ignition switch is turned ON after DTC is detected • The number is 0 when a malfunction is detected now. • The number increases like 1 → 2 → 3...38 → 39 after returning to the normal condition whenever ignition switch OFF → ON. • The number is fixed to 39 until the self-diagnosis results are erased if it is over 39.	

NOTE:

*: Power supply position shifts to "LOCK" from "OFF", when ignition switch is in the OFF position, selector lever is in the P position, and any of the following conditions are met.

- Closing door
- Opening door
- Door is locked using door request switch
- Door is locked using Intelligent Key

The power supply position shifts to "ACC" when the push-button ignition switch (push switch) is pushed at "LOCK".

WIPER

WIPER : CONSULT Function - WIPER

INFOID:000000007238338

WORK SUPPORT

DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

Service item	Setting item	Description
WIPER SPEED SETTING	On	With vehicle speed (Front wiper intermittent time linked with the vehicle speed and wiper intermittent dial position)
	Off*	Without vehicle speed (Front wiper intermittent time linked with the wiper intermittent dial position)

*:Factory setting

DATA MONITOR

Monitor Item [Unit]	Description
PUSH SW [Off/On]	The switch status input from push-button ignition switch
VEH SPEED 1 [km/h]	Displays the value of the vehicle speed signal received from combination meter via CAN communication
FR WIPER HI [Off/On]	Status of each switch judged by BCM using the combination switch reading function
FR WIPER LOW [Off/On]	
FR WASHER SW [Off/On]	
FR WIPER INT [Off/On]	
FR WIPER STOP [Off/On]	Displays the status of the front wiper stop position signal received from IPDM E/R via CAN communication.
INT VOLUME [1 – 7]	Status of each switch judged by BCM using the combination switch reading function
H/L WASH SW [Off/On]	NOTE: The item is indicated, but not monitored

ACTIVE TEST

Test item	Operation	Description
FR WIPER	Hi	Transmits the front wiper request signal (HI) to IPDM E/R via CAN communication to operate the front wiper HI operation.
	Lo	Transmits the front wiper request signal (LO) to IPDM E/R via CAN communication to operate the front wiper LO operation.
	INT	Transmits the front wiper request signal (INT) to IPDM E/R via CAN communication to operate the front wiper INT operation.
	Off	Stops transmitting the front wiper request signal to stop the front wiper operation.

DIAGNOSIS SYSTEM (IPDM E/R)

< SYSTEM DESCRIPTION >

DIAGNOSIS SYSTEM (IPDM E/R)

Diagnosis Description

INFOID:000000007256290

AUTO ACTIVE TEST

Description

In auto active test mode, the IPDM E/R sends a drive signal to the following systems to check their operation.

- Oil pressure warning lamp
- Front wiper (LO, HI)
- Parking lamp
- License plate lamp
- Side maker lamp
- Tail lamp
- Front fog lamp
- Headlamp (LO, HI)
- A/C compressor (magnet clutch)
- Cooling fan

Operation Procedure

NOTE:

Never perform auto active test in the following conditions.

- CONSULT is connected
 - Passenger door is open
1. Close the hood and lift the wiper arms from the windshield. (Prevent windshield damage due to wiper operation)
NOTE:
When auto active test is performed with hood opened, sprinkle water on windshield beforehand.
 2. Turn the ignition switch OFF.
 3. Turn the ignition switch ON, and within 20 seconds, press the front door switch (driver side) 10 times. Then turn the ignition switch OFF.
 4. Turn the ignition switch ON within 10 seconds. After that the horn sounds once and the auto active test starts.
 5. After a series of the following operations is repeated 3 times, auto active test is completed.

NOTE:

- When auto active test has to be cancelled halfway through test, turn the ignition switch OFF.
- When auto active test is not activated, door switch may be the cause. Check door switch. Refer to [DLK-83, "Component Function Check"](#).

Inspection in Auto Active Test Mode

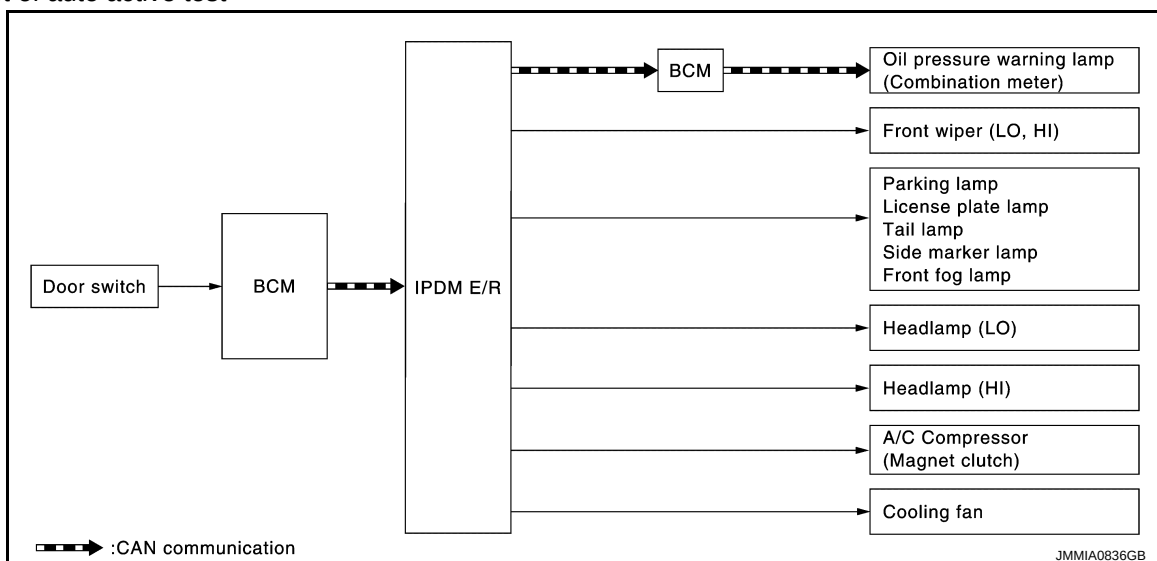
When auto active test mode is actuated, the following 6 steps are repeated 3 times.

Operation sequence	Inspection location	Operation
1	Oil pressure warning lamp	Blinks continuously during operation of auto active test
2	Front wiper motor	LO for 5 seconds → HI for 5 seconds
3	• Parking lamp • License plate lamp • Side maker lamp • Tail lamp • Front fog lamp	10 seconds
4	Headlamp	LO ⇔ HI 5 times
5	A/C compressor (magnet clutch)	ON ⇔ OFF 5 times
6	Cooling fan	LO for 5 seconds → MID for 3 seconds → HI for 2 seconds

DIAGNOSIS SYSTEM (IPDM E/R)

< SYSTEM DESCRIPTION >

Concept of auto active test



- IPDM E/R starts the auto active test with the door switch signals transmitted by BCM via CAN communication. Therefore, the CAN communication line between IPDM E/R and BCM is considered normal if the auto active test starts successfully.
- The auto active test facilitates troubleshooting if any systems controlled by IPDM E/R cannot be operated.

Diagnosis chart in auto active test mode

Symptom	Inspection contents	Possible cause
Any of the following components do not operate • Parking lamp • License plate lamp • Side maker lamp • Tail lamp • Front fog lamp • Headlamp (HI, LO) • Front motor wiper	Perform auto active test. Does the applicable system operate?	YES BCM signal input circuit
		NO • Lamp or motor • Lamp or motor ground circuit • Harness or connector between IPDM E/R and applicable system • IPDM E/R
A/C compressor does not operate	Perform auto active test. Does the magnet clutch operate?	YES • A/C amp. signal input circuit • CAN communication signal between A/C amp. and ECM • CAN communication signal between ECM and IPDM E/R
		NO • Magnet clutch • Harness or connector between IPDM E/R and magnet clutch • IPDM E/R
Oil pressure warning lamp does not operate	Perform auto active test. Does the oil pressure warning lamp blink?	YES • Harness or connector between IPDM E/R and oil pressure switch • Oil pressure switch • IPDM E/R
		NO • CAN communication signal between IPDM E/R and BCM • CAN communication signal between BCM and combination meter • Combination meter

DIAGNOSIS SYSTEM (IPDM E/R)

< SYSTEM DESCRIPTION >

Symptom	Inspection contents		Possible cause
Cooling fan does not operate	Perform auto active test. Does the cooling fan operate?	YES	- ECM signal input circuit - CAN communication signal between ECM and IPDM E/R
		NO	- Harness or connector between IPDM E/R and cooling fan motor - Harness or connector between IPDM E/R and cooling fan relay - Cooling fan motor - Cooling fan relay - IPDM E/R

CONSULT Function (IPDM E/R)

INFOID:000000007256291

APPLICATION ITEM

CONSULT performs the following functions via CAN communication with IPDM E/R.

Diagnosis mode	Description
Ecu Identification	Allows confirmation of IPDM E/R part number.
Self Diagnostic Result	Displays the diagnosis results judged by IPDM E/R.
Data Monitor	Displays the real-time input/output data from IPDM E/R input/output data.
Active Test	IPDM E/R can provide a drive signal to electronic components to check their operations.
CAN Diag Support Monitor	The results of transmit/receive diagnosis of CAN communication can be read.

SELF DIAGNOSTIC RESULT

Refer to [PCS-23, "DTC Index"](#).

DATA MONITOR

Monitor item

Monitor Item [Unit]	MAIN SIG- NALS	Description
MOTOR FAN REQ [1/2/3/4]	×	Displays the value of the cooling fan speed request signal received from ECM via CAN communication.
AC COMP REQ [Off/On]	×	Displays the status of the A/C compressor request signal received from ECM via CAN communication.
TAIL&CLR REQ [Off/On]	×	Displays the status of the position light request signal received from BCM via CAN communication.
HL LO REQ [Off/On]	×	Displays the status of the low beam request signal received from BCM via CAN communication.
HL HI REQ [Off/On]	×	Displays the status of the high beam request signal received from BCM via CAN communication.
FR FOG REQ [Off/On]	×	Displays the status of the front fog light request signal received from BCM via CAN communication.
FR WIP REQ [Stop/1LOW/Low/Hi]	×	Displays the status of the front wiper request signal received from BCM via CAN communication.
WIP AUTO STOP [STOP P/ACT P]	×	Displays the status of the front wiper auto stop signal judged by IPDM E/R.
WIP PROT [Off/BLOCK]	×	Displays the status of the front wiper fail-safe operation judged by IPDM E/R.
IGN RLY1 -REQ [Off/On]		Displays the status of the ignition switch ON signal received from BCM via CAN communication.
IGN RLY [Off/On]	×	Displays the status of the ignition relay judged by IPDM E/R.
PUSH SW [Off/On]		Displays the status of the push-button ignition switch judged by IPDM E/R.

DIAGNOSIS SYSTEM (IPDM E/R)

< SYSTEM DESCRIPTION >

Monitor Item [Unit]	MAIN SIG- NALS	Description
INTER/NP SW [Off/On]		Displays the status of the shift position judged by IPDM E/R.
ST RLY CONT [Off/On]		Displays the status of the starter relay status signal received from BCM via CAN communication.
IHBT RLY -REQ [Off/On]		Displays the status of the starter control relay signal received from BCM via CAN communication.
ST/INHI RLY [Off/ ST ON/INHI ON/UNKWN]		Displays the status of the starter relay and starter control relay judged by IPDM E/R.
DETENT SW [Off/On]		Displays the status of the CVT shift selector (detention switch) judged by IPDM E/R.
S/L RLY -REQ [Off/On]		NOTE: The item is indicated, but not monitored.
S/L STATE [LOCK/UNLOCK/UNKWN]		NOTE: The item is indicated, but not monitored.
DTRL REQ [Off/On]		NOTE: The item is indicated, but not monitored.
OIL P SW [Open/Close]		Displays the status of the oil pressure switch judged by IPDM E/R.
HOOD SW [Off/On]		NOTE: The item is indicated, but not monitored.
HL WASHER REQ [Off/On]		NOTE: The item is indicated, but not monitored.
THFT HRN REQ [Off/On]		Displays the status of the theft warning horn request signal received from BCM via CAN communication.
HORN CHIRP [Off/On]		Displays the status of the horn reminder signal received from BCM via CAN communication.
CRNRNG LMP REQ [Off/On]		NOTE: The item is indicated, but not monitored.

ACTIVE TEST

Test item

Test item	Operation	Description
CORNERING LAMP	Off	NOTE: The item is indicated, but cannot be tested.
	LH	
	RH	
HORN	On	Operates horn relay for 20 ms.
FRONT WIPER	Off	OFF
	Lo	Operates the front wiper relay.
	Hi	Operates the front wiper relay and front wiper high relay.
MOTOR FAN	1	OFF
	2	Operates the cooling fan relay-1.
	3	Operates the cooling fan relay-2.
	4	Operates the cooling fan relay-2 and cooling fan relay-3.
HEAD LAMP WASHER	On	NOTE: The item is indicated, but cannot be tested.

DIAGNOSIS SYSTEM (IPDM E/R)

< SYSTEM DESCRIPTION >

Test item	Operation	Description
EXTERNAL LAMPS	Off	OFF
	TAIL	Operates the tail lamp relay.
	Lo	Operates the headlamp low relay.
	Hi	Operates the headlamp low relay and ON/OFF the headlamp high relay at 1 second intervals.
	Fog	Operates the front fog lamp relay.

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BCM, IPDM E/R

< ECU DIAGNOSIS INFORMATION >

ECU DIAGNOSIS INFORMATION

BCM, IPDM E/R

List of ECU Reference

INFOID:000000007256292

ECU	Reference
BCM	BCS-31, "Reference Value"
	BCS-53, "Fail-safe"
	BCS-53, "DTC Inspection Priority Chart"
	BCS-54, "DTC Index"
IPDM E/R	PCS-15, "Reference Value"
	PCS-21, "Fail-safe"
	PCS-23, "DTC Index"

WIPER AND WASHER SYSTEM

< WIRING DIAGRAM >

FRONT WIPER AND WASHER SYSTEM

Connector No.	E8
Connector Name	WIRE TO WIRE
Connector Type	HS12MBR-CS



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

Terminal No.	Color of Wire	Signal Name [Specification]
3	GR	-
4	SB	-
8	G	-
10	Y	-
11	G	-

Connector No.	E10
Connector Name	FROM E/R INTELLIGENT POWER DISTRIBUTION MODULE (ENGINE ROOM)
Connector Type	TH20FW-CS12-M4-1V



9	10	11	12	13	14
15	16	17	18	19	20
21	22	23	24	25	26
27	28	29	30	31	32
33	34	35	36	37	38

Terminal No.	Color of Wire	Signal Name [Specification]
4	LG	-
5	Y	-
7	GR	-
10	BR	-
12	B	-
13	SB	-
15	W	-
16	R	-
19	Y	-
20	L	-
21	O	-
22	SB	-
23	GR	-
24	G	-
25	GR	-
26	Y	-
27	W	-

28	SB	-
30	BR	-
34	O	-
35	Y	-
36	G	-
38	W	-

Connector No.	E11
Connector Name	FROM E/R INTELLIGENT POWER DISTRIBUTION MODULE (ENGINE ROOM)
Connector Type	TH08FW-NH



42	41	40	39
46	45	44	43

Terminal No.	Color of Wire	Signal Name [Specification]
39	P	-
40	L	-
41	B	-
42	SB	-
43	Y	-
44	W	-
45	O	-
46	BR	-

Connector No.	E12
Connector Name	FRONT WIPER MOTOR
Connector Type	HS06FGY



3	2	1
5	4	

Terminal No.	Color of Wire	Signal Name [Specification]
1	LG	-
2	B/W	-
4	Y	-
5	R	-

Connector No.	E105
Connector Name	WIRE TO WIRE
Connector Type	TH10MW-CS10-M3



Terminal No.	Color of Wire	Signal Name [Specification]
3	Y	-
5	LG	-
8	G	-
11	P	-
12	L	-
13	Y	-
14	O	-
15	BR	-
19	L	-
20	Y	-
21	BR	-
22	P	-
24	L	-
25	O	-
28	SB	-
29	W	-
30	Y	-
49	SB	-
50	GR	-
51	LG	-
52	V	-
53	GR	-
54	BR	-
55	Y	-
56	O	-
60	V	-
61	BR	-
62	O	-
63	W	-
64	SHIELD	-
66	W	-
67	BR	-
68	Y	-
69	SB	-
70	GR	-
71	SB	-
72	Y	-
75	BR	-

76	GR	-
77	O	-
78	Y	-
79	Y	-
80	Y	-
81	Y	-
82	LG	-
83	GR	-

Connector No.	E322
Connector Name	WASHER PUMP
Connector Type	ED2FGY-RS



1	2
---	---

Terminal No.	Color of Wire	Signal Name [Specification]
1	W	-
2	O	-

Connector No.	E339
Connector Name	WIRE TO WIRE
Connector Type	NS12FBR-CS



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

Terminal No.	Color of Wire	Signal Name [Specification]
3	O	-
4	G	-
8	G	-
10	Y	-
11	R	-

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WIPER AND WASHER SYSTEM

< WIRING DIAGRAM >

FRONT WIPER AND WASHER SYSTEM

Connector No.	E345
Connector Name	SWAYLE INTELLIGENT POWER DISTRIBUTION MODULE (ENGINE ROOM)
Connector Type	NS08FW-CS



85	84	83
90	89	88
87	86	

Connector No.	M4
Connector Name	DATA LINK CONNECTOR
Connector Type	BD10FW



11	14	18
3	4	5
6	7	8

Terminal No.	Color of Wire	Signal Name [Specification]
83	Y	-
84	L	-
86	SB	-
87	GR	-
88	W	-
89	L	-
90	G	-

Connector No.	M1
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS08FW-M2



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

Terminal No.	Color of Wire	Signal Name [Specification]
1A	Y	-
2A	G	-
3A	Y	-
4A	GR	-
5A	R	-
6A	W	-
7A	LG	-
8A	Y	-

25	L	-
28	BR	-
29	L	-
30	R	-
49	W	-
50	GR	-
51	LG	-
52	Y	-
53	V	-
54	SB	-
55	P	-
56	O	-
60	V	-
61	GR	-
62	O	-
63	W	-
64	SHIELD	-
66	W	-
67	R	-
68	W	-
69	P	-
70	P	-
71	G	-
72	BR	-
75	BR	-
76	R	-
77	G	-
78	Y	-
79	G	-
80	Y	-
81	Y	-
82	W	-
83	G	-

Connector No.	M34
Connector Name	COMBINATION METER
Connector Type	TH10FW-MH



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
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Terminal No.	Color of Wire	Signal Name [Specification]
1	Y	BATTERY POWER SUPPLY
2	O	IGNITION SIGNAL
3	B	GROUND

4	B	GROUND
5	SB	ILLUMINATION CONTROL SIGNAL
8	SB	TRIP RESET SIGNAL
9	W	ILLUMINATION CONTROL SIGNAL (CLIMATE CONTROL SWITCH)
10	O	METER CONTROL SWITCH GROUND
11	L	ENTER SWITCH SIGNAL
12	R	SELECT SWITCH SIGNAL
13	V	ILLUMINATION CONTROL SWITCH SIGNAL (+)
14	GR	ILLUMINATION CONTROL SWITCH SIGNAL (-)
15	BR	AIR BAG SIGNAL
18	L	AMBIENT SENSOR SIGNAL
19	P	A/C AUTO AMP. CONNECTION RECOGNITION SIGNAL
20	Y	AMBIENT SENSOR GROUND
21	L	CAN-H
22	P	CAN-L
23	B	GROUND
24	W	FUEL LEVEL SENSOR GROUND
25	BR	ALTERNATOR SIGNAL
26	G	PARKING BRAKE SWITCH SIGNAL
27	V	BRAKE FLUID LEVEL SWITCH SIGNAL
28	R	ROOF STATUS SIGNAL
29	R	WASHER LEVEL SWITCH SIGNAL
30	P	VEHICLE SPEED SIGNAL (2-PULSE)
31	V	VEHICLE SPEED SIGNAL (8-PULSE)
32	LG	OVERDRIVE CONTROL SWITCH SIGNAL
34	G	FUEL LEVEL SENSOR SIGNAL
35	SB	SEAT BELT BUCKLE SWITCH SIGNAL (DRIVER SIDE)
36	R	SEAT BELT BUCKLE SWITCH SIGNAL (PASSENGER SIDE)

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WIPER AND WASHER SYSTEM

< WIRING DIAGRAM >

FRONT WIPER AND WASHER SYSTEM

Connector No.	M103
Connector Name	COMBINATION SWITCH
Connector Type	TH16FW-NH



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 [Specification]
1	G	FR WASH MOTOR
2	Y	OUTPUT 4
3	V	OUTPUT 3
4	B	GND
5	GR	INPUT 3
6	L	OUTPUT 5
7	SB	INPUT 2
8	P	INPUT 4
9	O	INPUT 1
10	W	OUTPUT 1
11	R	INPUT 5
12	P	OUTPUT 2

Connector No.	M118
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	M03FB-LG



1	2	3
---	---	---

Terminal No.	Color of Wire	Signal Name [Specification]
1	W	BAT (F/L)
2	GR	POWER WINDOW POWER SUPPLY (BAT)
3	L	POWER WINDOW POWER SUPPLY (RAP)

Connector No.	M119
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	NS16FW-CS



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 [Specification]
4	P	INTERIOR ROOM LAMP POWER SUPPLY
5	G	PASSENGER DOOR UNLOCK OUTPUT
6	W	STEP LAMP OUTPUT
7	V	ALL DOOR FUEL LID LOCK OUTPUT
8	G	DRIVER DOOR UNLOCK OUTPUT
9	LG	BAT (FUSE)
10	B	GND
11	O	PUSH BUTTON IGNITION SW ILL GND
12	L	ACC IND
13	G	TURN SIGNAL RH
14	BR	TURN SIGNAL LH
15	G	ROOM LAMP TIMER CONTROL

Connector No.	M122
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FB-NH



91	90	89	88	87	86	85	84	83	82	81	80	79	78	77	76	75	74	73	72
111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	96	95	94	93	92

Terminal No.	Color of Wire	Signal Name [Specification]
72	B	ROOM ANT 2-
73	W	ROOM ANT 2+
74	Y	PASSENGER DOOR ANT-
75	LG	PASSENGER DOOR ANT+
76	V	DRIVER DOOR ANT-
77	P	DRIVER DOOR ANT+
80	SB	IMMOBI ANTENNA CONTROL
81	O	IMMOBI ANTENNA SIGNAL
82	BR	IGN RELAY (F/B) CONT
83	P	KEYLESS ENTRY RECEIVER SIGNAL

87	R	COMBI SW INPUT 5
88	GR	COMBI SW INPUT 3
89	P	CAN-H
90	L	CAN-L
91	R	KEY SLOT ILL
92	P	ON IND
93	L	ACC RELAY CONT
94	Y	CVT SHIFT SELECTOR POWER SUPPLY
95	V	SHIFT P
96	P	PASSENGER DOOR REQUEST SW
97	W	DRIVER DOOR REQUEST SW
98	L	BLOWER FAN MOTOR RELAY CONT
99	Y	KEYLESS ENTRY RECEIVER POWER SUPPLY
100	L	KYLS ENT RECEIVER (REAR) PWR SUPPLY
101	O	COMBI SW INPUT 1
102	P	COMBI SW INPUT 4
103	SB	COMBI SW INPUT 2
104	G	HAZARD SW

Connector No.	M123
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FG-NH



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	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	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166
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WIPER AND WASHER SYSTEM

< WIRING DIAGRAM >

FRONT WIPER AND WASHER SYSTEM

Connector No.	M174
Connector Name	AV CONTROL UNIT
Connector Type	TH2FW-NH



76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27

Terminal No.	Color of Wire	Signal Name [Specification]
76	L	AV COMM (L)
77	G	AV COMM (H)
78	L	AV COMM (L)
79	G	AV COMM (H)
80	P	CAN-L
81	L	CAN-H
82	V	SW GND
86	SHIELD	SHIELD
87	R	TEL VOICE SIGNAL (+)
88	L	TEL VOICE SIGNAL (-)
92	V	VEHICLE SPEED SIGNAL (8-PULSE)
93	G	PARKING BRAKE
94	R	REVERSE
95	G	IGNITION
96	W	DISK EJECT SIGNAL
102	W	AUX SOUND SIGNAL GND
103	B	AUX SOUND SIGNAL LH (+)
104	R	AUX SOUND SIGNAL RH (+)

Connector No.	M180
Connector Name	AV CONTROL UNIT
Connector Type	TH2FW-NH



65	66	67	68	69	70	71	72	73	74	75	76
11	12	13	14	15	16	17	18	19	20	21	22

Terminal No.	Color of Wire	Signal Name [Specification]
65	G	PARKING BRAKE
67	V	COMPOSITE IMAGE SIGNAL GND
68	G	COMPOSITE IMAGE SIGNAL
71	SHIELD	SHIELD

72	B	MICROPHONE YGC
73	V	COMM (CONT->DISP)
74	P	CAN-L
75	L	AV COMM (L)
76	L	AV COMM (L)
79	R	ILLUMINATION SIGNAL
80	G	IGNITION
81	R	REVERSE
82	V	VEHICLE SPEED SIGNAL (8-PULSE)
83	SHIELD	SHIELD
87	W	MICROPHONE SIGNAL
88	SHIELD	SHIELD
89	G	COMM (DISP->CONT)
90	L	CAN-H
91	R	AV COMM (H)
92	R	AV COMM (H)

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

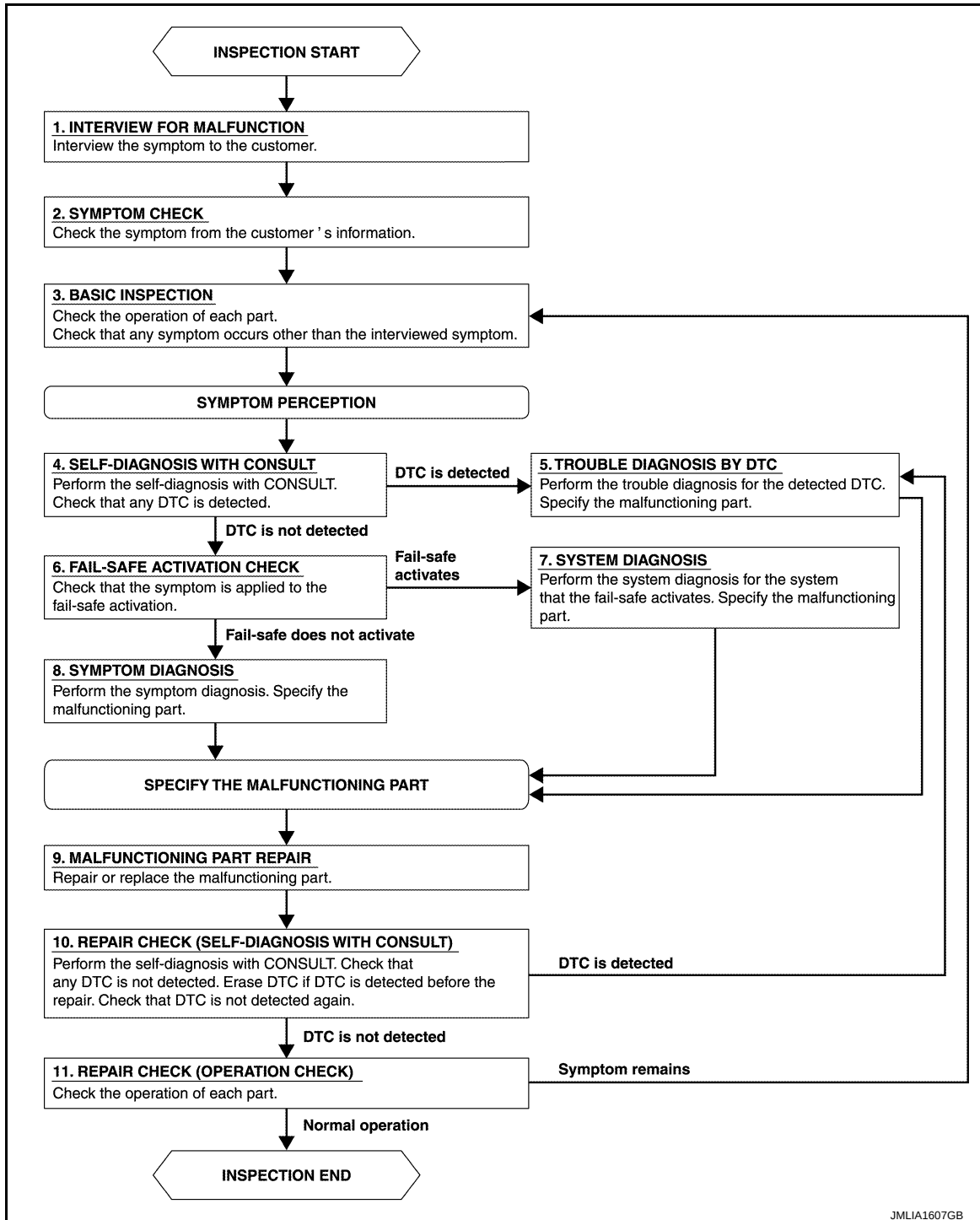
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000007238346

OVERALL SEQUENCE



DETAILED FLOW

1. INTERVIEW FOR MALFUNCTION

Interview the symptom to the customer.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

>> GO TO 2.

2. SYMPTOM CHECK

Check the symptom from the customer's information.

>> GO TO 3.

3. BASIC INSPECTION

Check the operation of each part. Check that any symptom occurs other than the interviewed symptom.

>> GO TO 4.

4. SELF-DIAGNOSIS WITH CONSULT

Perform the self-diagnosis with CONSULT. Check that any DTC is detected.

Is any DTC detected?

YES >> GO TO 5.

NO >> GO TO 6.

5. TROUBLE DIAGNOSIS BY DTC

Perform the trouble diagnosis for the detected DTC. Specify the malfunctioning part.

>> GO TO 9.

6. FAIL-SAFE ACTIVATION CHECK

Check that the symptom is applied to the fail-safe activation.

Does the fail-safe activate?

YES >> GO TO 7.

NO >> GO TO 8.

7. SYSTEM DIAGNOSIS

Perform the system diagnosis for the system that the fail-safe activates. Specify the malfunctioning part.

>> GO TO 9.

8. SYMPTOM DIAGNOSIS

Perform the symptom diagnosis. Specify the malfunctioning part.

>> GO TO 9.

9. MALFUNCTION PART REPAIR

Repair or replace the malfunctioning part.

>> GO TO 10.

10. REPAIR CHECK (SELF-DIAGNOSIS WITH CONSULT)

Perform the 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 11.

11. REPAIR CHECK (OPERATION CHECK)

Check the operation of each part.

Does it operate normally?

YES >> INSPECTION END

NO >> GO TO 3.

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FRONT WIPER MOTOR LO CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS

FRONT WIPER MOTOR LO CIRCUIT

Component Function Check

INFOID:000000007238348

1.CHECK FRONT WIPER LO OPERATION

CONSULT ACTIVE TEST

1. Select "FRONT WIPER" of IPDM E/R active test item.
2. With operating the test item, check front wiper operation.

Lo : Front wiper (LO) operation

Off : Stop the front wiper.

Is front wiper (LO) operation normally?

- YES >> Front wiper motor LO circuit is normal.
NO >> Refer to [WW-26, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000007238349

1.CHECK FRONT WIPER MOTOR (LO) OUTPUT VOLTAGE

CONSULT ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front wiper motor connector.
3. Turn ignition switch ON.
4. Select "FRONT WIPER" of IPDM E/R active test item.
5. With operating the test item, check voltage between front wiper motor harness connector and ground.

(+)		(−)	Condition		Voltage (Approx.)
Front wiper motor					
Connector	Terminal				
E12	1	Ground	FRONT WIPER	Lo	Battery voltage
				Off	0 V

Is the inspection result normal?

- YES >> Replace front wiper motor.
NO >> GO TO 2.

2.CHECK FRONT WIPER MOTOR (LO) CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front wiper motor harness connector.

IPDM E/R		Front wiper motor		Continuity
Connector	Terminal	Connector	Terminal	
E10	4	E12	1	Existed

4. Check continuity between IPDM E/R harness connector and ground.

IPDM E/R		Ground	Continuity
Connector	Terminal		
E10	4		Not existed

Is the inspection result normal?

- YES >> Replace IPDM E/R.
NO >> Repair or replace harness.

FRONT WIPER MOTOR HI CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

FRONT WIPER MOTOR HI CIRCUIT

Component Function Check

INFOID:000000007238350

1.CHECK FRONT WIPER HI OPERATION

CONSULT ACTIVE TEST

1. Select "FRONT WIPER" of IPDM E/R active test item.
2. With operating the test item, check front wiper operation.

Hi : Front wiper (HI) operation

Off : Stop the front wiper.

Is front wiper (HI) operation normally?

- YES >> Front wiper motor HI circuit is normal.
NO >> Refer to [WW-27, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000007238351

1.CHECK FRONT WIPER MOTOR (HI) OUTPUT VOLTAGE

CONSULT ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front wiper motor connector.
3. Turn ignition switch ON.
4. Select "FRONT WIPER" of IPDM E/R active test item.
5. With operating the test item, check voltage between front wiper motor harness connector and ground.

(+)		(-)	Condition		Voltage (Approx.)
Front wiper motor					
Connector	Terminal				
E12	4	Ground	FRONT WIPER	Hi	Battery voltage
				Off	0 V

Is the inspection result normal?

- YES >> Replace front wiper motor.
NO >> GO TO 2.

2.CHECK FRONT WIPER MOTOR (HI) CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front wiper motor harness connector.

IPDM E/R		Front wiper motor		Continuity
Connector	Terminal	Connector	Terminal	
E10	5	E12	4	Existed

4. Check continuity between IPDM E/R harness connector and ground.

IPDM E/R		Ground	Continuity
Connector	Terminal		
E10	5		Not existed

Is the inspection result normal?

- YES >> Replace IPDM E/R.
NO >> Repair or replace harness.

FRONT WIPER AUTO STOP SIGNAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

FRONT WIPER AUTO STOP SIGNAL CIRCUIT

Component Function Check

INFOID:000000007238352

1.CHECK FRONT WIPER (AUTO STOP) SIGNAL

CONSULT DATA MONITOR

1. Select "WIP AUTO STOP" of IPDM E/R data monitor item.
2. Operate the front wiper.
3. With the front wiper operation, check the monitor status.

Monitor item	Condition		Monitor status
WIP AUTO STOP	Front wiper motor	Stop position	STOP P
		Except stop position	ACT P

Is the status of item normal?

- YES >> Auto stop signal circuit is normal.
NO >> Refer to [WW-28, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000007238353

1.CHECK IPDM E/R OUTPUT VOLTAGE

1. Turn ignition switch OFF.
2. Disconnect front wiper motor connector.
3. Turn ignition switch ON.
4. Check voltage between front wiper motor harness connector and ground.

(+)		(-)	Voltage (Approx.)
Front wiper motor			
Connector	Terminal		
E12	5	Ground	Battery voltage

Is the inspection result normal?

- YES >> Replace front wiper motor.
NO >> GO TO 2.

2.CHECK FRONT WIPER MOTOR (AUTO STOP) CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector and front wiper motor harness connector.

IPDM E/R		Front wiper motor		Continuity
Connector	Terminal	Connector	Terminal	
E10	16	E12	5	Existed

4. Check continuity between IPDM E/R harness connector and ground.

IPDM E/R		Ground	Continuity
Connector	Terminal		
E10	16	Ground	Not existed

Is the inspection result normal?

- YES >> Replace IPDM E/R.
NO >> Repair or replace harness.

FRONT WIPER MOTOR GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

FRONT WIPER MOTOR GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000007238354

1.CHECK FRONT WIPER MOTOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front wiper motor connector.
3. Check continuity between front wiper motor harness connector and ground.

Front wiper motor		Ground	Continuity
Connector	Terminal		
E12	2		Existed

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Repair or replace harness.

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WW

WASHER SWITCH

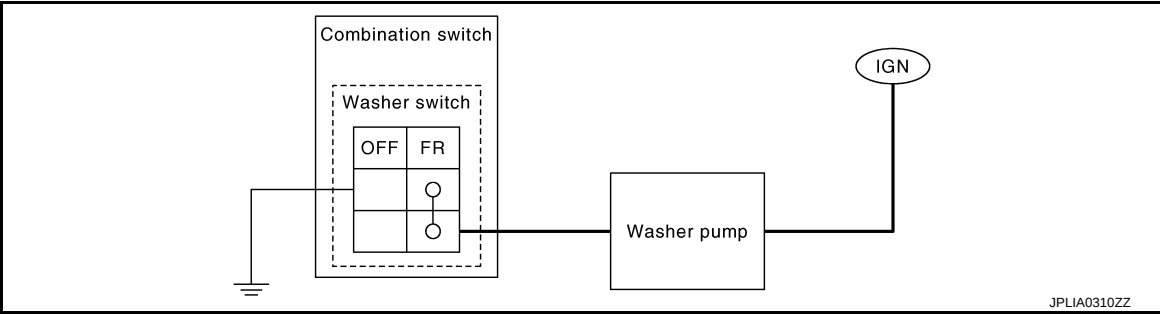
< DTC/CIRCUIT DIAGNOSIS >

WASHER SWITCH

Description

INFOID:000000007263538

Washer switch is integrated with combination switch.



Component Inspection

INFOID:000000007263539

1. CHECK WIPER SWITCH

1. Turn the ignition switch OFF.
2. Disconnect combination switch connector.
3. Check continuity between the combination switch terminals.

Combination switch		Condition	Continuity
Terminal			
1	6	Front washer switch ON	Existed

Does continuity exist?

- YES >> Wiper and washer switch is normal.
NO >> Replace wiper and washer switch.

WIPER AND WASHER SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

WIPER AND WASHER SYSTEM SYMPTOMS

Symptom Table

INFOID:000000007238361

Symptom		Probable malfunction location	Inspection item
Front wiper does not operate	HI only	- Combination switch - Harness between combination switch and BCM - BCM	Combination switch Refer to BCS-76, "Symptom Table" .
		- IPDM E/R - Harness between IPDM E/R and front wiper motor - Front wiper motor	Front wiper motor (HI) circuit Refer to WW-27, "Component Function Check" .
		Front wiper request signal - BCM - IPDM E/R	IPDM E/R Data monitor "FR WIP REQ"
	LO and INT	- Combination switch - Harness between combination switch and BCM - BCM	Combination switch Refer to BCS-76, "Symptom Table" .
		- IPDM E/R - Harness between IPDM E/R and front wiper motor - Front wiper motor	Front wiper motor (LO) circuit Refer to WW-26, "Component Function Check" .
		Front wiper request signal - BCM - IPDM E/R	IPDM E/R Data monitor "FR WIP REQ"
	INT only	- Combination switch - Harness between combination switch and BCM - BCM	Combination switch Refer to BCS-76, "Symptom Table" .
		Front wiper request signal - BCM - IPDM E/R	IPDM E/R Data monitor "FR WIP REQ"
	HI, LO and INT	SYMPTOM DIAGNOSIS Refer to WW-34, "Diagnosis Procedure" .	
Front wiper does not stop	HI only	- Combination switch - BCM	Combination switch Refer to BCS-76, "Symptom Table" .
		Front wiper request signal - BCM - IPDM E/R	IPDM E/R Data monitor "FR WIP REQ"
		IPDM E/R	—
	LO only	- Combination switch - BCM	Combination switch Refer to BCS-76, "Symptom Table" .
		Front wiper request signal - BCM - IPDM E/R	IPDM E/R Data monitor "FR WIP REQ"
		IPDM E/R	—
	INT only	- Combination switch - BCM	Combination switch refer to BCS-76, "Symptom Table" .
		Front wiper request signal - BCM - IPDM E/R	IPDM E/R Data monitor "FR WIP REQ"

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WIPER AND WASHER SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

Symptom		Probable malfunction location	Inspection item
Front wiper does not operate normally	Intermittent adjustment cannot be performed	- Combination switch - Harness between combination switch and BCM - BCM	Combination switch Refer to BCS-76, "Symptom Table" .
		BCM	—
	Intermittent control linked with vehicle speed cannot be performed	Check the wiper setting is linked with vehicle speed. Refer to WW-11, "WIPER : CONSULT Function - WIPER" .	
	Service positioning operation does not operate	- Combination switch - BCM - IPDM E/R	Combination switch Refer to BCS-76, "Symptom Table" .
	Wiper is not linked to the washer operation	- Combination switch - Harness between combination switch and BCM - BCM	Combination switch Refer to BCS-76, "Symptom Table" .
		BCM	—
	Does not return to stop position [Repeatedly operates for 10 seconds and then stops for 20 seconds. After that, it stops the operation. (Fail-safe)]	- IPDM E/R - Harness between IPDM E/R and front wiper motor - Front wiper motor	Front wiper auto stop signal circuit Refer to WW-28, "Component Function Check" .

NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description

INFOID:000000007238362

FRONT WIPER MOTOR PROTECTION FUNCTION

- IPDM E/R may stop the front wiper to protect the front wiper motor if any obstruction (operation resistance) such as a large amount of snow is detected during the front wiper operation.
- At that time turn OFF the front wiper and remove the foreign object. Then wait for approximately 20 seconds or more and reactivate the front wiper. The wiper will operate normally.

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FRONT WIPER DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

FRONT WIPER DOES NOT OPERATE

Description

INFOID:000000007238363

The front wiper does not operate under any operation conditions.

Diagnosis Procedure

INFOID:000000007238364

1.CHECK WIPER RELAY OPERATION

CONSULT ACTIVE TEST

1. Select "FRONT WIPER" of IPDM E/R active test item.
2. With operating the test item, check front wiper operation.

Lo : Front wiper LO operation

Hi : Front wiper HI operation

Off : Stop the front wiper.

Is front wiper operation normally?

YES >> GO TO 5.

NO >> GO TO 2.

2.CHECK FRONT WIPER MOTOR FUSE

Check that the following fuses is not fusing.

Unit	Location	No.	Capacity
Front wiper motor	IPDM E/R	60	30 A
Washer pump		47	10 A

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace the fuse after repairing the applicable circuit.

3.CHECK FRONT WIPER MOTOR GROUND CIRCUIT

Check front wiper motor ground circuit. Refer to [WW-29, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace harness.

4.CHECK FRONT WIPER MOTOR INPUT VOLTAGE

CONSULT ACTIVE TEST

1. Turn ignition switch OFF.
2. Disconnect front wiper motor connector.
3. Turn ignition switch ON.
4. Select "FRONT WIPER" of IPDM E/R active test item.
5. With operating the test item, check voltage between front wiper motor harness connector and ground.

(+)		(-)	Condition		Voltage (Approx.)
Front wiper motor					
Connector	Terminal				
E12	1	Ground	FRONT WIPER	Lo	Battery voltage
				Off	0 V
	4			Hi	Battery voltage
				Off	0 V

Is the inspection result normal?

YES >> Replace front wiper motor.

NO >> Replace IPDM E/R.

FRONT WIPER DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

5.CHECK FRONT WIPER REQUEST SIGNAL INPUT

CONSULT DATA MONITOR

1. Select "FR WIP REQ" of IPDM E/R data monitor item.
2. Switch the front wiper switch to HI and LO.
3. With operating the front wiper switch, check the status of "FR WIP REQ".

Monitor item	Condition		Monitor status
FR WIP REQ	Front wiper switch HI	On	Hi
		Off	Stop
	Front wiper switch LO	On	Low
		Off	Stop

Is the inspection result normal?

YES >> Replace IPDM E/R.

NO >> GO TO 6.

6.CHECK COMBINATION SWITCH

Perform the inspection of the combination switch. Refer to [BCS-76, "Symptom Table"](#).

Is combination switch normal?

YES >> Replace BCM. Refer to [BCS-78, "Removal and Installation"](#).

NO >> Repair or replace the applicable parts.

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WW

WASHER TANK

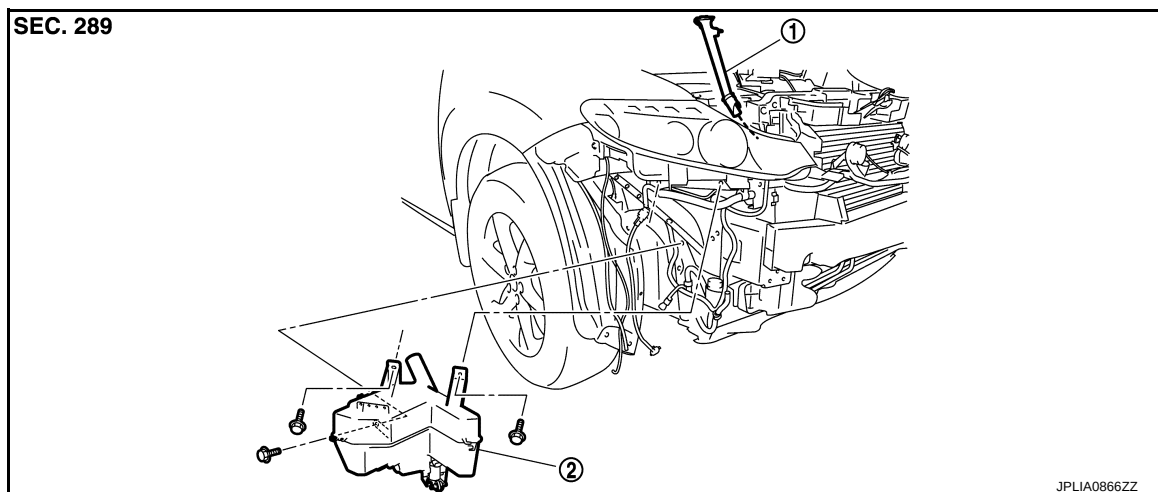
< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION

WASHER TANK

Exploded View

INFOID:000000006939358



1. Washer tank inlet

2. Washer tank

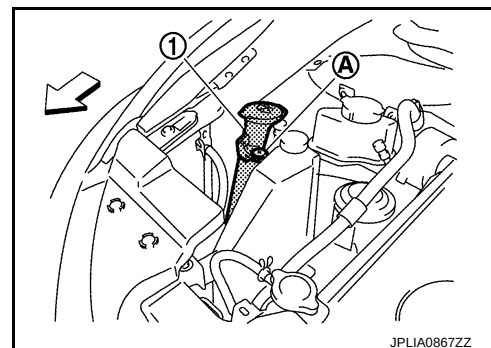
Removal and Installation

INFOID:000000006939359

REMOVAL

1. Remove the clip (A).
2. Pull out the washer tank inlet (1) from the washer tank.

↩ : Vehicle front



3. Remove the front bumper fascia. Refer to [EXT-13. "Removal and Installation"](#).
4. Disconnect washer pump connector.
5. Disconnect washer level switch connector.
6. Remove washer tube.
7. Remove washer tank mounting bolts.
8. Remove the washer tank from the vehicle.

INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION:

Add water up to the top of the washer tank inlet after installing. Check that there is no leakage.

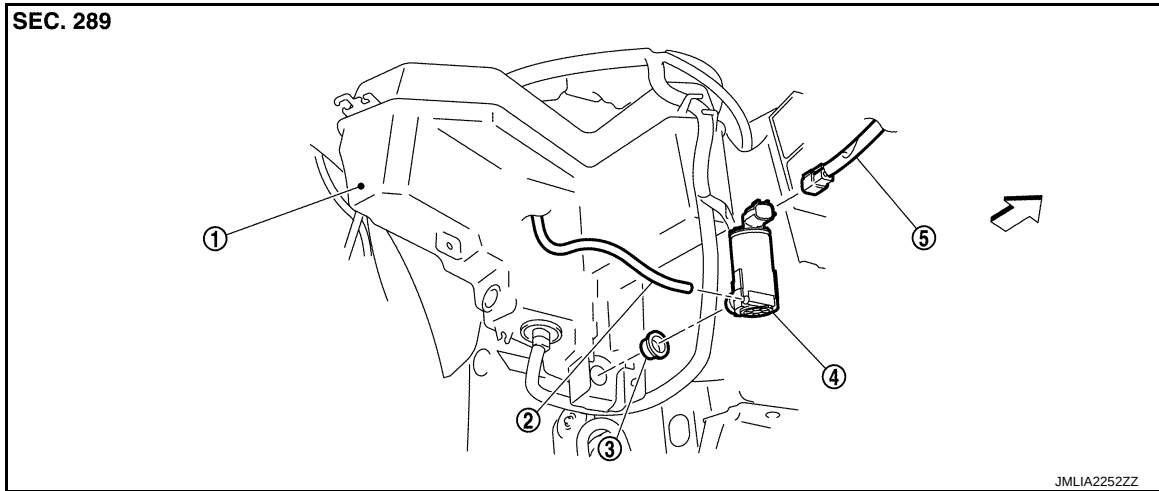
WASHER PUMP

< REMOVAL AND INSTALLATION >

WASHER PUMP

Exploded View

INFOID:000000006939360



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|----------------|----------------------------------|------------|
| 1. Washer tank | 2. Washer tube | 3. Packing |
| 4. Washer pump | 5. Washer pump harness connector | |

⇨ : Vehicle front

Removal and Installation

INFOID:000000006939361

REMOVAL

1. Remove the fender protector RH (front). Refer to [EXT-26, "FENDER PROTECTOR : Removal and Installation"](#).
2. Disconnect washer pump connector.
3. Remove washer tube.
4. Remove washer pump from the washer tank.
5. Remove the packing from the washer tank.

INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION:

Never twist the packing when installing the washer pump.

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WASHER LEVEL SWITCH

< REMOVAL AND INSTALLATION >

WASHER LEVEL SWITCH

Removal and Installation

INFOID:000000006939362

The washer level switch must be replaced together with the washer tank as an assembly. Refer to [WW-36](#), "[Removal and Installation](#)".

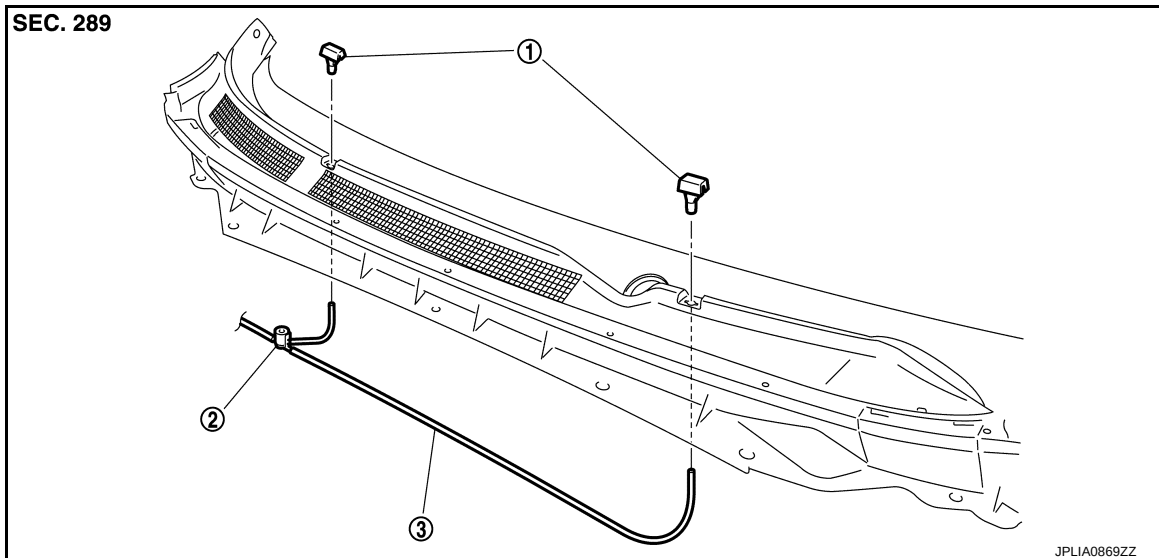
WASHER NOZZLE & TUBE

< REMOVAL AND INSTALLATION >

WASHER NOZZLE & TUBE

Exploded View

INFOID:000000006939363



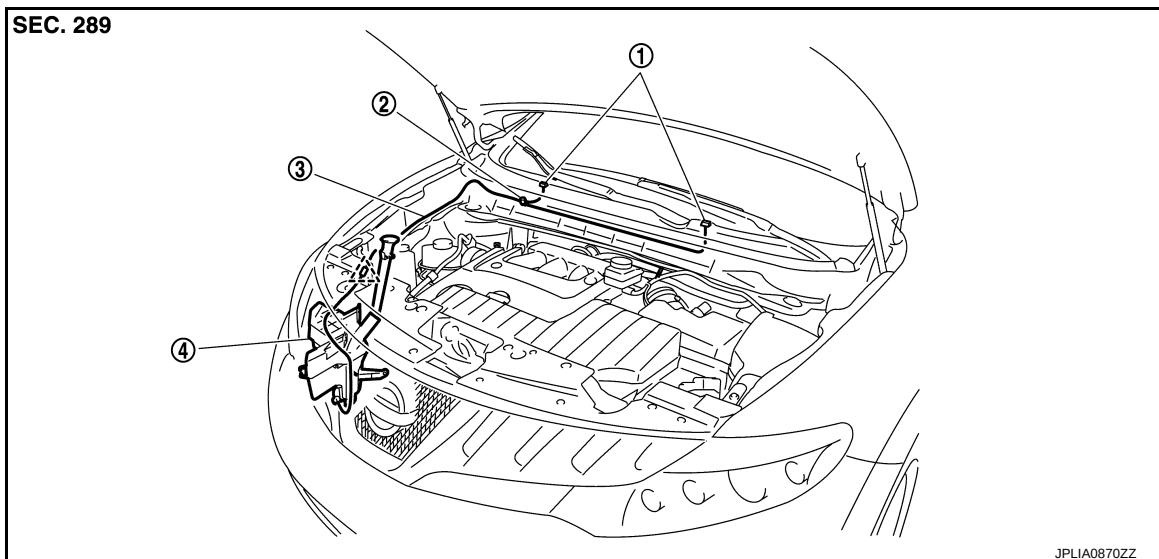
1. Front washer nozzle

2. Check valve

3. Front washer tube

Hydraulic Layout

INFOID:000000006939364



1. Front washer nozzle

2. Check valve

3. Front washer tube

4. Washer tank

△ : Clip

WASHER NOZZLE

WASHER NOZZLE : Removal and Installation

INFOID:000000006939365

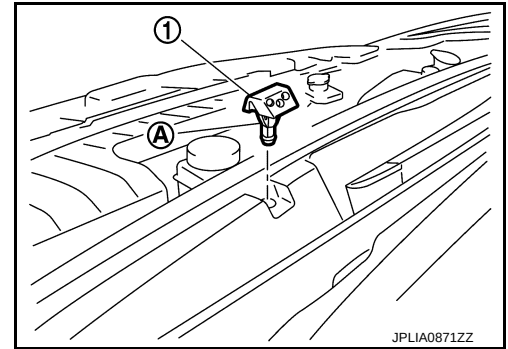
REMOVAL

1. Remove cowl top cover. Refer to [EXT-20. "Removal and Installation"](#).
2. Disconnect front washer tube from front washer nozzle.

WASHER NOZZLE & TUBE

< REMOVAL AND INSTALLATION >

- While pressing pawl (A) on the cowl top cover front side of front washer nozzle (1), remove front washer nozzle from cowl top cover.



INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION:

The spray positions differ, check that left and right nozzles are installed correctly.

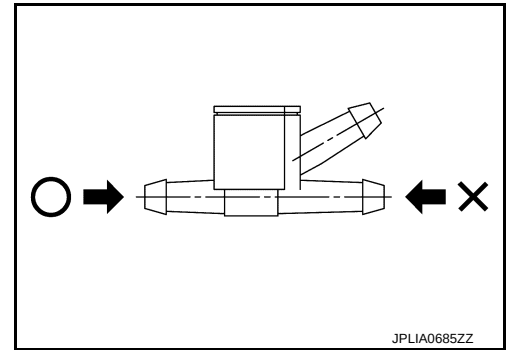
WASHER NOZZLE : Inspection and Adjustment

INFOID:000000006939366

INSPECTION

Check valve Inspection

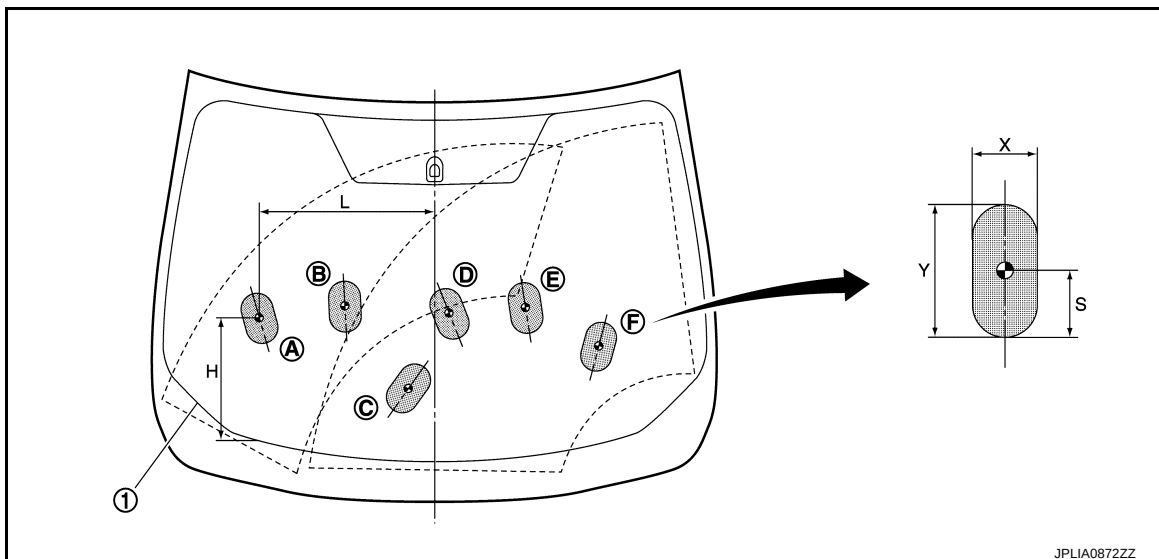
Check that air can pass through the hose by blowing forward (toward the nozzle), and check that air cannot pass through by sucking.



ADJUSTMENT

Washer Nozzle Spray Position Adjustment

Adjust spray positions to match the positions shown in the figure.



1. Black printed frame line

▨ : Spray area

● : Target spray position

WASHER NOZZLE & TUBE

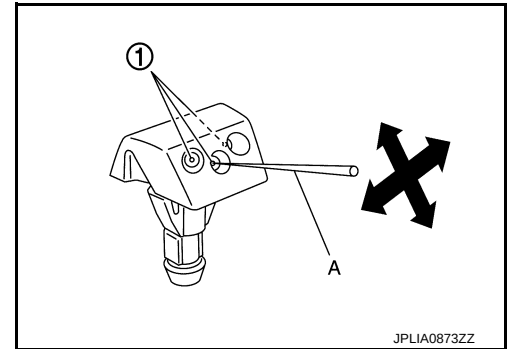
< REMOVAL AND INSTALLATION >

Unit: mm (in)					
Spray position	H	L	X	Y	S
A	285 (11.22)	429 (16.89)	80 (3.15)	130 (5.12)	65 (2.56)
B	398 (15.67)	232 (9.13)	80 (3.15)	130 (5.12)	65 (2.56)
C	185 (7.28)	69 (2.72)	80 (3.15)	130 (5.12)	65 (2.56)
D	381 (15.00)	37 (1.46)	80 (3.15)	130 (5.12)	65 (2.56)
E	398 (15.67)	232 (9.13)	80 (3.15)	130 (5.12)	65 (2.56)
F	296 (11.65)	421 (16.57)	80 (3.15)	130 (5.12)	65 (2.56)

Insert a needle or similar object (A) into the spray opening (1) and move up/down and left/right to adjust the spray position.

NOTE:

If wax or dust gets into the nozzle, remove wax or dust with a needle or small pin.



WASHER TUBE

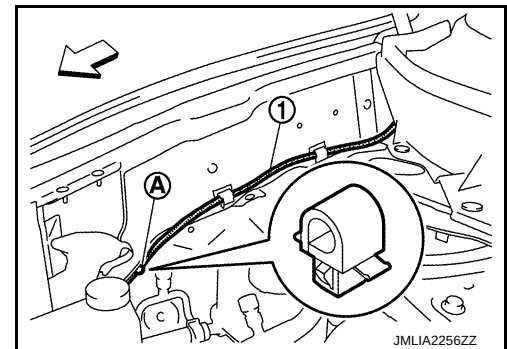
WASHER TUBE : Removal and Installation

INFOID:000000007233807

REMOVAL

1. Fully open hood.
2. Remove washer tube from the washer pump. Refer to [WW-37, "Removal and Installation"](#).
3. Remove front washer tube from the front washer nozzle. Refer to [WW-39, "WASHER NOZZLE : Removal and Installation"](#).
4. Remove front washer tube mounting clip (A). Remove front washer tube (1) from the vehicle.

← : Vehicle front



INSTALLATION

Install in the reverse order of removal.

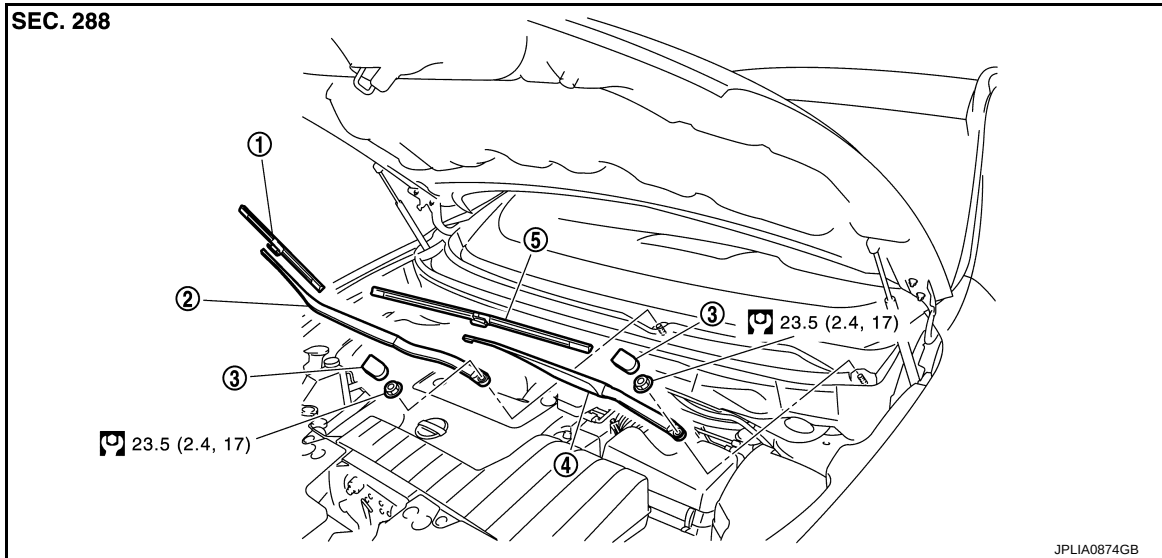
FRONT WIPER ARM

< REMOVAL AND INSTALLATION >

FRONT WIPER ARM

Exploded View

INFOID:000000006939367



- | | | |
|-------------------------|-------------------------|------------------------|
| 1. Front wiper blade RH | 2. Front wiper arm RH | 3. Front wiper arm cap |
| 4. Front wiper arm LH | 5. Front wiper blade LH | |

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

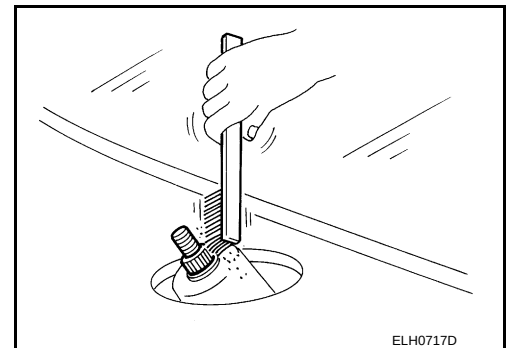
INFOID:000000006939368

REMOVAL

1. Operate the front wiper to move it to the auto stop position.
2. Fully open hood.
3. Remove front wiper arm caps.
4. Remove the front wiper arm mounting nuts.
5. Raise front wiper arm, and remove front wiper arm from the vehicle.

INSTALLATION

1. Clean wiper arm mount as shown in the figure to prevent nuts from being loosened.



2. Operate the front wiper motor to move the front wiper to the auto stop position.
3. Adjust the front wiper blade position. Refer to [WW-43, "Adjustment"](#).
4. Install the front wiper arms by tightening the mounting nuts.
5. Inject the washer fluid.
6. Operate the front wiper to move it to the auto stop position.
7. Check that the front wiper blades stop at the specified position.

FRONT WIPER ARM

< REMOVAL AND INSTALLATION >

8. Install front wiper arm caps.

Adjustment

INFOID:000000006939369

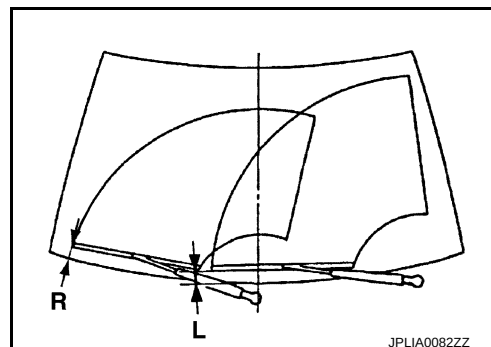
WIPER BLADE POSITION ADJUSTMENT

Clearance between the end of cowl top cover and the top of front wiper blade center

Standard clearance

R : 51.0 ± 7.5 mm (2.008 ± 0.295 in)

L : 48.0 ± 7.5 mm (1.890 ± 0.295 in)



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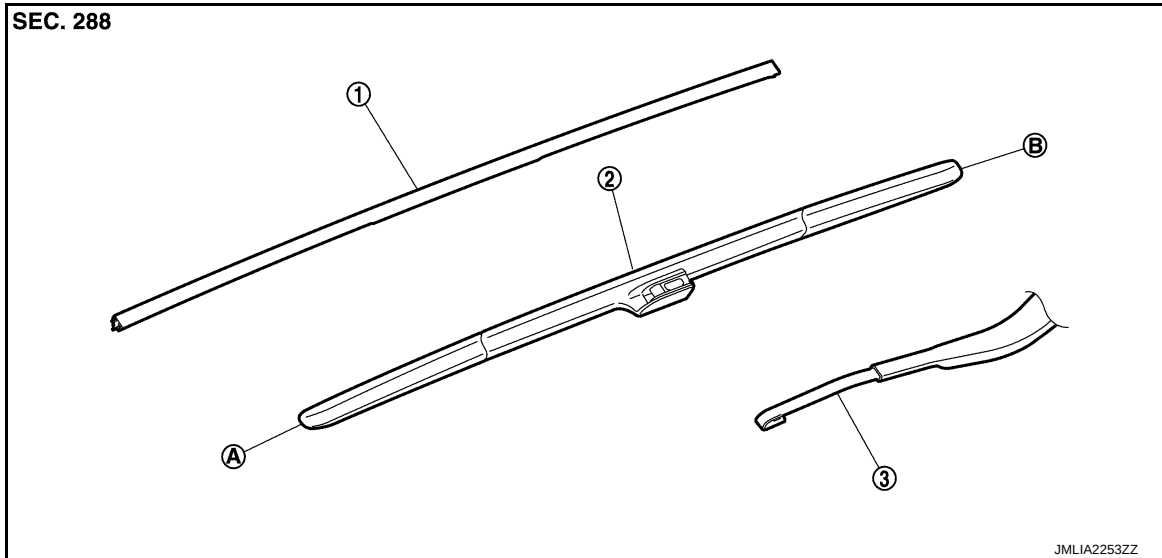
WIPER BLADE

< REMOVAL AND INSTALLATION >

WIPER BLADE

Exploded View

INFOID:000000006939370



Removal and Installation

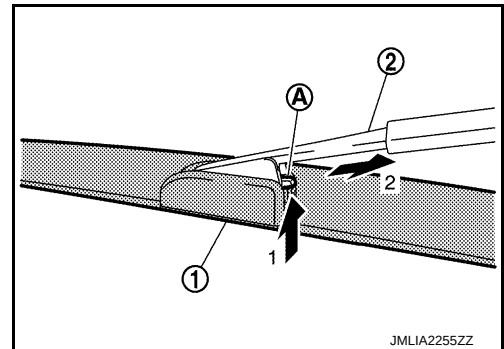
INFOID:000000006939371

REMOVAL

1. Lift up wiper arm, and set to the position where wiper arm can be locked back.
2. Press and hold lever (A) of wiper blade (1). Pull in the direction indicated by the arrow as shown in the figure, and remove wiper blade from wiper arm (2).

CAUTION:

Wrap wiper arm using a shop cloth so that wiper blade does not damage windshield glass.



INSTALLATION

Installation is the reverse order of removal.

Replacement

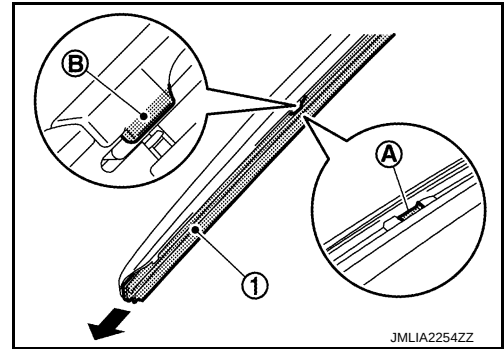
INFOID:000000006939372

1. Remove wiper blade from the wiper arm.

WIPER BLADE

< REMOVAL AND INSTALLATION >

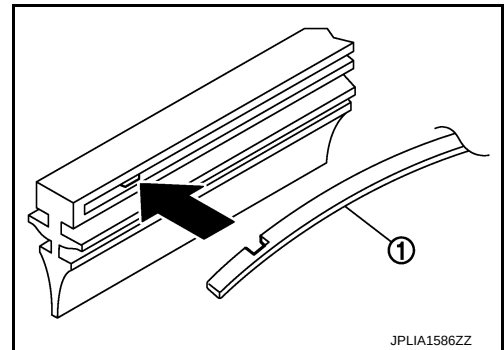
2. From portion (A) of wiper refill (1), disengage wiper blade portion (B) and remove wiper refill in the direction indicated by the arrow as shown in the figure.



NOTE:

When the vertebra is detached.

- Insert the vertebra (1) into the wiper blade to the same bending direction.
- If a vertebra has a notch, fit it to a protrusion inside the wiper refill.



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FRONT WIPER DRIVE ASSEMBLY

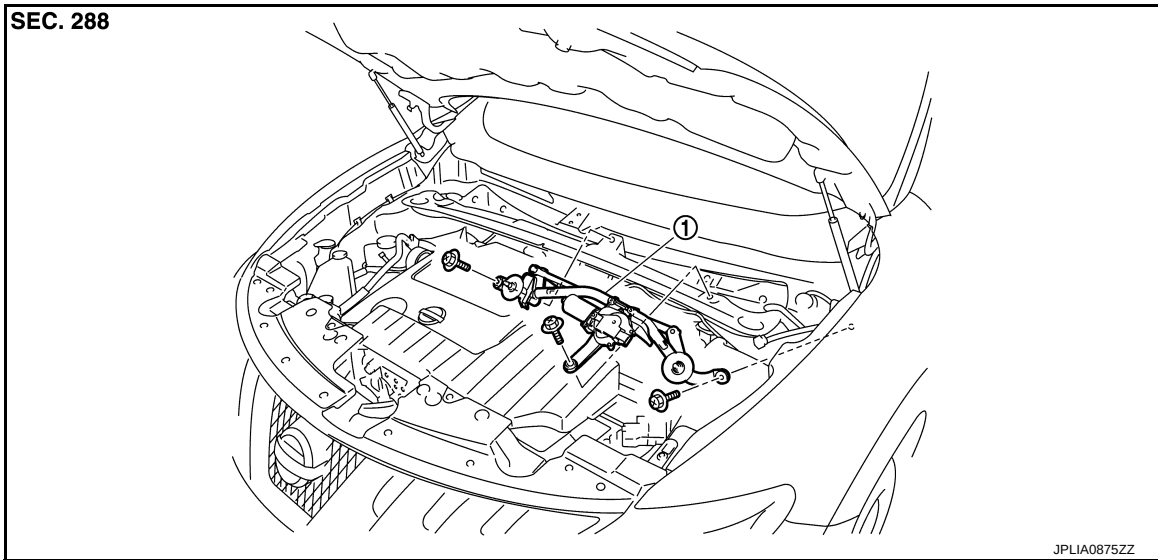
< REMOVAL AND INSTALLATION >

FRONT WIPER DRIVE ASSEMBLY

Exploded View

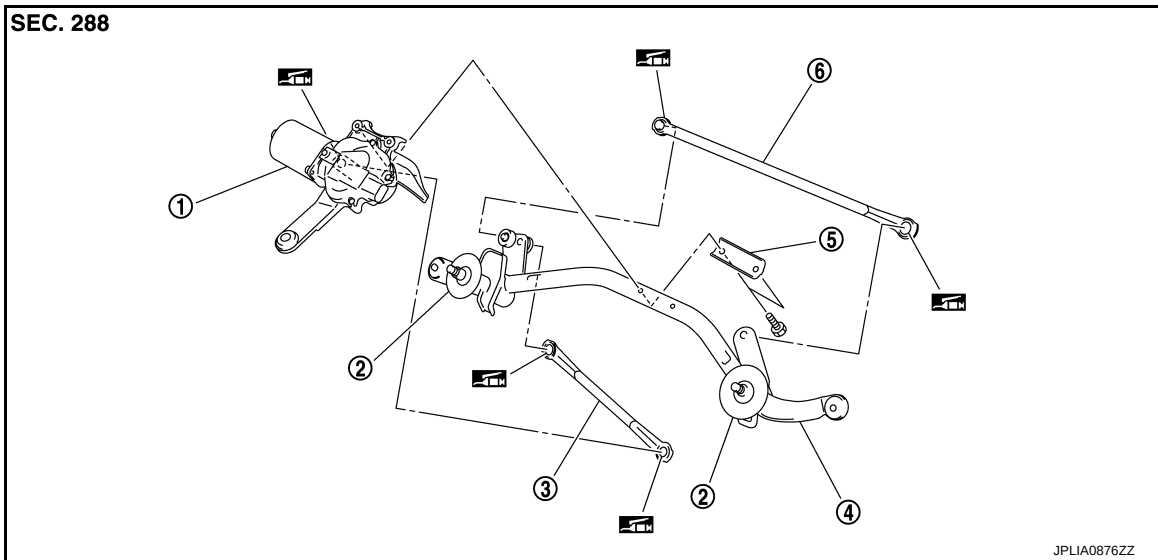
INFOID:000000006939373

REMOVAL VIEW



1. Front wiper drive assembly

DISASSEMBLY VIEW



- | | | |
|----------------------|---------------|--------------------------|
| 1. Front wiper motor | 2. Shaft seal | 3. Front wiper linkage 2 |
| 4. Front wiper frame | 5. Bracket | 6. Front wiper linkage 1 |

: Multi-purpose grease or an equivalent

Removal and Installation

INFOID:000000006939374

REMOVAL

1. Remove front wiper arm. Refer to [WW-42, "Removal and Installation"](#).
2. Remove cowl top cover. Refer to [EXT-20, "Removal and Installation"](#).
3. Remove bolts from the front wiper drive assembly.

FRONT WIPER DRIVE ASSEMBLY

< REMOVAL AND INSTALLATION >

4. Disconnect the front wiper motor connector.
5. Remove front wiper drive assembly from the vehicle.

INSTALLATION

1. Install the front wiper drive assembly to the vehicle.
2. Connect the front wiper motor connector.
3. Operate the front wiper to move it to the auto stop position.
4. Install the cowl top cover. Refer to [EXT-20, "Removal and Installation"](#).
5. Install front wiper arms. Refer to [WW-42, "Removal and Installation"](#).

Disassembly and Assembly

INFOID:000000006939375

DISASSEMBLY

1. Remove the front wiper linkage 1 and 2 from the front wiper drive assembly.
CAUTION:
Never bend the linkage or damage the plastic part of the ball joint when removing the front wiper linkage.
2. Remove the front wiper motor mounting screws, and then remove the front wiper motor from the front wiper frame.

ASSEMBLY

1. Connect the front wiper motor connector.
2. Operate the front wiper to move it to the auto stop position.
3. Disconnect the front wiper motor connector.
4. Install front wiper motor to front wiper frame.
5. Install the front wiper linkage 2 to the front wiper motor and the front wiper frame.
6. Install the front wiper linkage 1 to the front wiper frame.
CAUTION:
 - **Never drop front wiper motor or cause it to come into contact with other parts.**
 - **Be careful for the grease condition at the front wiper motor and front wiper linkage joint (retainer). Apply multi-purpose grease or an equivalent if necessary.**

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WIPER AND WASHER SWITCH

< REMOVAL AND INSTALLATION >

WIPER AND WASHER SWITCH

Exploded View

INFOID:000000006939378

Refer to [BCS-79, "Exploded View"](#).