

## 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:000000009008100

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 "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:**

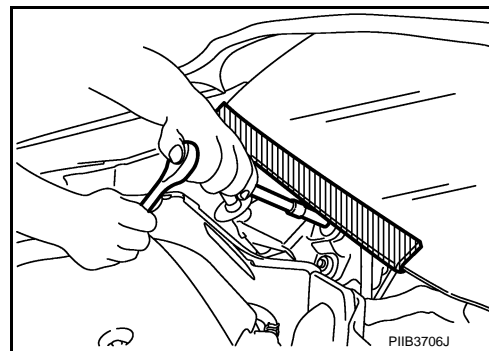
Always observe the following items for preventing accidental activation.

- 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.

#### Precaution for Procedure without Cowl Top Cover

INFOID:000000009008101

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

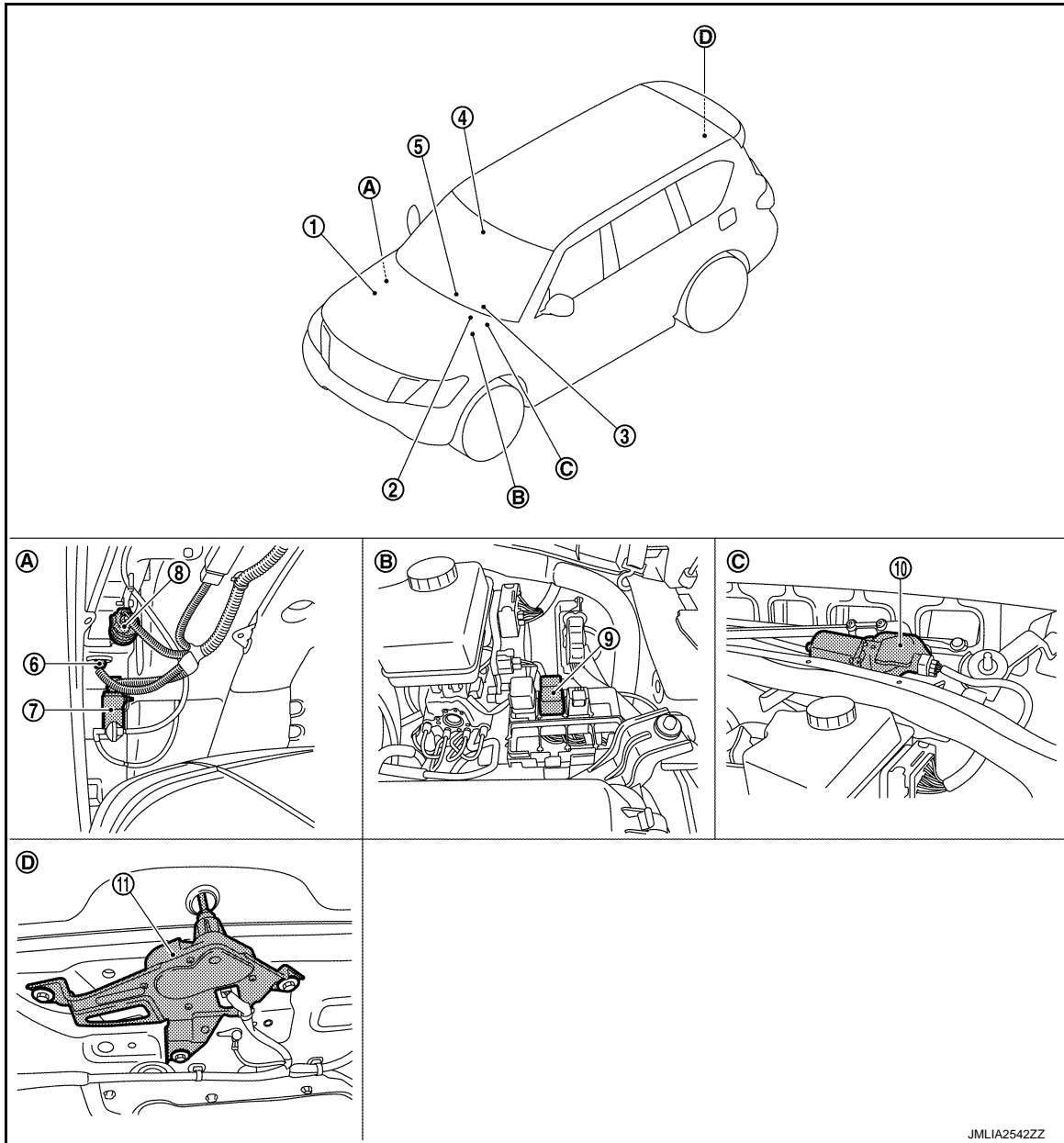
< SYSTEM DESCRIPTION >

## SYSTEM DESCRIPTION

### COMPONENT PARTS

#### Component Parts Location

INFOID:000000009008102



- |   |  |                                       |
|---|--|---------------------------------------|
| 1. IPDM E/R<br>Refer to <a href="#">PCS-4, "Component Parts Location"</a> | 2. BCM<br>Refer to <a href="#">BCS-4, "BODY CONTROL SYSTEM : Component Parts Location"</a> | 3. Combination meter                  |
| 4. Rain sensor  | 5. Combination switch  | 6. Washer level switch                |
| 7. Washer pump  | 8. Headlamp washer pump*   | 9. Headlamp washer relay*             |
| 10. Front wiper motor   | Rear wiper motor   |                                       |
| A. Behind front fender protector (RH)                                     | B. Engine room (LH)  | C. Cowl top, left side of engine room |
| D. Back door finisher inside  |  |                                       |

\*:For models with headlamp washer

# COMPONENT PARTS

< SYSTEM DESCRIPTION >

## Component Description

INFOID:000000009008103

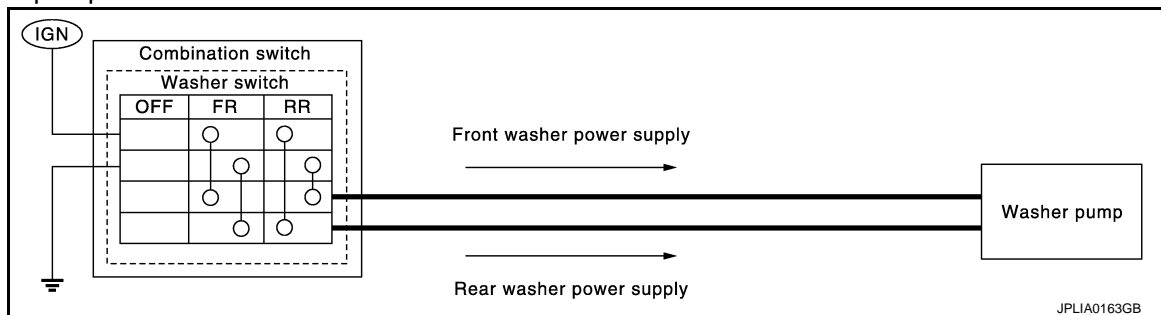
Part	Description
IPDM E/R	<ul style="list-style-type: none"> <li>Controls the integrated relay according to the request (via CAN communication) from BCM.</li> <li>Performs the auto stop control of the front wiper.</li> </ul>
BCM	<ul style="list-style-type: none"> <li>Judges each switch status by the combination switch reading function.</li> <li>Requests (via CAN communication) the front wiper relay and the front wiper high relay ON to IPDM E/R.</li> <li>Supplies power to the rear wiper motor.</li> <li>Performs the auto stop control of the rear wiper.</li> <li>Requests (via CAN communication) the headlamp washer relay ON to IPDM I/R.</li> </ul>
Rain sensor	Detects water droplets on the windshield with infrared rays, and transmits the rain sensor signal to BCM via the rain sensor serial link.
Combination switch (Wiper & washer switch)	Refer to <a href="#">BCS-8. "COMBINATION SWITCH READING SYSTEM : System Description"</a> .
Washer switch	Refer to <a href="#">WW-5. "Washer Switch"</a> .
Washer pump	<ul style="list-style-type: none"> <li>Washer fluid is sprayed according to washer switch states.</li> <li>Combination switch operates front washer or rear washer by changing voltage polarity to be supplied to washer pump.</li> </ul>
Headlamp washer pump*	Washer fluid is sprayed according to washer switch states and headlamp switch status.
Front wiper motor	<ul style="list-style-type: none"> <li>IPDM E/R controls front wiper operation.</li> <li>Front wiper stop position signal is transmitted to IPDM E/R.</li> </ul>
Rear wiper motor	<ul style="list-style-type: none"> <li>BCM controls rear wiper operation.</li> <li>Rear wiper stop position signal is transmitted to BCM.</li> </ul>
Combination meter	Transmits the vehicle speed signal to BCM via CAN communication.

\*:For models with headlamp washer

## Washer Switch

INFOID:000000009008104

- Washer switch is integrated combination switch.
- Combination switch operates front washer or rear washer by changing voltage polarity to be supplied to washer pump.



# SYSTEM

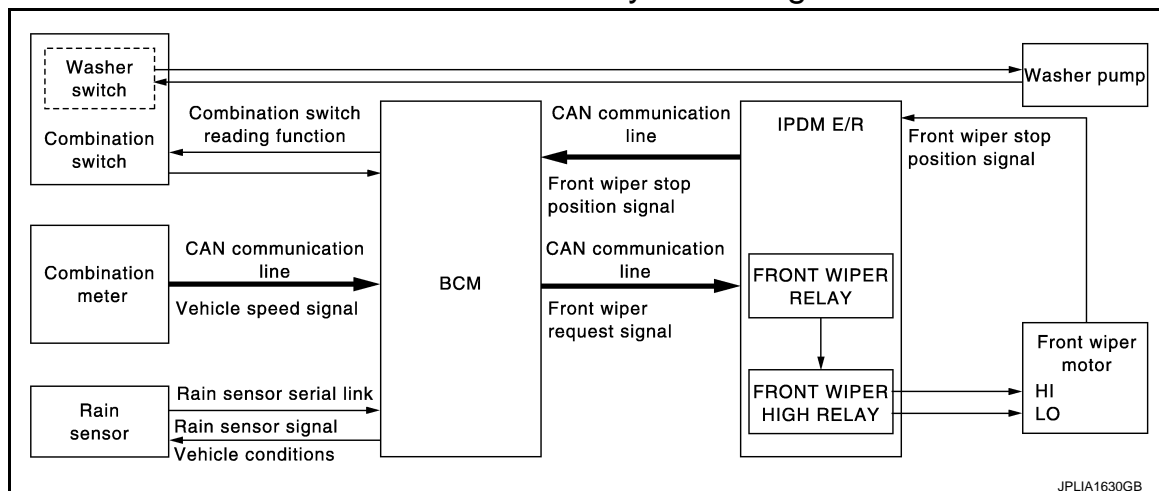
< SYSTEM DESCRIPTION >

## SYSTEM

### FRONT WIPER AND WASHER SYSTEM

#### FRONT WIPER AND WASHER SYSTEM : System Diagram

INFOID:000000009008105



#### FRONT WIPER AND WASHER SYSTEM : System Description

INFOID:000000009008106

##### 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 by the signal from the washer level switch. For details of low washer fluid warning, refer to [MWI-16, "MASTER WARNING LAMP : 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 via 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 via 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 via 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).

# SYSTEM

## < SYSTEM DESCRIPTION >

### FRONT WIPER AUTO OPERATION

#### Rain Detection

Rain level and sensor conditions are detected by rain sensor.

- BCM transmits the vehicle conditions (vehicle speed, front wiper condition, rain sensor sensitivity setting, etc.) to the rain sensor via the rain sensor serial link.
- Rain sensor judges a wiping speed for front wiper by rain condition and the vehicle conditions. And it transmits the wiping speed request signal to the BCM via the rain sensor serial link.

#### Auto Wiping Operation

- BCM receives the wiping speed request signal from the rain sensor via the rain sensor serial link.
- BCM controls front wiper operation according to the wiping speed request signals. And it transmits the front wiper request signals (LO or HI) to the IPDM E/R via CAN communication line.

#### Front wiper AUTO operating condition

- Ignition switch ON
- Front wiper switch AUTO

#### NOTE:

- When the front wiper switch is turned to AUTO position, front wiper operates once regardless of rainy conditions.
- Factory setting of the front wiper AUTO operation is operation linked with rain sensor. Front wiper AUTO operation can be set to operation linked or not linked with rain sensor using CONSULT. Refer to [WW-14, "WIPER : CONSULT Function \(BCM - WIPER\)"](#).

#### Rain Sensor Sensitivity Setting

BCM determines rain sensor sensitivity according to wiper volume dial position.

Wiper volume dial position	Sensitivity
1	High sensitivity
2	
3	
4	Medium-high sensitivity
5	
6	Low-medium sensitivity
7	
	Low sensitivity

#### NOTE:

When the wiper volume dial position is turned up by 1 level under front wiper AUTO operating condition, front wiper operates once.

#### Splash mode operation

Front wiper is operated at HI regardless of the wiper volume adjustment position, when water drops are instantaneously sprayed over the windshield glass due to water splash from oncoming vehicles or other causes. After that, AUTO operation is performed depending on the amount of water drops.

#### SPLASH MODE OPERATION CONDITIONS

- Front wiper switch AUTO
- Ignition switch ON

#### NOTE:

Splash mode is not operated and auto wiping operation is performed, while the vehicle is stopped.

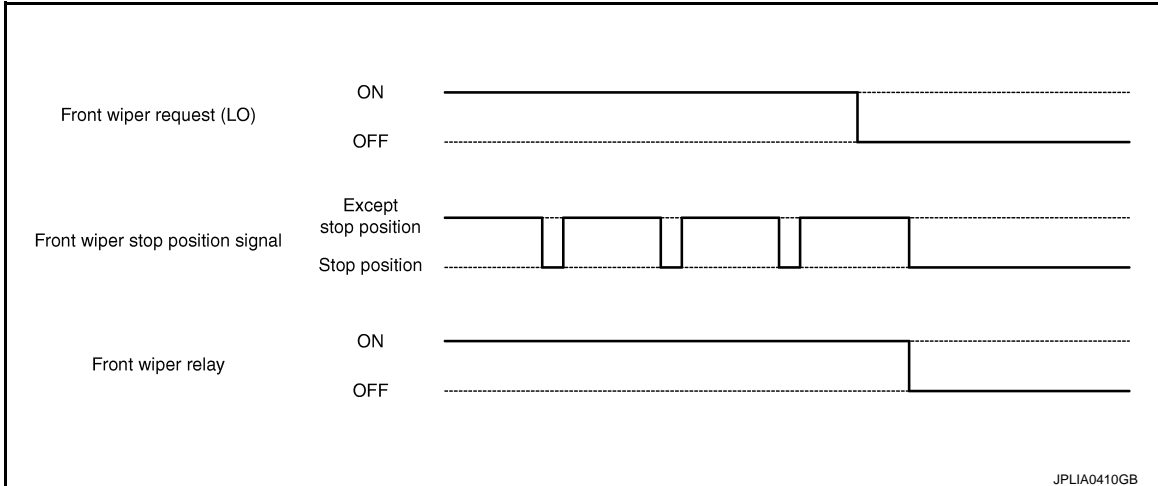
### FRONT WIPER AUTO STOP OPERATION

- 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 via 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 front washer switch ON.

### FRONT WIPER DROP WIPE OPERATION

- BCM controls the front wiper to operate once according to the conditions of front wiper drop wipe operation.

Front wiper drop wipe operating condition

- Ignition switch ON
- Front wiper switch OFF
- Front washer switch OFF
- BCM transmits the front wiper request signal (LO) to IPDM E/R with CAN communication so that the front wiper operate once three seconds after front wiper operation linked with washer.
- IPDM E/R turns ON the integrated front wiper relay according to the front wiper request signal (LO).

### NOTE:

Factory setting of the front wiper drop wipe operation is ON. Front wiper drop wipe operation can be set to ON or OFF using CONSULT. Refer to [WW-14, "WIPER : CONSULT Function \(BCM - WIPER\)"](#).

### WIPER LINKED AUTO LIGHTING FUNCTION

When light switch is in the AUTO position, front wiper operates, and then headlamp illuminates. Refer to [EXL-12, "AUTO LIGHT SYSTEM : System Description \(Except for CANADA\)"](#).

### FRONT WIPER AND WASHER SYSTEM : Fail-safe

INFOID:000000009008107

### IPDM E/R

#### IF NO CAN COMMUNICATION IS AVAILABLE WITH BCM

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.



# SYSTEM

## < SYSTEM DESCRIPTION >

Control part	Fail-safe operation
Front wiper	<ul style="list-style-type: none"> <li>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.</li> <li>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 AUTO mode and the front wiper motor is operating.</li> <li>Return 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 stops in the other position than stop position.</li> </ul>

### FRONT WIPER PROTECTION FUNCTION

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 five times.

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.

### BCM

BCM detects the rain sensor serial link error and the rain sensor malfunction.

BCM controls the following fail-safe when rain sensor has a malfunction.

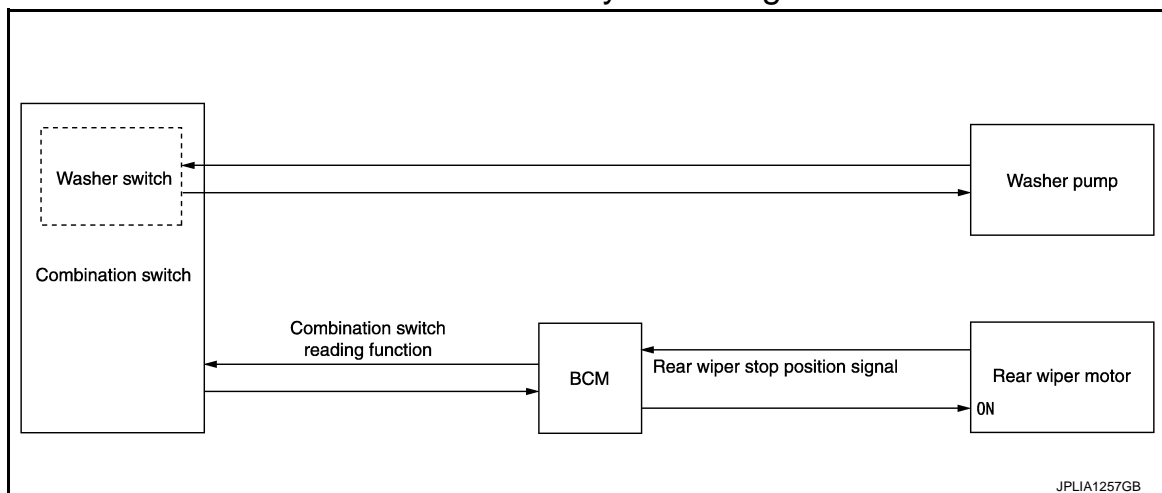
#### Fail-safe Control

- Front wiper control
  - Front wiper switch AUTO and sensing rain drop: The condition just before the activation of fail-safe is maintained until the front wiper switch is turned OFF.
  - Front wiper switch AUTO and not sensing rain drop: Front wiper is LO operation until the front wiper switch is turned off.

## REAR WIPER AND WASHER SYSTEM

### REAR WIPER AND WASHER SYSTEM : System Diagram

INFOID:0000000009008108



### REAR WIPER AND WASHER SYSTEM : System Description

INFOID:0000000009008109

### OUTLINE

The rear wiper is controlled by each function of BCM.

# SYSTEM

## < SYSTEM DESCRIPTION >

Control by BCM

- Combination switch reading function
- Rear wiper control function

### REAR WIPER BASIC OPERATION

- BCM detects the combination switch condition by the combination switch reading function.
- BCM controls the rear wiper to start or stop.

### REAR WIPER ON OPERATION

- BCM supplies power to the rear wiper motor according to the rear wiper ON operating condition.

Rear wiper ON operating condition

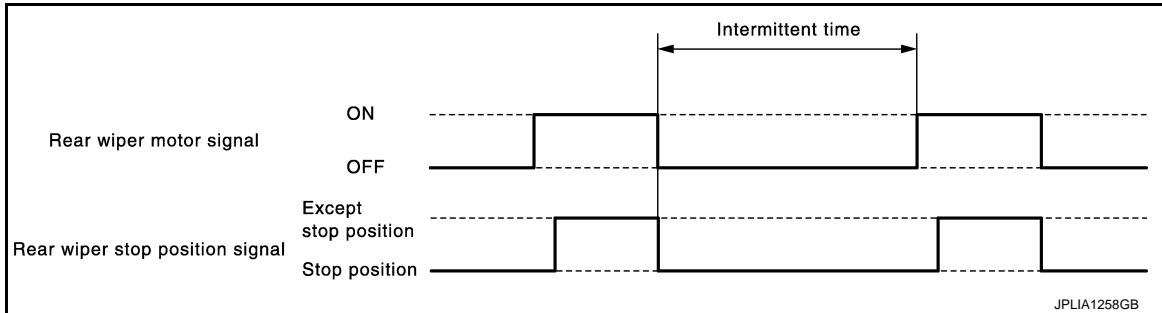
- Ignition switch ON
- Rear wiper switch ON

### REAR WIPER INT OPERATION

- BCM supplies power to the rear wiper motor according to the INT operating condition.

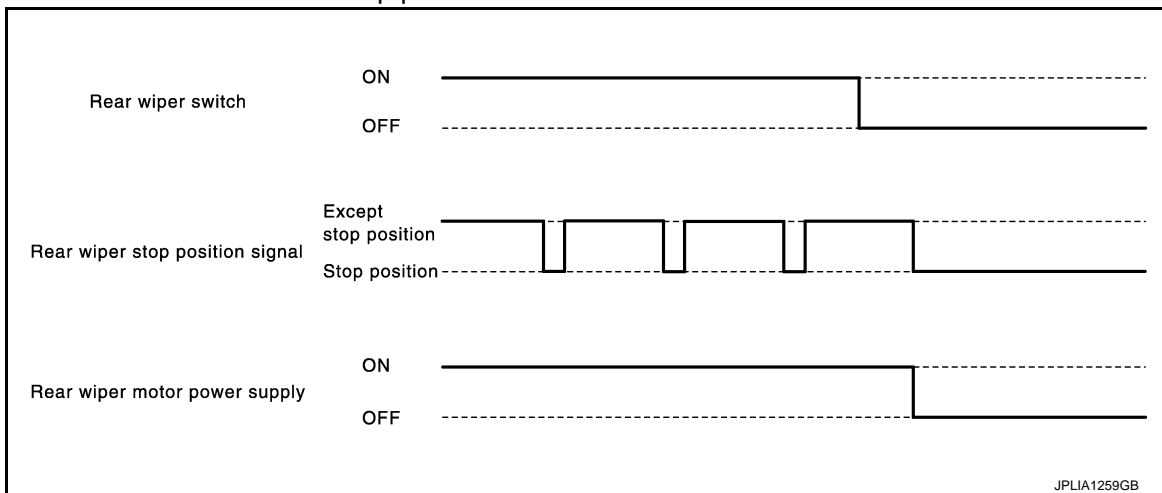
Rear wiper INT operating condition

- Ignition switch ON
- Rear wiper switch INT
- BCM controls the rear wiper to operate once.
- BCM detects the rear wiper motor stop position.
- BCM supplies power to the rear wiper motor after an intermittent from the stop of the rear wiper motor.



### REAR WIPER AUTO STOP OPERATION

- BCM stops supplying power to the rear wiper motor when the rear wiper switch is turned OFF.
- BCM reads a rear wiper stop position signal from the rear wiper motor to detect a rear wiper motor position.
- When the rear wiper motor is at other than the stop position, BCM continues to supply power to the rear wiper motor until it returns to the stop position.



#### NOTE:

BCM stops supplying power to the rear wiper motor when the ignition switch is turned OFF.

### REAR WIPER OPERATION LINKED WITH WASHER

- BCM supplies power to the rear wiper motor according to the washer linked operating condition of rear wiper. When the rear washer switch is turned OFF, BCM controls rear wiper to operate approximately 3 times.

# SYSTEM

## < SYSTEM DESCRIPTION >

Washer linked operating condition of rear wiper

- Ignition switch ON
- Rear washer switch ON (0.4 second or more)
- The washer pump is grounded through the combination switch with the rear washer switch ON.

### REAR WIPER DROP WIPE OPERATION

- BCM controls the rear wiper to operate once according to the rear wiper drop wipe operating condition.

Rear wiper drop wipe operating condition

- Ignition switch ON
- Rear wiper switch OFF
- Rear washer switch OFF
- BCM controls the rear wiper so that it operates once approximately three seconds later after the washer interlocking operation of the rear wiper.

#### NOTE:

Factory setting of the rear wiper drop wipe operation is OFF. Rear wiper drop wipe operation can be set to ON or OFF using CONSULT. Refer to [WW-14, "WIPER : CONSULT Function \(BCM - WIPER\)"](#).

### REAR WIPER AND WASHER SYSTEM : Fail Safe

INFOID:0000000009008110

### REAR WIPER MOTOR PROTECTION

BCM detects the rear wiper stop position according to the rear wiper stop position signal.

When the rear wiper stop position signal does not change for more than 5 seconds while driving the rear wiper, BCM stops power supply to protect the rear wiper motor.

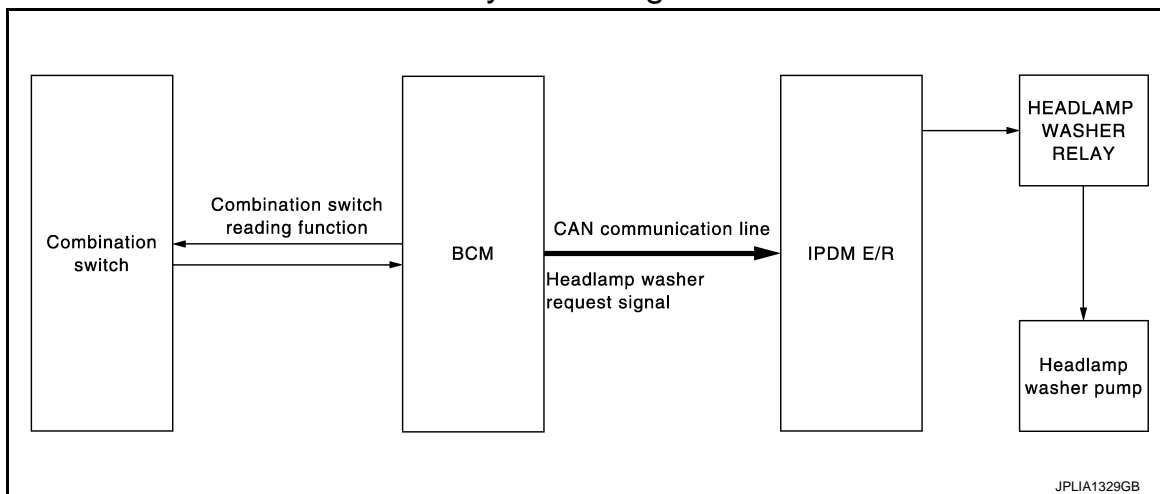
Condition of cancellation

1. More than 1 minute is passed after the rear wiper stop.
2. Turn rear wiper switch OFF.
3. Operate the rear wiper switch or rear washer switch.

### HEADLAMP WASHER SYSTEM

### HEADLAMP WASHER SYSTEM : System Diagram

INFOID:0000000009008111



### HEADLAMP WASHER SYSTEM : System Description

INFOID:0000000009008112

#### OUTLINE

Headlamp washer is controlled by each function of BCM and IPDM E/R.

Control by BCM

- Combination switch reading function
- Headlamp washer control function

Control by IPDM E/R

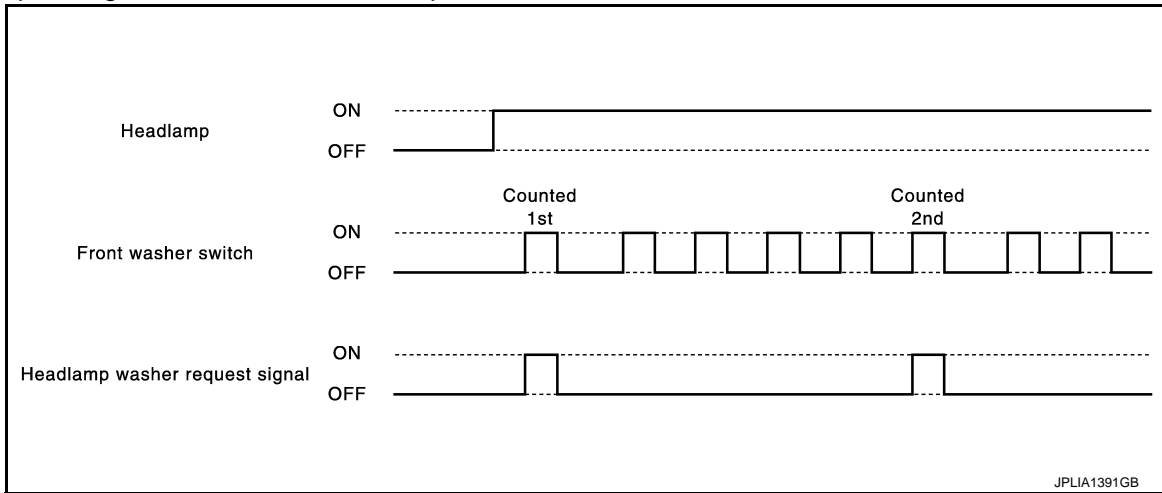
- Headlamp washer relay control function

### HEADLAMP WASHER BASIC OPERATION

# SYSTEM

## < SYSTEM DESCRIPTION >

- BCM detects the combination switch condition by the combination switch reading function.
- BCM transmits the headlamp washer request signal to IPDM E/R with CAN communication depending on each operating condition of the headlamp washer.



The operating condition to activate headlamp washer at first time

- Ignition switch ON
- Headlamps ON
- Front washer switch ON at first time

The operating condition to activate headlamp washer from the second time

- Ignition switch ON
- Headlamps ON
- Front washer switch ON at fifth time after the first time
- IPDM E/R turns ON/OFF the headlamp washer relay by receiving the headlamp washer request signal, and controls the headlamp washer.

## DIAGNOSIS SYSTEM (BCM)

### < SYSTEM DESCRIPTION >

## DIAGNOSIS SYSTEM (BCM)

### COMMON ITEM

### COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)

INFOID:000000009336401

### 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. Refer to <a href="#">BCS-57, "DTC Index"</a> .
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	<ul style="list-style-type: none"> <li>Read and save the vehicle specification.</li> <li>Write the vehicle specification when replacing BCM.</li> </ul>

### 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*		×	×
<ul style="list-style-type: none"> <li>Intelligent Key system</li> <li>Engine start system</li> </ul>	INTELLIGENT KEY	×	×	×
Combination switch	COMB SW		×	
Body control system	BCM	×		
IVIS	IMMU	×	×	×
Interior room lamp battery saver	BATTERY SAVER	×	×	×
Back door	TRUNK		×	
Vehicle security system	THEFT ALM	×	×	×
RAP system	RETAINED PWR		×	
Signal buffer system	SIGNAL BUFFER		×	×
—	AIR PRESSURE MONITOR*	×	×	×

\*: This item is indicated, but 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" (Ignition switch OFF with steering is locked.)
	OFF		Power supply position is "OFF" (Ignition switch OFF with steering is unlocked.)
	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 <ul style="list-style-type: none"> <li>• The number is 0 when a malfunction is detected now.</li> <li>• The number increases like 1 → 2 → 3...38 → 39 after returning to the normal condition whenever ignition switch OFF → ON.</li> <li>• The number is fixed to 39 until the self-diagnosis results are erased if it is over 39.</li> </ul>	

## WIPER

## WIPER : CONSULT Function (BCM - WIPER)

INFOID:000000009008114

## WORK SUPPORT

Service item	Setting item	Description	
RAIN SEN WIP FUNC SET	On*	With rain sensor (Front wiper intermittent time linked with the rain sensor, vehicle speed, and AUTO dial position)	The setting of front wiper AUTO operation can be changed
	Off	Without rain sensor (Front wiper intermittent time linked with the vehicle speed and AUTO dial position)	

# DIAGNOSIS SYSTEM (BCM)

## < SYSTEM DESCRIPTION >

Service item	Setting item	Description	
DROP WIPE FUNC SET	MODE1	Front wiper and rear wiper OFF	The setting of drop wipe operation can be changed
	MODE2*	Front wiper ON and rear wiper OFF	
	MODE3	Front wiper OFF and rear wiper ON	
	MODE4	Front wiper and rear wiper ON	

\*:Factory setting

## DATA MONITOR

### NOTE:

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

Monitor Item [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	
RR WIPER ON [Off/On]	Status of each switch judged by BCM using the combination switch reading function	
RR WIPER INT [Off/On]		
RR WASHER SW [Off/On]		
RR WIPER STOP [Off/On]	Rear wiper motor (stop position) status input from the rear wiper motor	
H/L WSR SW [Off/On]	<b>NOTE:</b> This item is indicated, but not monitored	
RAIN SENSOR [OFF/LOW/HIGH/SPLASH/NG]	Request signal from rain sensor detected by BCM is displayed	

## 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 (BCM)

### < SYSTEM DESCRIPTION >

Test item	Operation	Description
RR WIPER	On	Output the voltage to operate the rear wiper motor.
	Off	Stops the voltage to stop the rear wiper motor.
HEADLAMP WASHER*	On	Transmits the headlamp washer request signal to IPDM E/R via CAN communication to operate the headlamp washer operation.

\*: The item is displayed but not operated on models without headlamp washer.



# DIAGNOSIS SYSTEM (IPDM E/R)

< SYSTEM DESCRIPTION >

## DIAGNOSIS SYSTEM (IPDM E/R)

### Diagnosis Description

INFOID:000000009336402

### AUTO ACTIVE TEST

#### Description

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

- Oil pressure warning lamp
- Rear window defogger
- Front wiper (LO, HI)
- Parking lamp
- License plate lamp
- Tail lamp
- Side marker lamp
- Front fog lamp
- Headlamp (LO, HI)
- A/C compressor (magnet clutch)

#### Operation Procedure

##### **CAUTION:**

**Never perform auto active test in the following conditions.**

- **Engine is running.**
- **CONSULT is connected.**

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 driver door switch 10 times. Then turn the ignition switch OFF.

##### **CAUTION:**

**Close passenger door.**

4. Turn the ignition switch ON within 10 seconds. After that the horn sounds once and the auto active test starts.

##### **CAUTION:**

**Engine starts when ignition switch is turned ON while brake pedal is depressed.**

5. The oil pressure warning lamp starts blinking when the auto active test starts.
6. 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-98, "Component Function Check"](#).

#### Inspection in Auto Active Test

When auto active test is actuated, the following operation sequence is repeated 3 times.

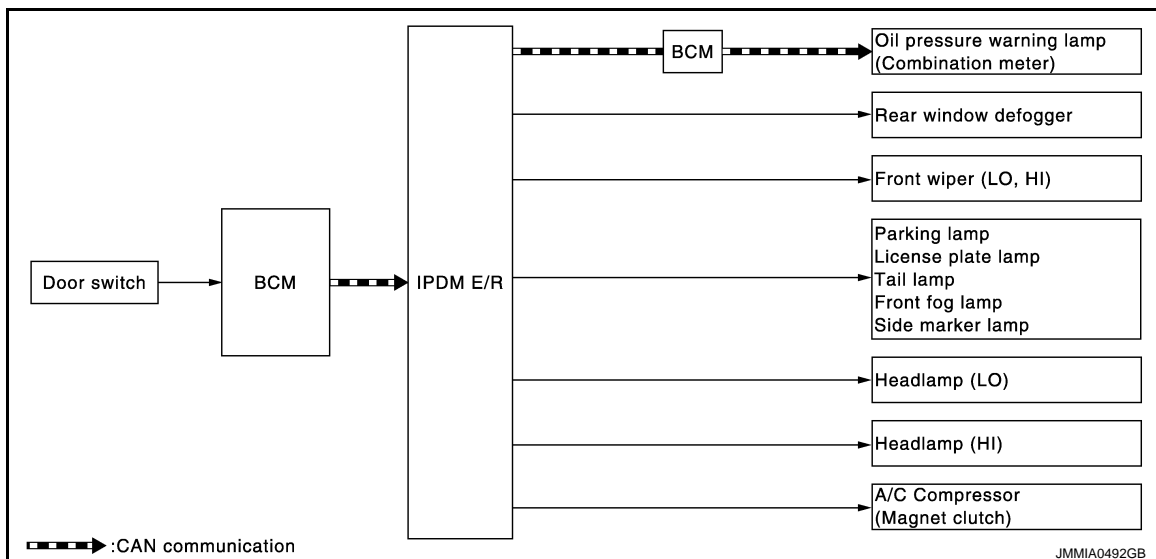
Operation sequence	Inspection location	Operation
1	Oil pressure warning lamp	Blinks continuously during operation of auto active test
2	Rear window defogger	10 seconds
3	Front wiper	LO for 5 seconds → HI for 5 seconds
4	<ul style="list-style-type: none"><li>• Parking lamp</li><li>• License plate lamp</li><li>• Tail lamp</li><li>• Side marker lamp</li><li>• Front fog lamp</li></ul>	10 seconds

# DIAGNOSIS SYSTEM (IPDM E/R)

## < SYSTEM DESCRIPTION >

Operation sequence	Inspection location	Operation
5	Headlamp	LO for 10 seconds → HI ON ⇔ OFF 5 times
6	A/C compressor (magnet clutch)	ON ⇔ OFF 5 times

### 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

Symptom	Inspection contents	Possible cause
Rear window defogger does not operate	Perform auto active test. Does the rear window defogger operate?	YES BCM signal input circuit
		NO <ul style="list-style-type: none"> <li>• Rear window defogger</li> <li>• Rear window defogger ground circuit</li> <li>• Harness or connector between IPDM E/R and rear window defogger</li> <li>• IPDM E/R</li> </ul>
Any of the following components do not operate <ul style="list-style-type: none"> <li>• Parking lamp</li> <li>• License plate lamp</li> <li>• Tail lamp</li> <li>• Side marker lamp</li> <li>• Front fog lamp</li> <li>• Headlamp (HI, LO)</li> <li>• Front wiper (HI, LO)</li> </ul>	Perform auto active test. Does the applicable system operate?	YES BCM signal input circuit
		NO <ul style="list-style-type: none"> <li>• Lamp or motor</li> <li>• Lamp or motor ground circuit</li> <li>• Harness or connector between IPDM E/R and applicable system</li> <li>• IPDM E/R</li> </ul>
A/C compressor does not operate	Perform auto active test. Does the magnet clutch operate?	YES <ul style="list-style-type: none"> <li>• A/C auto amp. signal input circuit</li> <li>• CAN communication signal between A/C auto amp. and ECM</li> <li>• CAN communication signal between ECM and IPDM E/R</li> </ul>
		NO <ul style="list-style-type: none"> <li>• Magnet clutch</li> <li>• Harness or connector between IPDM E/R and magnet clutch</li> <li>• IPDM E/R</li> </ul>

# DIAGNOSIS SYSTEM (IPDM E/R)

## < SYSTEM DESCRIPTION >

Symptom	Inspection contents		Possible cause
Oil pressure warning lamp does not operate	Perform auto active test. Does the oil pressure warning lamp blink?	YES	<ul style="list-style-type: none"> <li>• Harness or connector between IPDM E/R and oil pressure switch</li> <li>• Oil pressure switch</li> <li>• IPDM E/R</li> </ul>
		NO	<ul style="list-style-type: none"> <li>• CAN communication signal between IPDM E/R and BCM</li> <li>• CAN communication signal between BCM and combination meter</li> <li>• Combination meter</li> </ul>

## CONSULT Function (IPDM E/R)

INFOID:000000009336403

### 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-22, "DTC Index"](#).

### DATA MONITOR

#### NOTE:

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

Monitor Item [Unit]	MAIN SIGNALS	Description
RAD 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.

## DIAGNOSIS SYSTEM (IPDM E/R)

### < SYSTEM DESCRIPTION >

Monitor Item [Unit]	MAIN SIG- NALS	Description
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.
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 A/T shift selector (detention switch) judged by IPDM E/R.
S/L RLY -REQ [Off/On]		<b>NOTE:</b> The item is indicated, but not monitored.
S/L STATE [LOCK/UNLK/UNKWN]		<b>NOTE:</b> 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]		Displays the status of the hood switch 1 judged by IPDM E/R.
HL WASHER REQ [Off/On]		Displays the status of the headlamp washer request signal received from BCM via CAN communication.
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.
HOOD SW 2 [Off/On]		Displays the status of the hood switch 2 judged by IPDM E/R.

### ACTIVE TEST

Test item	Operation	Description
CORNERING LAMP	LH	<b>NOTE:</b> This item is indicated, but cannot be tested.
	RH	
HORN	On	Operates horn relay for 20 ms.
REAR DEFOGGER	Off	OFF
	On	Operates the rear window defogger relay.
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	Transmits 50% pulse duty signal (PWM signal) to the cooling fan control module.
	3	Transmits 75% pulse duty signal (PWM signal) to the cooling fan control module.
	4	Transmits 100% pulse duty signal (PWM signal) to the cooling fan control module.
HEAD LAMP WASHER	On	Operates the headlamp washer relay for 1 second.

## 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.

\*: Operates while the engine is running.

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## BCM, IPDM E/R

< ECU DIAGNOSIS INFORMATION >

# ECU DIAGNOSIS INFORMATION

BCM, IPDM E/R

List of ECU Reference

INFOID:000000009008117

ECU	Reference
BCM	<a href="#">BCS-35, "Reference Value"</a>
	<a href="#">BCS-56, "Fail-safe"</a>
	<a href="#">BCS-57, "DTC Inspection Priority Chart"</a>
	<a href="#">BCS-57, "DTC Index"</a>
IPDM E/R	<a href="#">PCS-15, "Reference Value"</a>
	<a href="#">PCS-20, "Fail-safe"</a>
	<a href="#">PCS-22, "DTC Index"</a>

# WIPER AND WASHER SYSTEM


< WIRING DIAGRAM >

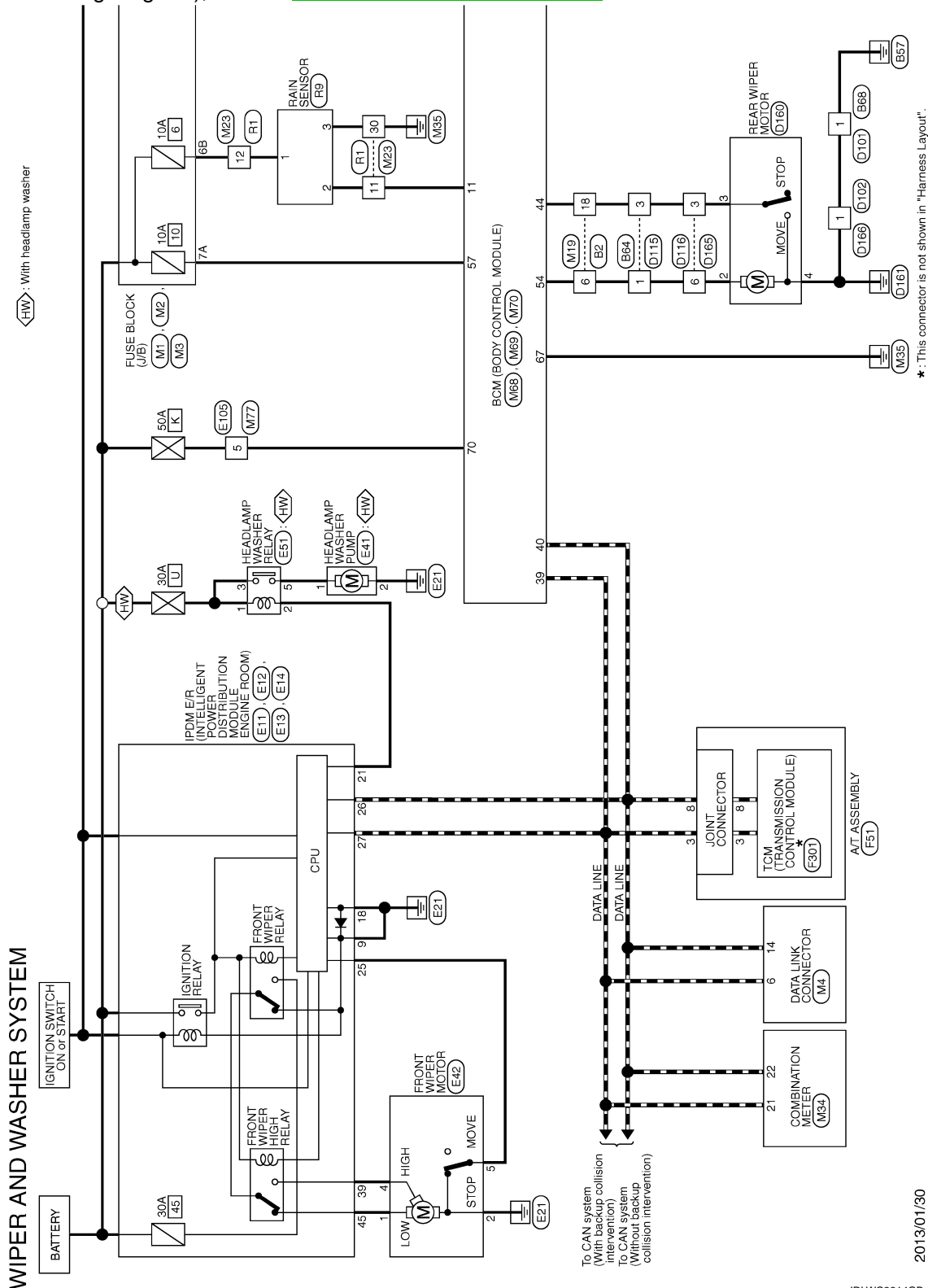
## WIRING DIAGRAM

### WIPER AND WASHER SYSTEM

#### Wiring Diagram

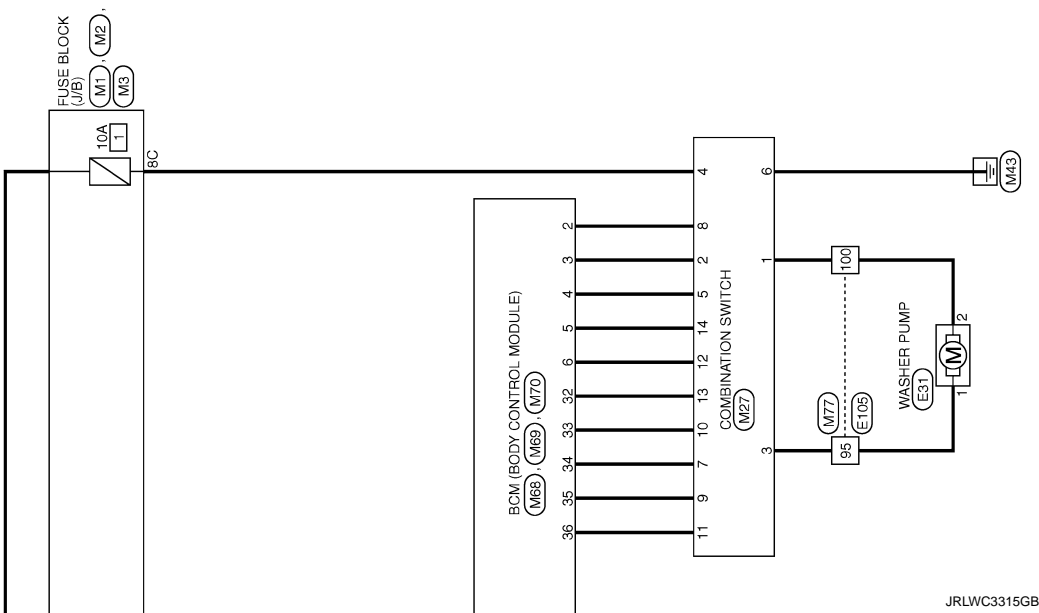
INFOID:000000009008118

For connector terminal arrangements, harness layouts, and alphabets in a  (option abbreviation; if not described in wiring diagram), refer to [GI-12. "Connector Information"](#).



WIPER AND WASHER SYSTEM

< WIRING DIAGRAM >





# DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

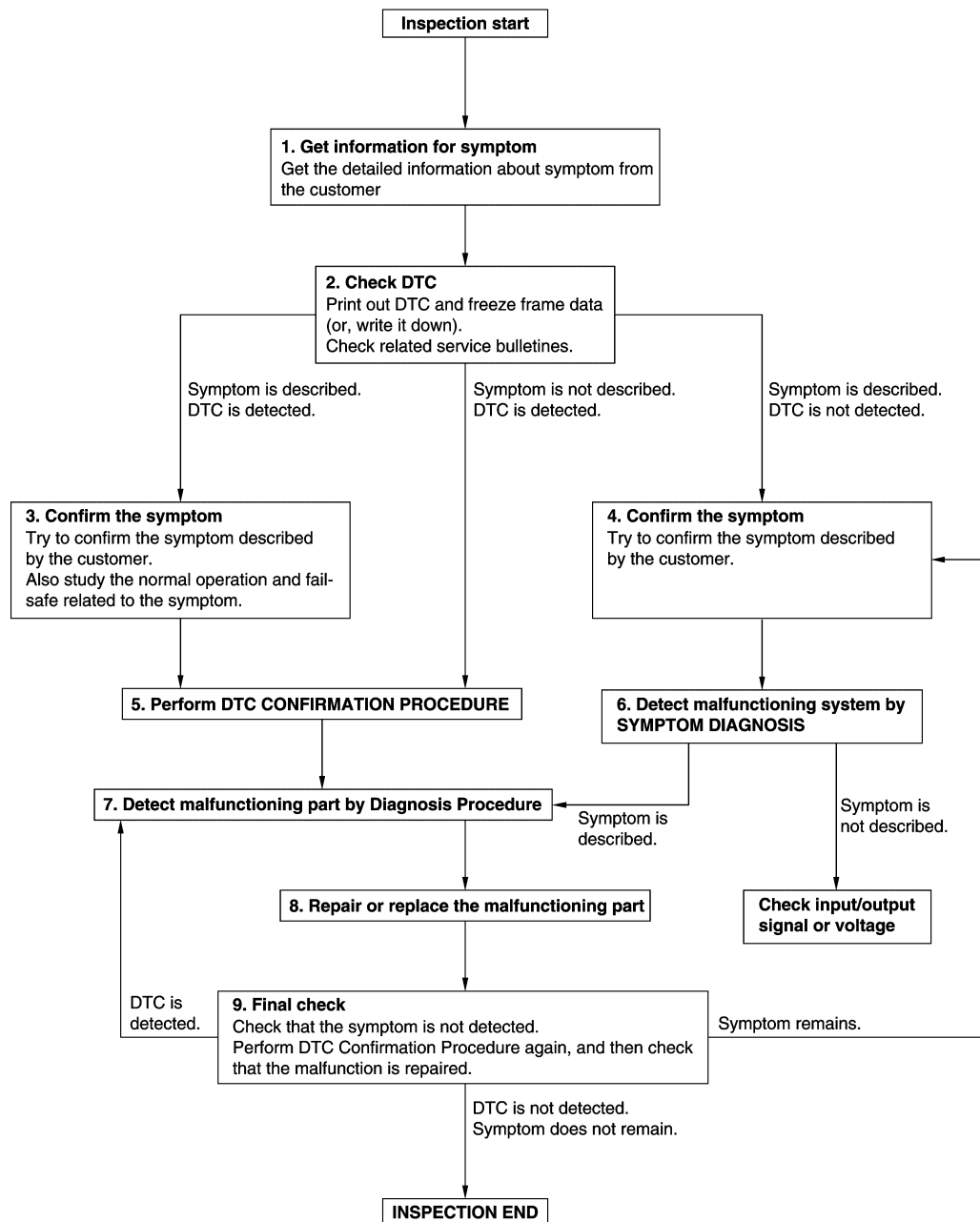
## BASIC INSPECTION

### DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:000000009008119

OVERALL SEQUENCE



DETAILED FLOW

JMKIA8652GB

# DIAGNOSIS AND REPAIR WORK FLOW

## < BASIC INSPECTION >

---

### 1.GET INFORMATION FOR SYMPTOM

---

1. Get detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurs).
2. Check operation condition of the function that is malfunctioning.

>> GO TO 2.

### 2.CHECK DTC

---

1. Check DTC.
2. Perform the following procedure if DTC is detected.
  - Record DTC and freeze frame data (Print them out using CONSULT.)
  - Erase DTC.
  - Study the relationship between the cause detected by DTC and the symptom described by the customer.
3. Check related service bulletins for information.

#### Are any symptoms described and any DTC detected?

Symptom is described, DTC is detected>>GO TO 3.

Symptom is described, DTC is not detected>>GO TO 4.

Symptom is not described, DTC is detected>>GO TO 5.

### 3.CONFIRM THE SYMPTOM

---

Try to confirm the symptom described by the customer.

Also study the normal operation and fail-safe related to the symptom.

Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 5.

### 4.CONFIRM THE SYMPTOM

---

Try to confirm the symptom described by the customer.

Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 6.

### 5.PERFORM DTC CONFIRMATION PROCEDURE

---

Perform DTC CONFIRMATION PROCEDURE for the detected DTC, and then check that DTC is detected again. At this time, always connect CONSULT to the vehicle, and check self diagnostic results in real time.

If two or more DTCs are detected, refer to [BCS-57. "DTC Inspection Priority Chart"](#) (BCM) or [PCS-22. "DTC Index"](#) (IPDM E/R), and determine trouble diagnosis order.

#### **NOTE:**

- Freeze frame data is useful if the DTC is not detected.
- Perform Component Function Check if DTC CONFIRMATION PROCEDURE is not included on Service Manual. This simplified check procedure is an effective alternative though DTC cannot be detected during this check.

If the result of Component Function Check is NG, it is the same as the detection of DTC by DTC CONFIRMATION PROCEDURE.

#### Is DTC detected?

YES >> GO TO 7.

NO >> Check according to [GI-43. "Intermittent Incident"](#).

### 6.DETECT MALFUNCTIONING SYSTEM BY SYMPTOM DIAGNOSIS

---

Detect malfunctioning system according to SYMPTOM DIAGNOSIS based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptom.

#### Is the symptom described?

YES >> GO TO 7.

NO >> Monitor input data from related sensors or check voltage of related module terminals using CONSULT.

### 7.DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

---

## DIAGNOSIS AND REPAIR WORK FLOW

### < BASIC INSPECTION >

---

Inspect according to Diagnosis Procedure of the system.

Is malfunctioning part detected?

YES >> GO TO 8.

NO >> Check according to [GI-43. "Intermittent Incident"](#).

### 8. REPAIR OR REPLACE THE MALFUNCTIONING PART

---

1. Repair or replace the malfunctioning part.
2. Reconnect parts or connectors disconnected during Diagnosis Procedure again after repair and replacement.
3. Check DTC. If DTC is detected, erase it.

>> GO TO 9.

### 9. FINAL CHECK

---

When DTC is detected in step 2, perform DTC CONFIRMATION PROCEDURE again, and then check that the malfunction is repaired securely.

When symptom is described by the customer, refer to confirmed symptom in step 3 or 4, and check that the symptom is not detected.

Is DTC detected and does symptom remain?

YES-1 >> DTC is detected: GO TO 7.

YES-2 >> Symptom remains: GO TO 4.

NO >> Before returning the vehicle to the customer, always erase DTC.

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# FRONT WIPER MOTOR LO CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

## DTC/CIRCUIT DIAGNOSIS

### FRONT WIPER MOTOR LO CIRCUIT

#### Component Function Check

INFOID:000000009008120

#### 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-28, "Diagnosis Procedure"](#).

#### Diagnosis Procedure

INFOID:000000009008121

#### 1.CHECK FRONT WIPER MOTOR (LO) OUTPUT VOLTAGE

1. Turn ignition switch OFF.
2. Disconnect front wiper motor connector.
3. Turn ignition switch ON, and wait for 10 seconds.
4. Check voltage between front wiper motor harness connector and ground.

(+)		(-)	Voltage (Approx.)
Front wiper motor			
Connector	Terminal		
E42	1	Ground	Battery voltage (10 seconds)*

\*: According to front wiper protection function, IPDM E/R supplies voltage for 10 seconds (battery voltage) and then stops for 20 seconds (0 V). This operations occurs repeatedly.

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	
E14	45	E42	1	Existed

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

IPDM E/R		Ground	Continuity
Connector	Terminal		
E14	45		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:000000009008122

#### 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-29, "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:000000009008123

#### 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				
E42	4	Ground	FRONT WIPER	Hi	Battery voltage (10 seconds)*

\*: According to front wiper protection function, IPDM E/R supplies voltage for 10 seconds (battery voltage) and then stops for 20 seconds (0 V). This operations occurs repeatedly.

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	
E14	39	E42	4	Existed

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

IPDM E/R		Ground	Continuity
Connector	Terminal		
E14	39		Not existed

Is the inspection result normal?

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

# FRONT WIPER STOP POSITION SIGNAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

## FRONT WIPER STOP POSITION SIGNAL CIRCUIT

### Component Function Check

INFOID:000000009008124

#### 1.CHECK FRONT WIPER STOP POSITION 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 >> Front wiper stop position signal circuit is normal.

NO >> Refer to [WW-30, "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:000000009008125

#### 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		
E42	5	Ground	12 V

Is the inspection result normal?

YES >> Replace front wiper motor.

NO >> GO TO 2.

#### 2.CHECK FRONT WIPER STOP POSITION SIGNAL 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	
E13	25	E42	5	Existed

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

IPDM E/R		Ground	Continuity
Connector	Terminal		
E13	25	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:0000000009008126

#### 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		
E42	2		Existed

Is the inspection result normal?

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

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# RAIN SENSOR

< DTC/CIRCUIT DIAGNOSIS >

## RAIN SENSOR

### Component Function Check

INFOID:000000009008127

#### 1.CHECK FRONT WIPER AUTO OPERATION

1. Clean rain sensor detection area of windshield fully.
2. When the front wiper switch is turned to AUTO position, front wiper operates once regardless of a rainy condition.

Is front wiper (AUTO) operation normally?

- YES >> Rain sensor circuit is normal.  
NO >> Refer to [WW-32. "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:000000009008128

#### 1.CHECK RAIN SENSOR FUSE

1. Turn ignition switch OFF.
2. Check that the following fuse is not fusing.

Unit	Location	No.	Capacity
Rain sensor	Fuse block (J/B)	6	10 A

Is the inspection result normal?

- YES >> GO TO 2.  
NO >> Replace the fuse after repairing the applicable circuit.

#### 2.CHECK RAIN SENSOR POWER SUPPLY

1. Disconnect rain sensor connector.
2. Check voltage between rain sensor harness connector and ground.

(+)		(-)	Voltage (Approx.)
Rain sensor			
Connector	Terminal		
R9	1	Ground	Battery voltage

Is the inspection result normal?

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

#### 3.CHECK RAIN SENSOR GROUND CIRCUIT

Check continuity between rain sensor harness connector and ground.

Rain sensor		Ground	Continuity
Connector	Terminal		
R9	3		Existed

Is the inspection result normal?

- YES >> GO TO 4.  
NO >> Repair or replace harness.

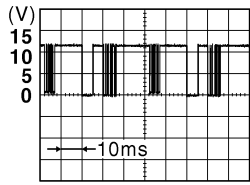
#### 4.CHECK RAIN SENSOR SIGNAL

1. Connect rain sensor connector.
2. Turn ignition switch ON.
3. Check signal between BCM harness connector and ground with oscilloscope.



# RAIN SENSOR

## < DTC/CIRCUIT DIAGNOSIS >

(+)		(-)	Condition	Signal (Reference value)
BCM				
Connector	Terminal			
M68	11	Ground	Ignition switch ON	<div><p>JPMIA0156GB Approx. 8.7V</p></div>

Is the inspection result normal?

YES >> Replace rain sensor.

NO >> GO TO 5.

### 5.CHECK RAIN SENSOR SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect BCM connector and rain sensor connector.
3. Check continuity between BCM harness connector and rain sensor harness connector.

BCM		Rain sensor		Continuity
Connector	Terminal	Connector	Terminal	
M68	11	R9	2	Existed

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace harness.

### 6.CHECK RAIN SENSOR SIGNAL CIRCUIT FOR SHORT

Check continuity between BCM harness connector and ground.

BCM		Ground	Continuity
Connector	Terminal		
M68	11		Not existed

Is the inspection result normal?

YES >> Replace BCM. Refer to [BCS-82. "Removal and Installation"](#).

NO >> Repair or replace harness.

# WASHER SWITCH

< DTC/CIRCUIT DIAGNOSIS >

## WASHER SWITCH

### Component Inspection

INFOID:000000009008129

#### 1.CHECK WASHER SWITCH

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

- A : Terminal 4  
B : Terminal 6  
C : Terminal 3  
D : Terminal 1

	OFF	FR	RR
A		○	○
B		○	○
C		○	○
D		○	○

JPLIA0164GB

Combination switch		Condition	Continuity
Terminal			
3	4	Front washer switch ON	Existed
1	6		
1	4	Rear washer switch ON	
6	3		

Is the inspection result normal?

- YES >> INSPECTION END  
NO >> Replace combination switch.

# REAR WIPER MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

## REAR WIPER MOTOR CIRCUIT

### Component Function Check

INFOID:000000009008130

#### 1.CHECK REAR WIPER ON OPERATION

##### CONSULT ACTIVE TEST

1. Select "RR WIPER" of BCM active test item.
2. With operating the test item, check rear wiper operation.

**On** : Rear wiper ON operation

**Off** : Stop the rear wiper.

Is rear wiper operation normally?

- YES >> Rear wiper motor circuit is normal.  
NO >> Refer to [WW-35, "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:000000009008131

#### 1.CHECK REAR WIPER MOTOR OUTPUT VOLTAGE

##### CONSULT ACTIVE TEST

1. Turn rear wiper switch OFF, and wait for 1 minute or more.
2. Turn ignition switch OFF.
3. Disconnect rear wiper motor connector.
4. Turn ignition switch ON.
5. Select "RR WIPER" of BCM active test item.
6. With operating the test item, check voltage between rear wiper motor harness connector and ground.

(+)		(-)	Condition		Voltage (Approx.)
Rear wiper motor					
Connector	Terminal				
D160	2	Ground	REAR WIPER	On	12 V (5 seconds*)

\*: When "REAR WIPER" is "On" for 5 seconds or more during active test of CONSULT, BCM stops the power supply according to rear wiper motor protection function. To perform the check again, turn "REAR WIPER" to "Off", wait for 1 minute or more, and then perform the check.

Is the inspection result normal?

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

#### 2.CHECK REAR WIPER MOTOR CIRCUIT

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

BCM		Rear wiper motor		Continuity
Connector	Terminal	Connector	Terminal	
M69	54	D160	2	Existed

4. Check continuity between BCM harness connector and ground.

BCM		Ground	Continuity
Connector	Terminal		
M69	54		Not existed

Is the inspection result normal?

- YES >> Replace BCM. Refer to [BCS-82, "Removal and Installation"](#).  
NO >> Repair or replace harness.

## REAR WIPER MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

### 3.CHECK REAR WIPER MOTOR GROUND OPEN CIRCUIT

Check continuity between rear wiper motor harness connector and ground.

Rear wiper motor		Ground	Continuity
Connector	Terminal		
D160	4		Existed

Is the inspection result normal?

YES >> Replace rear wiper motor.  
NO >> Repair or replace harness.

# REAR WIPER STOP POSITION SIGNAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

## REAR WIPER STOP POSITION SIGNAL CIRCUIT

### Component Function Check

INFOID:0000000009008132

#### 1.CHECK REAR WIPER STOP POSITION SIGNAL

##### CONSULT DATA MONITOR

1. Select "WIPER" of BCM data monitor item.
2. Operate the rear wiper.
3. Check that "RR WIPER STOP" changes to "On" and "Off" linked with the wiper operation.

Monitor item	Condition		Monitor status
RR WIPER STOP	Rear wiper motor	Stop position	On
		Except stop position	Off

Is the status of item normal?

YES >> Rear wiper stop position signal circuit is normal.

NO >> Refer to [WW-37. "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:0000000009008133

#### 1.CHECK BCM OUTPUT VOLTAGE

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

(+)		(-)	Voltage (Approx.)
Rear wiper motor			
Connector	Terminal		
D160	3	Ground	12 V

Is the inspection result normal?

YES >> Replace rear wiper motor.

NO >> GO TO 2.

#### 2.CHECK REAR WIPER STOP POSITION SIGNAL CIRCUIT

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

BCM		Rear wiper motor		Continuity
Connector	Terminal	Connector	Terminal	
M69	44	D160	3	Existed

4. Check continuity between BCM harness connector and ground.

BCM		Ground	Continuity
Connector	Terminal		
M69	44		Not existed

Is the inspection result normal?

YES >> Replace BCM. Refer to [BCS-82. "Removal and Installation"](#).

NO >> Repair or replace harness.

# HEADLAMP WASHER CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

## HEADLAMP WASHER CIRCUIT

### Component Function Check

INFOID:000000009008134

#### 1.CHECK HEADLAMP WASHER OPERATION

##### CONSULT ACTIVE TEST

1. Select "HEAD LAMP WASHER" of IPDM E/R active test item.
2. With operating the test item, check headlamp operation.

**On** :Headlamp washer ON operation

**Off** :Stop the headlamp washer.

Is headlamp washer operation normal?

- YES >> Headlamp washer circuit is normal.  
NO >> Refer to [WW-38, "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:000000009008135

#### 1.CHECK HEADLAMP WASHER FUSIBLE LINK

1. Turn ignition switch OFF.
2. Check that the following fusible link is not fusing.

Unit	Fusible link No.	Capacity
Headlamp washer	U	30 A

Is the inspection result normal?

- YES >> GO TO 2.  
NO >> Replace the fusible link after repairing the applicable circuit.

#### 2.CHECK HEADLAMP WASHER RELAY POWER SUPPLY

1. Remove headlamp washer relay.
2. Check voltage between headlamp washer relay harness connector and ground.

(+)		(-)	Voltage (Approx.)
Headlamp washer relay			
Connector	Terminal		
E51	1	Ground	Battery voltage
	3		

Is the inspection result normal?

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

#### 3.CHECK HEADLAMP WASHER RELAY

Check headlamp washer relay. Refer to [WW-40, "Component Inspection"](#).

Is the headlamp washer relay normal?

- YES >> GO TO 4.  
NO >> Replace headlamp washer relay.

#### 4.CHECK HEADLAMP WASHER RELAY CONTROL SIGNAL

##### CONSULT ACTIVE TEST

1. Turn ignition switch OFF.
2. Install headlamp washer relay.
3. Turn ignition switch ON.
4. Select "HEAD LAMP WASHER" of IPDM E/R active test item.
5. With operating the test item, check voltage between IPDM E/R harness connector and ground.

# HEADLAMP WASHER CIRCUIT

## < DTC/CIRCUIT DIAGNOSIS >

(+) IPDM E/R		(-)	Condition	Voltage (Approx.)
Connector	Terminal			
E12	21	Ground	HEAD LAMP WASHER On	0 V
			Off	12 V

Is the inspection result normal?

YES >> GO TO 7.

Fixed at 0 V >> GO TO 5.

Fixed at 12 V >> Replace IPDM E/R.

### 5. CHECK HEADLAMP WASHER RELAY CONTROL SIGNAL OPEN CIRCUIT

1. Turn ignition switch OFF.
2. Remove headlamp washer relay.
3. Disconnect IPDM E/R harness connector.
4. Check continuity between IPDM E/R harness connector and headlamp washer relay harness connector.

IPDM E/R		Headlamp washer relay		Continuity
Connector	Terminal	Connector	Terminal	
E12	21	E51	2	Existed

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace harness.

### 6. CHECK HEADLAMP WASHER RELAY CONTROL SIGNAL SHORT CIRCUIT

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

IPDM E/R		Ground	Continuity
Connector	Terminal		
E12	21		Not existed

Is the inspection result normal?

YES >> Replace IPDM E/R.

NO >> Repair or replace harness.

### 7. CHECK HEADLAMP WASHER PUMP OPEN CIRCUIT

1. Turn ignition switch OFF.
2. Remove headlamp washer relay.
3. Disconnect headlamp washer pump connector.
4. Check continuity between headlamp washer relay harness connector and headlamp washer pump harness connector.

Headlamp washer relay		Headlamp washer pump		Continuity
Connector	Terminal	Connector	Terminal	
E51	5	E41	1	Existed

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace harness.

### 8. CHECK HEADLAMP WASHER PUMP (GND) OPEN CIRCUIT

Check continuity headlamp washer pump harness connector and ground.

Headlamp washer pump		Ground	Continuity
Connector	Terminal		
E41	2		Existed

# HEADLAMP WASHER CIRCUIT

## < DTC/CIRCUIT DIAGNOSIS >

### Is the inspection result normal?

- YES >> Replace headlamp washer pump.  
NO >> Repair or replace harness.

## Component Inspection

INFOID:0000000009008136

### 1. CHECK HEADLAMP WASHER RELAY

1. Turn ignition switch OFF.
2. Remove headlamp washer relay.
3. Apply battery voltage to headlamp washer relay between terminals 1 and 2.
4. Check continuity of headlamp washer relay.

Headlamp washer relay		Condition		Continuity
Terminal				
3	5	Voltage	Apply	Existed
			Not Apply	Not existed

### Is the inspection result normal?

- YES >> Headlamp washer relay is normal.  
NO >> Replace headlamp washer relay.



# WIPER AND WASHER SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

## SYMPTOM DIAGNOSIS

### WIPER AND WASHER SYSTEM SYMPTOMS

#### Symptom Table

INFOID:000000009008137

Symptom	Probable malfunction location	Inspection item
Front wiper does not operate	HI only	<ul style="list-style-type: none"> <li>Combination switch</li> <li>Harness between combination switch and BCM</li> <li>BCM</li> </ul> Refer to <a href="#">BCS-80, "Symptom Table"</a>
		<ul style="list-style-type: none"> <li>IPDM E/R</li> <li>Harness between IPDM E/R and front wiper motor</li> <li>Front wiper motor</li> </ul> Front wiper motor (HI) circuit Refer to <a href="#">WW-29, "Component Function Check"</a>
		Front wiper request signal <ul style="list-style-type: none"> <li>BCM</li> <li>IPDM E/R</li> </ul> IPDM E/R DATA MONITOR "FR WIP REQ"
	LO only	<ul style="list-style-type: none"> <li>Combination switch</li> <li>Harness between combination switch and BCM</li> <li>BCM</li> </ul> Refer to <a href="#">BCS-80, "Symptom Table"</a>
		<ul style="list-style-type: none"> <li>IPDM E/R</li> <li>Harness between IPDM E/R and front wiper motor</li> <li>Front wiper motor</li> </ul> Front wiper motor (LO) circuit Refer to <a href="#">WW-28, "Component Function Check"</a>
		Front wiper request signal <ul style="list-style-type: none"> <li>BCM</li> <li>IPDM E/R</li> </ul> IPDM E/R DATA MONITOR "FR WIP REQ"
	AUTO only	<ul style="list-style-type: none"> <li>Combination switch</li> <li>Harness between combination switch and BCM</li> <li>BCM</li> </ul> Refer to <a href="#">BCS-80, "Symptom Table"</a>
		<ul style="list-style-type: none"> <li>Rain sensor</li> <li>Harness between rain sensor and BCM</li> <li>BCM</li> </ul> Rain sensor Refer to <a href="#">WW-32, "Component Function Check"</a>
	HI, LO and AUTO	SYMPTOM DIAGNOSIS "FRONT WIPER DOES NOT OPERATE" Refer to <a href="#">WW-45, "Diagnosis Procedure"</a>
Front wiper does not stop	HI only	<ul style="list-style-type: none"> <li>Combination switch</li> <li>BCM</li> </ul> Refer to <a href="#">BCS-80, "Symptom Table"</a>
		Front wiper request signal <ul style="list-style-type: none"> <li>BCM</li> <li>IPDM E/R</li> </ul> IPDM E/R DATA MONITOR "FR WIP REQ"
		IPDM E/R —
	LO only	<ul style="list-style-type: none"> <li>Combination switch</li> <li>BCM</li> </ul> Refer to <a href="#">BCS-80, "Symptom Table"</a>
		Front wiper request signal <ul style="list-style-type: none"> <li>BCM</li> <li>IPDM E/R</li> </ul> IPDM E/R DATA MONITOR "FR WIP REQ"
		IPDM E/R —
	AUTO only	<ul style="list-style-type: none"> <li>Combination switch</li> <li>BCM</li> </ul> Refer to <a href="#">BCS-80, "Symptom Table"</a>
		<ul style="list-style-type: none"> <li>Rain sensor</li> <li>Harness between rain sensor and BCM</li> <li>BCM</li> </ul> Rain sensor Refer to <a href="#">WW-32, "Component Function Check"</a>

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# WIPER AND WASHER SYSTEM SYMPTOMS

## < SYMPTOM DIAGNOSIS >

Symptom		Probable malfunction location	Inspection item
Front wiper does not operate normally	Sensitivity adjustment cannot be performed.	<ul style="list-style-type: none"> <li>Combination switch</li> <li>Harness between combination switch and BCM</li> <li>BCM</li> </ul>	Combination switch Refer to <a href="#">BCS-80, "Symptom Table"</a>
		BCM	—
	Auto wiping operation does not operate	Check that the wiper setting is auto wiping operation Refer to <a href="#">WW-14, "WIPER : CONSULT Function (BCM - WIPER)"</a>	
	Wiper is not linked to the washer operation.	<ul style="list-style-type: none"> <li>Combination switch</li> <li>Harness between combination switch and BCM</li> <li>BCM</li> </ul>	Combination switch Refer to <a href="#">BCS-80, "Symptom Table"</a>
		BCM	—
	Does not return to stop position. [Repeatedly operates for 10 seconds and then stops for 20 seconds. (Fail-safe)]	<ul style="list-style-type: none"> <li>IPDM E/R</li> <li>Harness between IPDM E/R and front wiper motor</li> <li>Front wiper motor</li> </ul>	Front wiper stop position signal circuit Refer to <a href="#">WW-30, "Component Function Check"</a>
Rear wiper does not operate	ON only	<ul style="list-style-type: none"> <li>Combination switch</li> <li>Harness between combination switch and BCM</li> <li>BCM</li> </ul>	Combination switch Refer to <a href="#">BCS-80, "Symptom Table"</a>
	INT only	<ul style="list-style-type: none"> <li>Combination switch</li> <li>Harness between combination switch and BCM</li> <li>BCM</li> </ul>	Combination switch Refer to <a href="#">BCS-80, "Symptom Table"</a>
	ON and INT	<ul style="list-style-type: none"> <li>Combination switch</li> <li>Harness between combination switch and BCM</li> <li>BCM</li> </ul>	Combination switch Refer to <a href="#">BCS-80, "Symptom Table"</a>
		<ul style="list-style-type: none"> <li>BCM</li> <li>Harness between rear wiper motor and BCM</li> <li>Harness between rear wiper motor and ground</li> <li>Rear wiper motor</li> </ul>	Rear wiper motor circuit Refer to <a href="#">WW-35, "Component Function Check"</a>
Rear wiper does not stop	ON only	<ul style="list-style-type: none"> <li>Combination switch</li> <li>BCM</li> </ul>	Combination switch Refer to <a href="#">BCS-80, "Symptom Table"</a>
	INT only	<ul style="list-style-type: none"> <li>Combination switch</li> <li>BCM</li> </ul>	Combination switch Refer to <a href="#">BCS-80, "Symptom Table"</a>
Rear wiper does not operate normally	Wiper is not linked to the washer operation.	<ul style="list-style-type: none"> <li>Combination switch</li> <li>Harness between rear wiper motor and BCM</li> <li>BCM</li> </ul>	Combination switch Refer to <a href="#">BCS-80, "Symptom Table"</a>
		BCM	—
	Rear wiper does not return to the stop position. [Stops after a five-second operation. (Fail-safe)]	<ul style="list-style-type: none"> <li>BCM</li> <li>Harness between rear wiper motor and BCM</li> <li>Rear wiper motor</li> </ul>	Rear wiper stop position signal circuit Refer to <a href="#">WW-37, "Component Function Check"</a>

# WIPER AND WASHER SYSTEM SYMPTOMS

## < SYMPTOM DIAGNOSIS >

Symptom		Probable malfunction location	Inspection item
Headlamp washer does not operate.	Headlamp washer does not operate with the front washer when headlamps are turned ON.	<ul style="list-style-type: none"> <li>Combination switch</li> <li>Harness between combination switch and BCM</li> <li>BCM</li> </ul>	Combination switch Refer to <a href="#">BCS-80, "Symptom Table"</a>
		<ul style="list-style-type: none"> <li>Fusible link</li> <li>Harness between fusible link and headlamp washer relay</li> <li>Headlamp washer relay</li> <li>Harness between headlamp washer relay and IPDM E/R</li> <li>IPDM E/R</li> <li>Harness between headlamp washer relay and headlamp washer pump</li> <li>headlamp washer pump</li> <li>Harness between headlamp washer pump and ground</li> </ul>	Headlamp washer circuit Refer to <a href="#">WW-38, "Component Function Check"</a>
		BCM	—

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## NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

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### NORMAL OPERATING CONDITION

#### Description

INFOID:000000009008138

#### 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.

#### REAR WIPER MOTOR PROTECTION FUNCTION

- BCM may stop rear wiper to protect the rear wiper motor when the rear wiper is stopped for 5 seconds or more due to a snowfall.
- Rear wiper operates normally one minute after the obstacles are removed with rear wiper OFF.

# FRONT WIPER DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

## FRONT WIPER DOES NOT OPERATE

### Description

INFOID:000000009008139

The front wiper does not operate under any operation conditions.

### Diagnosis Procedure

INFOID:000000009008140

#### 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 4.

NO >> GO TO 2.

#### 2.CHECK FRONT WIPER MOTOR FUSE

1. Turn ignition switch OFF.
2. Check that the following fuse is not fusing.

Unit	Location	No.	Capacity
Front wiper motor	IPDM E/R	45	30 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-31, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace harness.

#### 4.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 5.

#### 5.CHECK COMBINATION SWITCH

Perform the inspection of the combination switch. Refer to [BCS-80, "Symptom Table"](#).

Is combination switch normal?

## FRONT WIPER DOES NOT OPERATE

### < SYMPTOM DIAGNOSIS >

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- YES >> Replace BCM. Refer to [BCS-82. "Removal and Installation"](#).
- NO >> Repair or replace the applicable parts.

# HEADLAMP WASHER NOZZLE AND TUBE

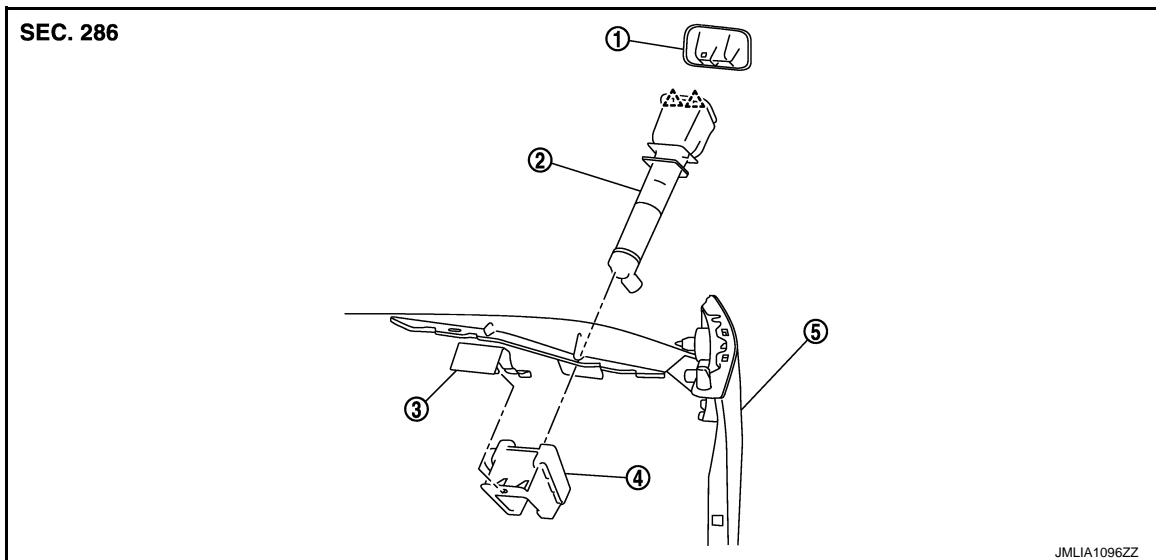
< REMOVAL AND INSTALLATION >

## REMOVAL AND INSTALLATION

### HEADLAMP WASHER NOZZLE AND TUBE

Exploded View

INFOID:000000009008141

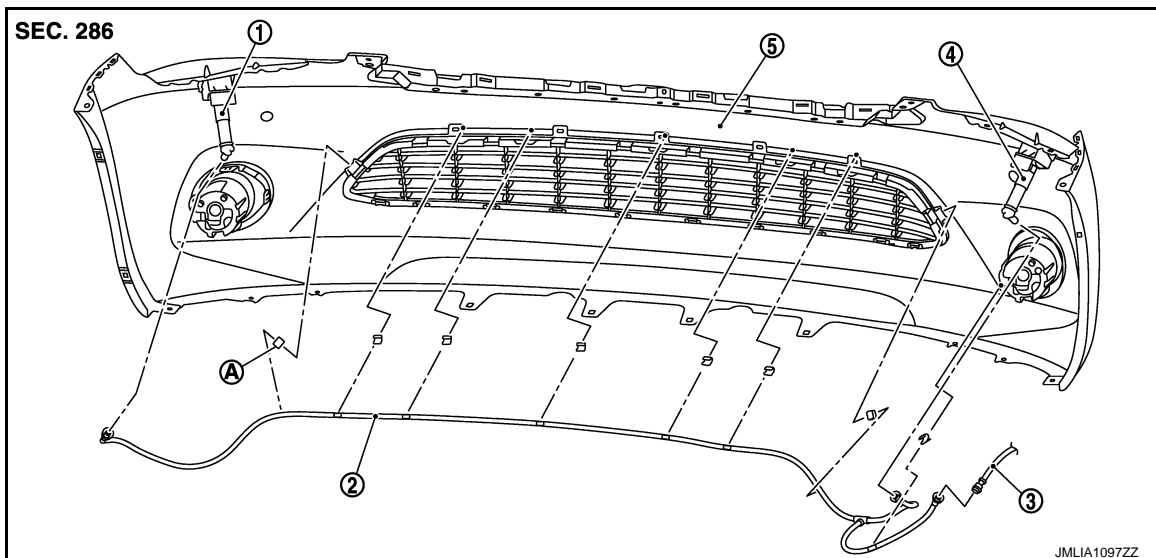


- 1. Headlamp washer nozzle cover
- 2. Headlamp washer nozzle assembly
- 3. Headlamp washer nozzle retainer
- 4. Headlamp washer nozzle bracket
- 5. Front bumper fascia

△ : Pawl

Hydraulic Layout

INFOID:000000009008142



- 1. Headlamp washer nozzle assembly LH
- 2. Headlamp washer tube
- 3. Headlamp washer tube (tank side)
- 4. Headlamp washer nozzle assembly RH
- 5. Front bumper fascia
- A. Metal clip

# HEADLAMP WASHER NOZZLE AND TUBE

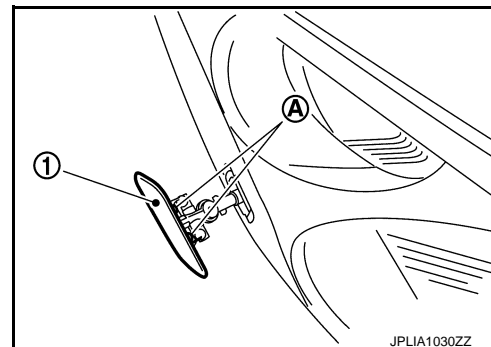
## < REMOVAL AND INSTALLATION >

### Removal and Installation

INFOID:000000009008143

#### REMOVAL

1. Pull out headlamp washer nozzle from bumper fascia, disengage pawl (A), and then remove headlamp washer nozzle cover (1).



2. Remove front bumper fascia. Refer to [EXT-12, "Removal and Installation"](#).
3. Disconnect headlamp washer tube joint.
4. Remove headlamp washer nozzle retainer.
5. Remove headlamp washer nozzle bracket.
6. Remove headlamp washer nozzle from the front bumper fascia.

#### INSTALLATION

Install in the reverse order of removal.

#### Inspection

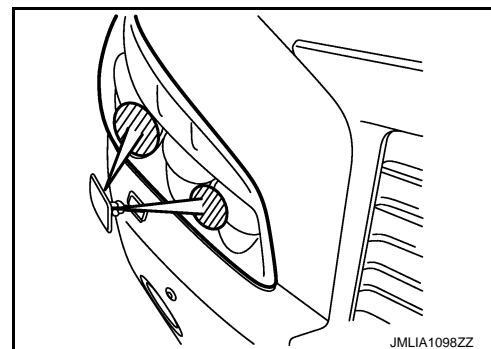
INFOID:000000009008144

#### HEADLAMP WASHER NOZZLE SPRAY POSITION INSPECTION

##### CAUTION:

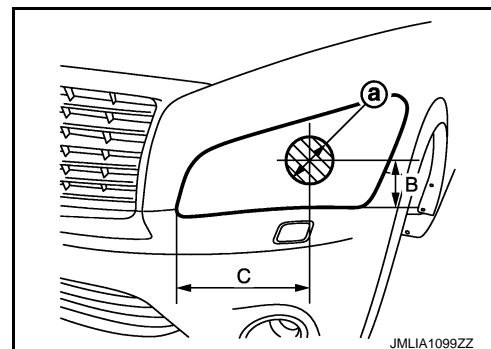
Replace headlamp washer nozzle assembly with a new part if headlamp washer jet position is outside the headlamp illumination area shown in the figure.

- Check that headlamp washer injection is certainly on headlamp illumination area.



- Check the headlamp washer injection range as shown in the figure.

- a : 67.8 mm (2.31 in)
- B : 83.2 mm (3.04 in)
- C : 316.2 mm (12.13 in)

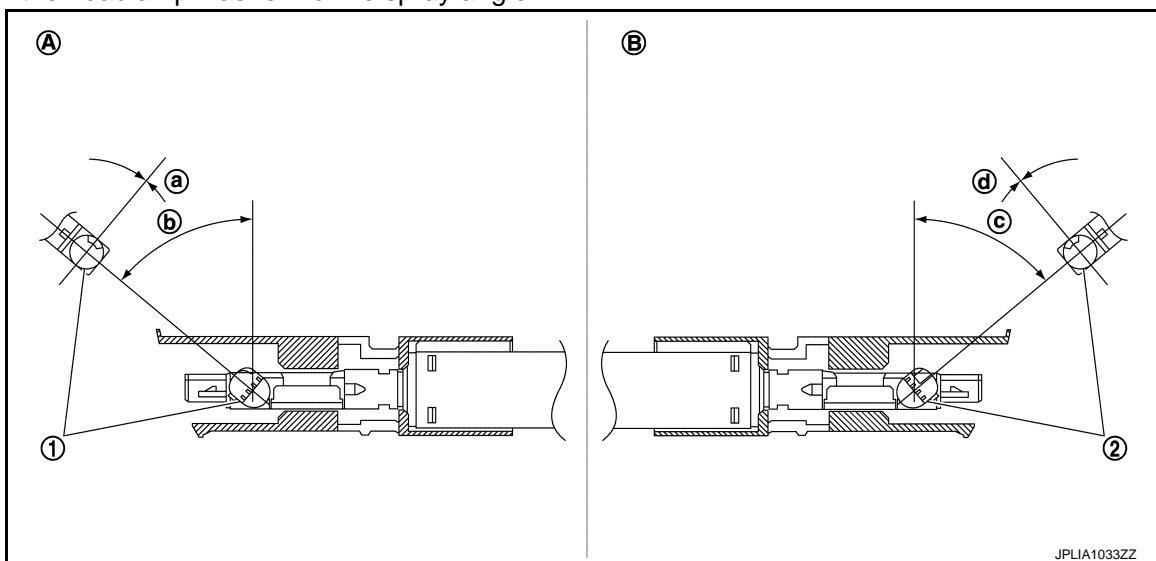




# HEADLAMP WASHER NOZZLE AND TUBE

## < REMOVAL AND INSTALLATION >

- Check the headlamp washer nozzle spray angle.



1. Headlamp washer nozzle (outside) 2. Headlamp washer nozzle (inside)

### Outside (A)

a :  $30^{\circ} \pm 3^{\circ}$

b :  $70^{\circ} \pm 3^{\circ}$

### Inside (B)

c :  $55^{\circ} \pm 3^{\circ}$

d :  $45^{\circ} \pm 3^{\circ}$

### NOTE:

This drawing shows the parts of the headlamp washer nozzle (LH). The headlamp washer nozzle (RH) is symmetrical of this drawing.

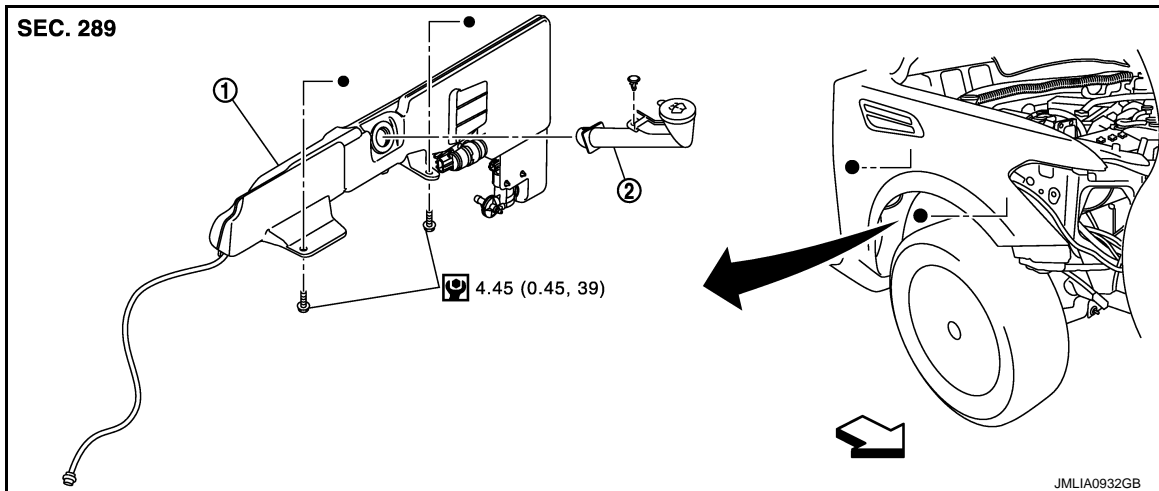
# WASHER TANK

< REMOVAL AND INSTALLATION >

## WASHER TANK

### Exploded View

INFOID:000000009008145



1. Washer tank

2. Washer tank inlet

⇐ : Vehicle front

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

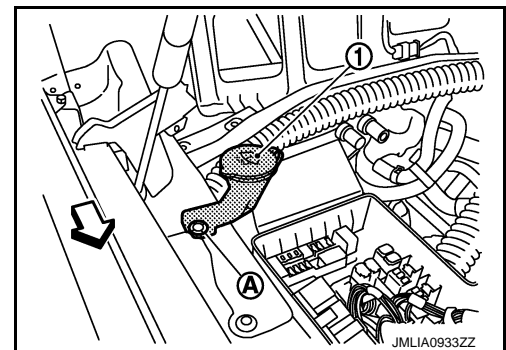
## Removal and Installation

INFOID:000000009008146

### REMOVAL

1. Fully open hood.
2. Remove washer tank inlet fixing clip (A).
3. Pull out washer tank inlet (1) from washer tank.

⇐ : Vehicle front

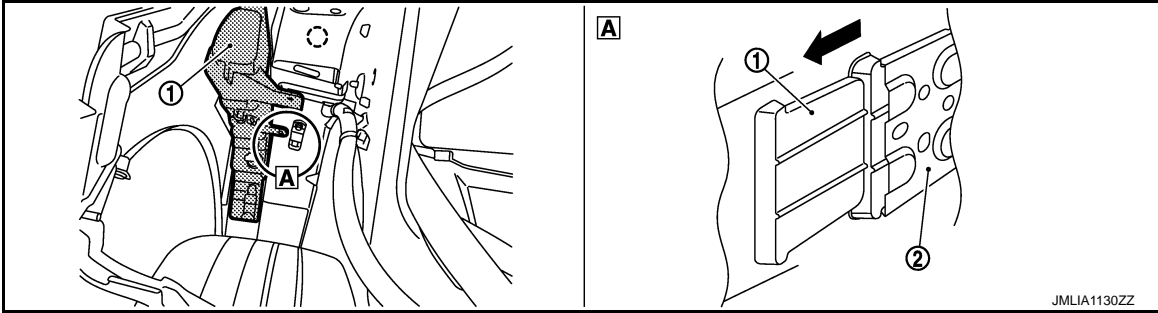


4. Remove fender protector RH (front). Refer to [EXT-23, "FENDER PROTECTOR : Removal and Installation"](#).
5. Disconnect washer pump connector.
6. Disconnect headlamp washer pump connector.
7. Disconnect washer level switch connector.
8. Disconnect front washer tube and rear washer tube.
9. Disconnect headlamp washer tube joint.
10. Remove washer tank mounting bolts.

## WASHER TANK

### < REMOVAL AND INSTALLATION >

11. Pull washer tank (1) out of body panel bracket (2) to remove from the vehicle.



### INSTALLATION

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

#### **CAUTION:**

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

A  
B  
C  
D  
E  
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G  
H  
I  
J  
K  
WW  
M  
N  
O  
P

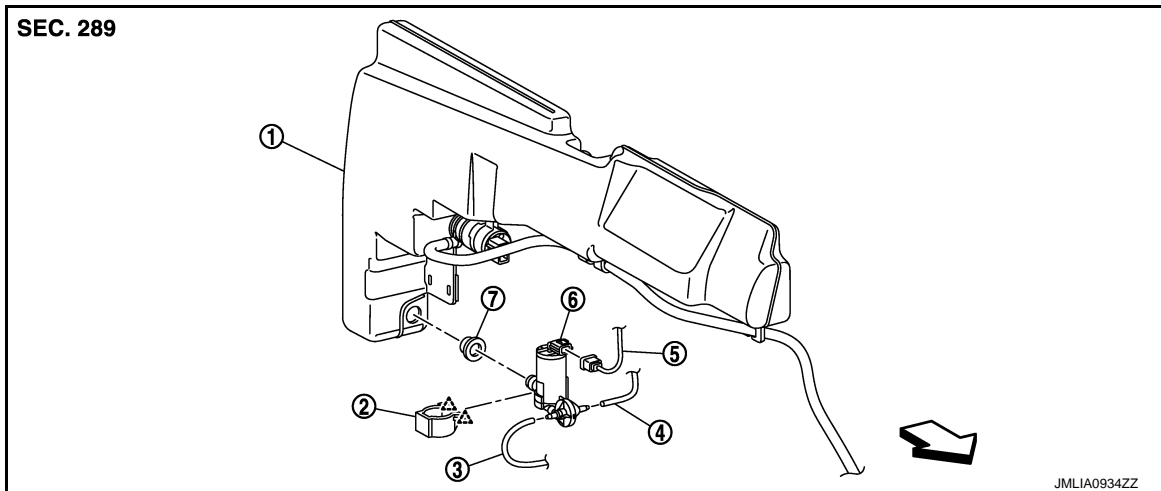
# WASHER PUMP

< REMOVAL AND INSTALLATION >

## WASHER PUMP

Exploded View

INFOID:000000009008147



- |                      |                                  |                     |
|----------------------|----------------------------------|---------------------|
| 1. Washer tank       | 2. Bracket                       | 3. Rear washer tube |
| 4. Front washer tube | 5. Washer pump harness connector | 6. Washer pump      |
| 7. Packing           |                                  |                     |

△ : Pawl

⇐ : Vehicle front

## Removal and Installation

INFOID:000000009008148

### REMOVAL

1. Remove washer tank. Refer to [WW-50. "Removal and Installation"](#).
2. Remove washer pump from washer tank.
3. Remove packing from washer tank.

### INSTALLATION

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

#### CAUTION:

- Check that there is no leakage after installation or replace packing with new part if it has been damaged.
- Never twist the packing when installing the washer pump.

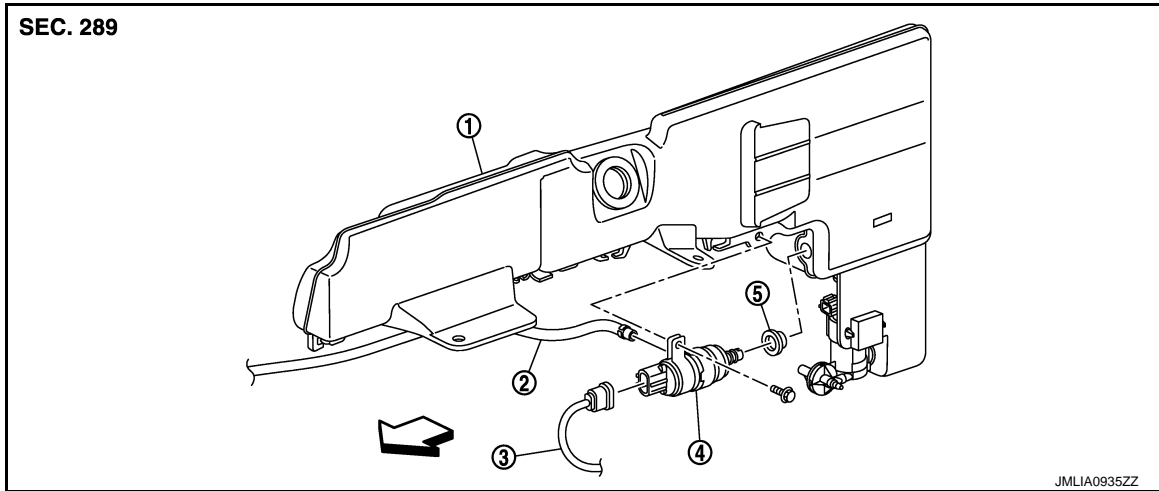
# HEADLAMP WASHER PUMP

< REMOVAL AND INSTALLATION >

## HEADLAMP WASHER PUMP

Exploded View

INFOID:000000009008149



- |                         |                         |   |
|-------------------------|-------------------------|---|
| 1. Washer tank          | 2. Headlamp washer tube | 3. Headlamp washer pump harness connector |
| 4. Headlamp washer pump | 5. Packing              |   |
- ⇐ : Vehicle front

## Removal and Installation

INFOID:000000009008150

### REMOVAL

1. Remove washer tank. Refer to [WW-50, "Removal and Installation"](#).
2. Remove the mounting bolt, and then remove headlamp washer pump from the washer tank.
3. Remove the packing from the washer tank.

### INSTALLATION

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

#### CAUTION:

- Check that there is no leakage after installation or replace packing with new part if it has been damaged.
- Never twist the packing when installing the headlamp washer pump.

A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
WW  
M  
N  
O  
P

## WASHER LEVEL SWITCH

< REMOVAL AND INSTALLATION >

---

### WASHER LEVEL SWITCH

#### Removal and Installation

INFOID:000000009008151

The washer level switch must be replaced together with the washer tank as an assembly. Refer to [WW-50](#), "[Removal and Installation](#)".

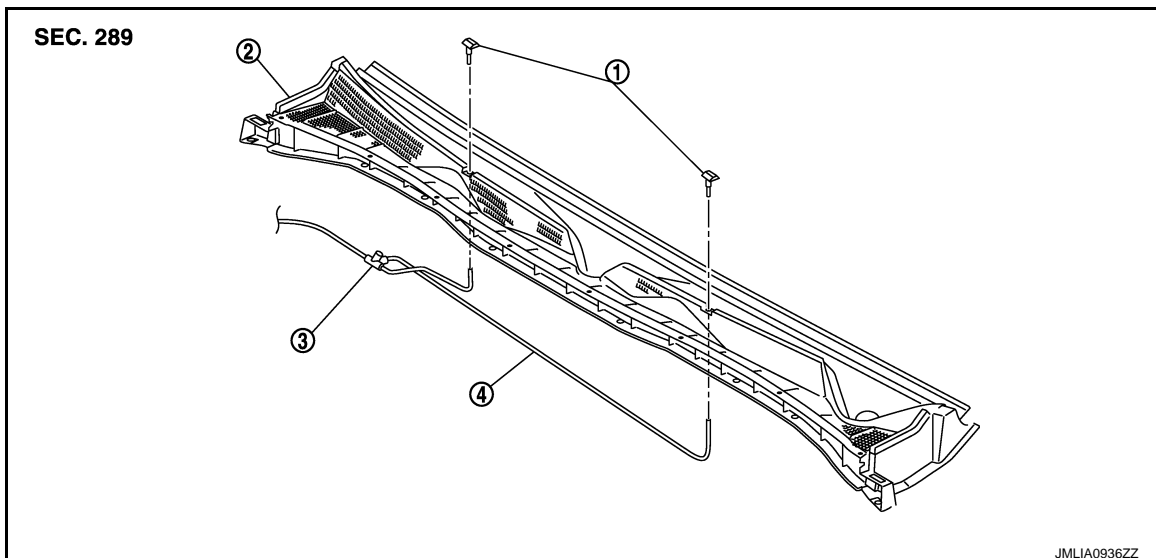
# FRONT WASHER NOZZLE AND TUBE

< REMOVAL AND INSTALLATION >

## FRONT WASHER NOZZLE AND TUBE

Exploded View

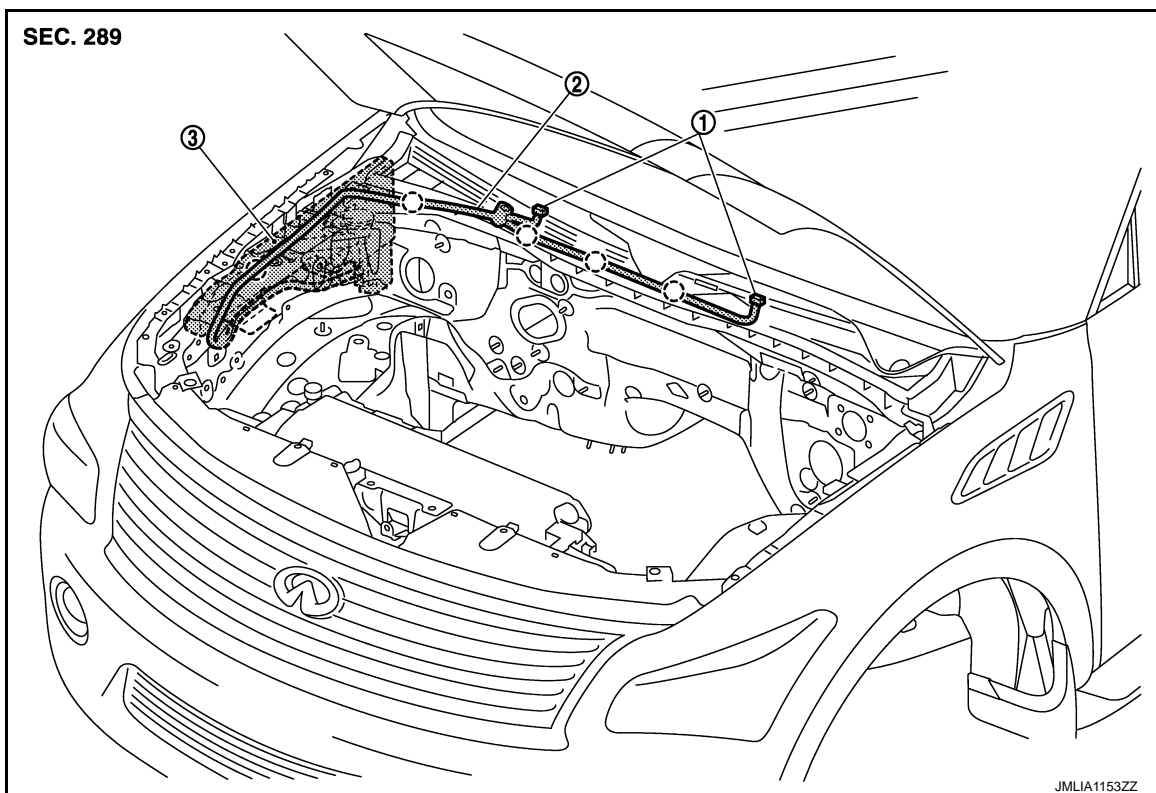
INFOID:000000009008152



- |                        |                   |                |
|------------------------|-------------------|----------------|
| 1. Front washer nozzle | 2. Cowl top cover | 3. Check valve |
| 4. Front washer tube   |                   |                |

Hydraulic Layout

INFOID:000000009008153



- |                        |                      |                |
|------------------------|----------------------|----------------|
| 1. Front washer nozzle | 2. Front washer tube | 3. Washer tank |
|------------------------|----------------------|----------------|

○ : Clip

# FRONT WASHER NOZZLE AND TUBE

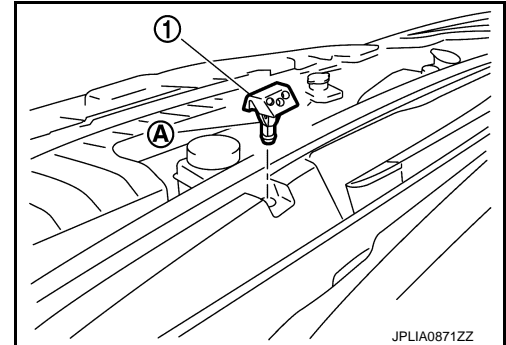
## < REMOVAL AND INSTALLATION >

### Removal and Installation

INFOID:000000009008154

#### REMOVAL

1. Remove cowl top cover. Refer to [EXT-21, "Removal and Installation"](#).
2. Disconnect front washer tube from front washer nozzle.
3. 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 item, and then install in the reverse order of removal.

#### **CAUTION:**

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

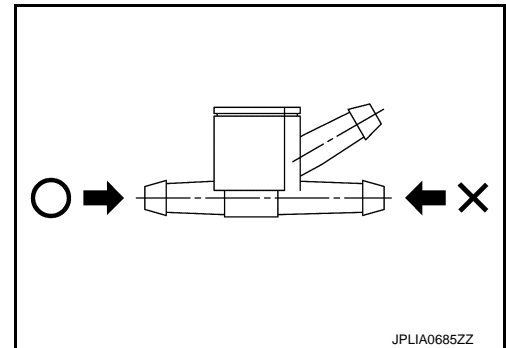
#### Inspection and Adjustment

INFOID:000000009008155

#### 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

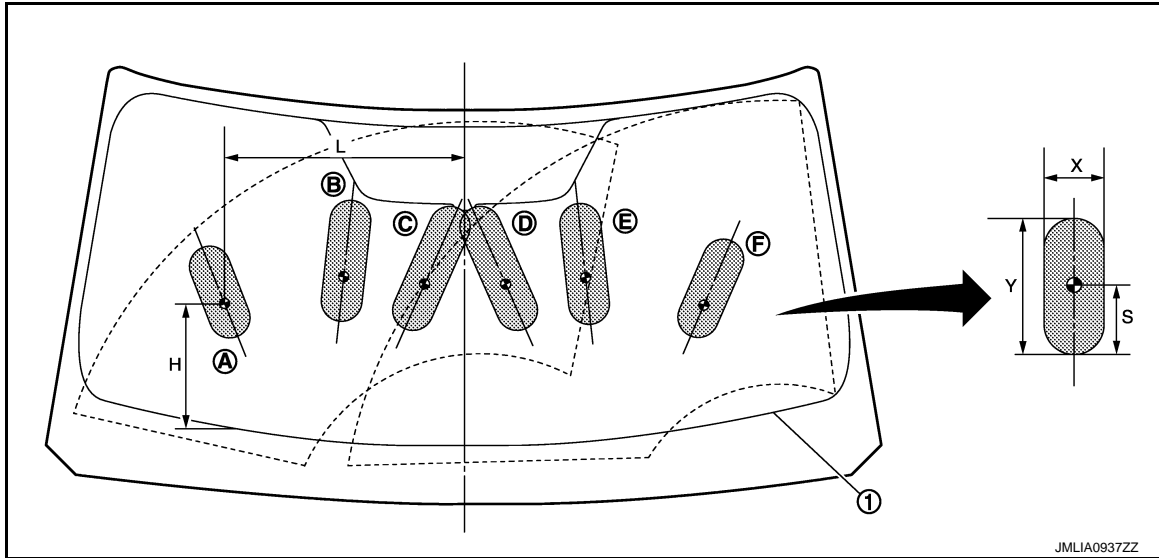
Washer Nozzle Spray Position Adjustment

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




# FRONT WASHER NOZZLE AND TUBE

## < REMOVAL AND INSTALLATION >



1. Black printed frame line

 : Spray area

 : Target spray position

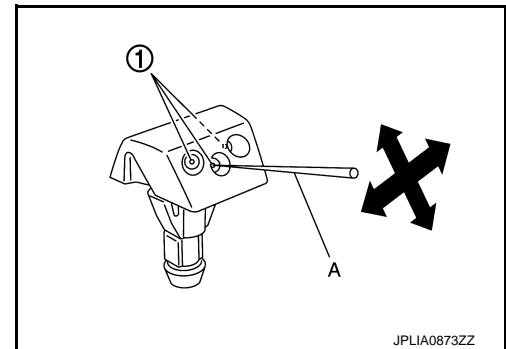
Unit: mm (in)

Spray position	H	L	X	Y	S
A	248.5 (9.78)	480.0 (18.93)	80.0 (3.15)	191.5 (7.54)	68.8 (2.71)
B	331.2 (13.04)	241.6 (9.51)	80.0 (3.15)	237.7 (9.36)	86.6 (3.41)
C	319.9 (12.59)	81.7 (3.22)	80.0 (3.15)	264.8 (10.43)	93.9 (3.70)
D	319.9 (12.59)	81.7 (3.22)	80.0 (3.15)	264.7 (10.42)	93.9 (3.70)
E	331.2 (13.04)	241.6 (9.51)	80.0 (3.15)	237.7 (9.36)	86.6 (3.41)
F	248.5 (9.78)	480.7 (18.93)	80.0 (3.15)	211.4 (8.32)	68.4 (2.70)

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.



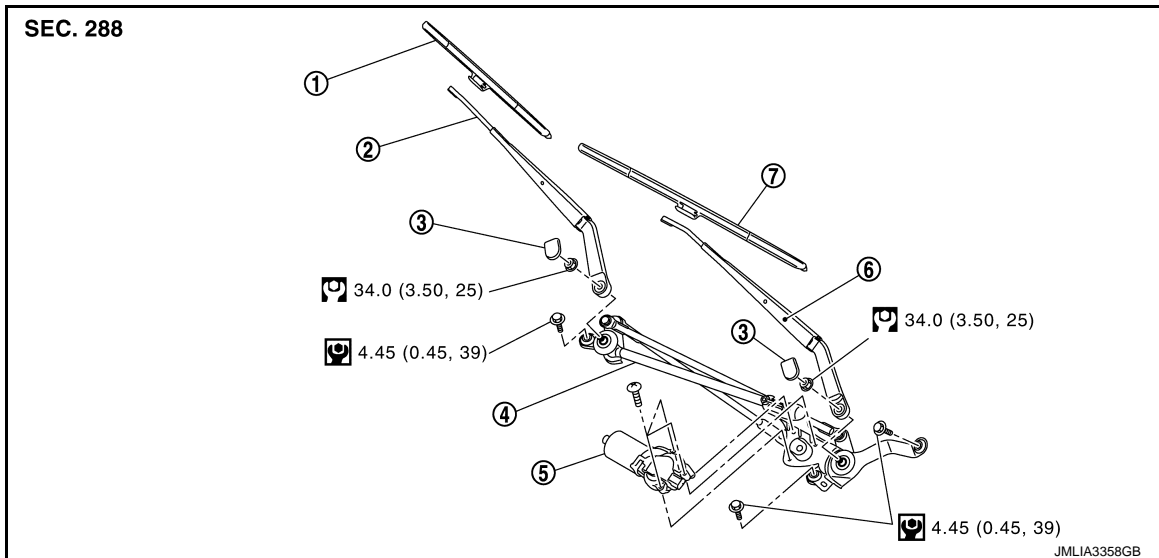
# FRONT WIPER ARM

< REMOVAL AND INSTALLATION >

## FRONT WIPER ARM

Exploded View

INFOID:000000009008156



- |                               |                       |                        |
|-------------------------------|-----------------------|------------------------|
| 1. Front wiper blade RH       | 2. Front wiper arm RH | 3. Front wiper arm cap |
| 4. Front wiper drive assembly | 5. Front wiper motor  | 6. Front wiper arm LH  |
| 7. Front wiper blade LH       |                       |                        |

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

## Removal and Installation

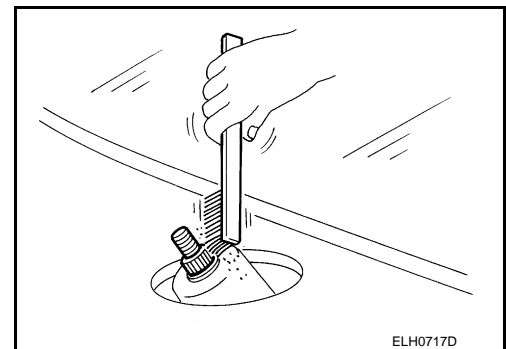
INFOID:000000009008157

### REMOVAL

1. Operate front wiper to move it to the auto stop position.
2. Open the hood.
3. Remove front wiper arm caps.
4. Remove front wiper arm mounting nuts.
5. Raise front wiper arm, and then 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 front wiper motor to move the front wiper to the auto stop position.
3. Adjust front wiper blade position. Refer to [WW-58, "Adjustment"](#).
4. Install front wiper arm by tightening the mounting nuts.
5. Inject the washer fluid.
6. Operate front wiper to move it to the auto stop position.
7. Check that the front wiper blades stop at the specified position.
8. Install front wiper arm caps.



## Adjustment

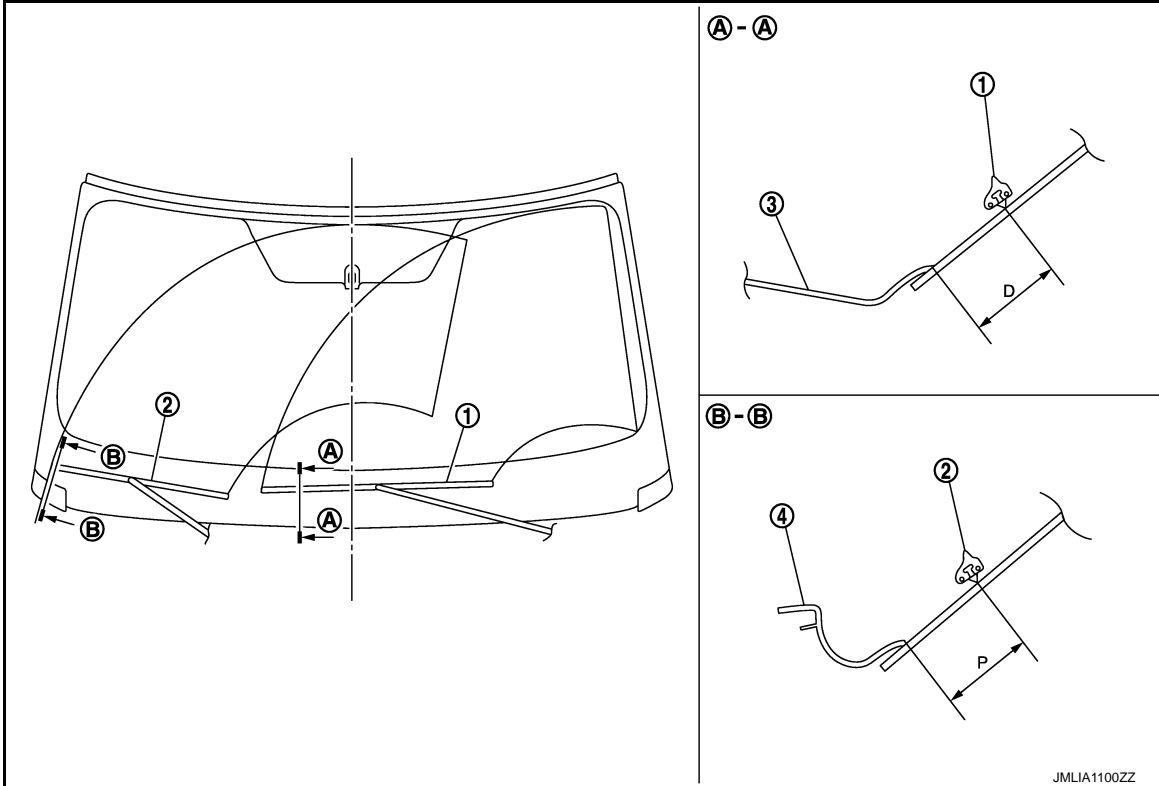
INFOID:000000009008158

## WIPER BLADE POSITION ADJUSTMENT

# FRONT WIPER ARM

## < REMOVAL AND INSTALLATION >

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



1. Wiper blade (Driver side)
2. Wiper blade (Passenger side)
3. Cowl top cover
4. Front fender cover RH

Standard clearance

**P : 51.6 ± 7.5 mm (2.031 ± 0.295 in)**

**D : 53.6 ± 7.5 mm (2.110 ± 0.295 in)**

A  
B  
C  
D  
E  
F  
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H  
I  
J  
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WW  
M  
N  
O  
P

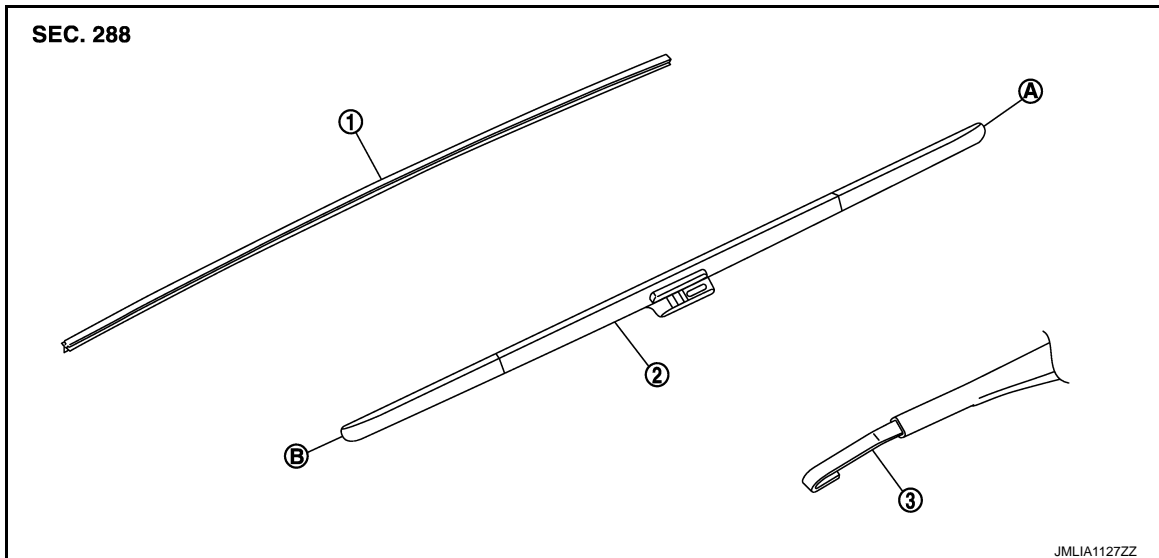
# FRONT WIPER BLADE

< REMOVAL AND INSTALLATION >

## FRONT WIPER BLADE

Exploded View

INFOID:000000009008159



- |                    |                    |              |
|--------------------|--------------------|--------------|
| 1. Wiper refill    | 2. Wiper blade     | 3. Wiper arm |
| A. Wiper blade end | B. Wiper blade tip |              |

## Removal and Installation

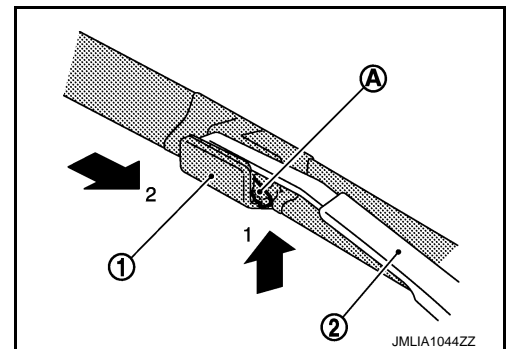
INFOID:000000009008160

### REMOVAL

1. Push up the lever (A) of wiper blade (1), while sliding wiper blade toward the direction of the arrow, to remove it from wiper arm (2).

#### **CAUTION:**

**Be careful not to drop the wiper blade onto the windshield glass.**



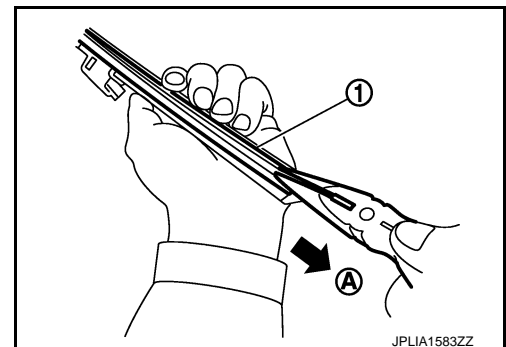
### INSTALLATION

1. Install wiper blade into wiper arm.
2. Install wiper arm.

## Replacement

INFOID:000000009008161

1. Hold the rip of old wiper refill (1) at the rear end of the wiper blade with long-nose pliers, and pull out the wiper refill to the direction (A).



## FRONT WIPER BLADE

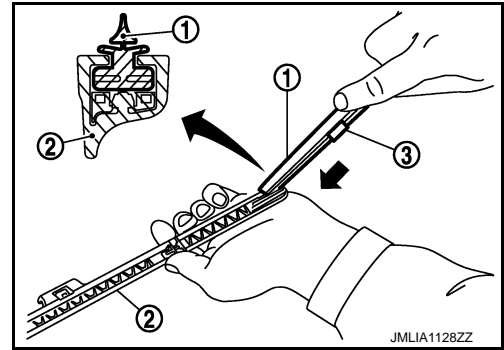
### < REMOVAL AND INSTALLATION >

2. Insert the tip of new wiper refill (1) into the rear end of wiper blade (2). Slide the new wiper refill to the direction shown by the arrow while pressing the new wiper refill onto the wiper blade rear end.

**NOTE:**

- Insert the wiper refill to be held securely by tab of wiper blade as shown in section.
- After the wiper refill is fully inserted, remove the holder\* (3).

\*: Attached to service parts.

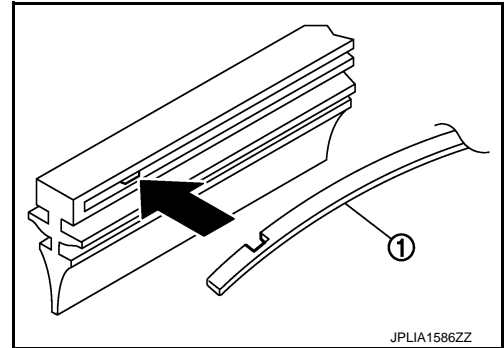
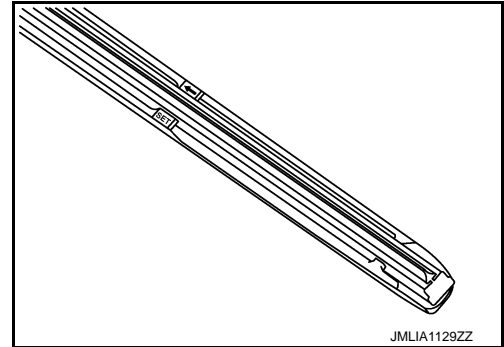


3. Insert the new wiper refill toward the direction shown by the mark "←" until the stopper at the rear end of wiper refill fits in the "SET" mark tab on wiper blade.
4. Untwist the twisted wiper refill at the rear end of wiper blade, if any.
5. Check the following items after replacing wiper refill.
  - Wiper refill is not twisted at all.
  - Wiper refill thoroughly fits in the tab on wiper blade.
  - Wiper refill is inserted from the proper direction.

**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.



A  
B  
C  
D  
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J  
K  
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N  
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P

WW

# FRONT WIPER DRIVE ASSEMBLY

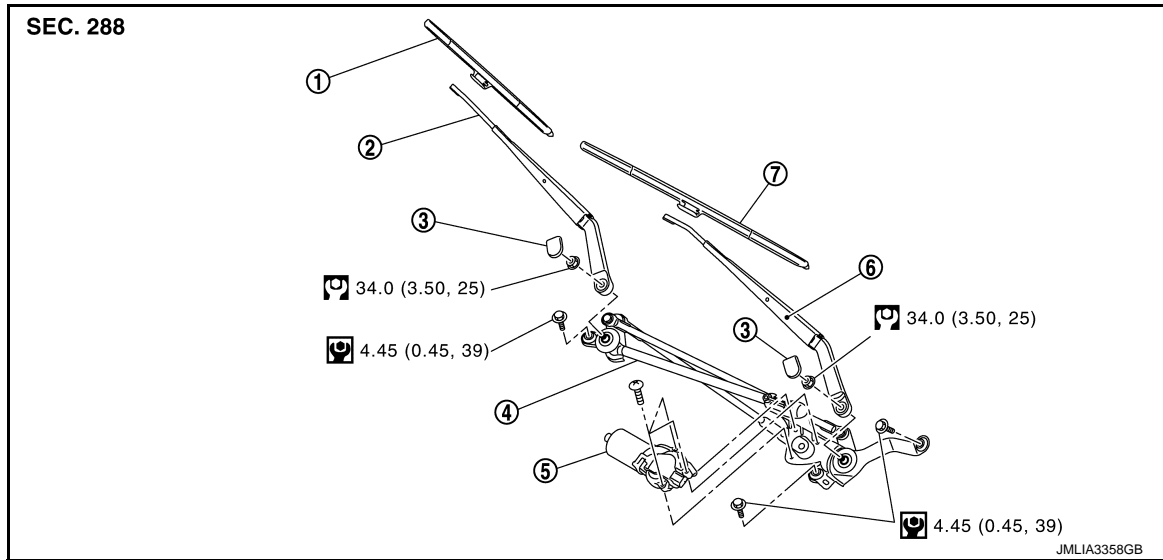
< REMOVAL AND INSTALLATION >

## FRONT WIPER DRIVE ASSEMBLY

Exploded View

INFOID:000000009008162

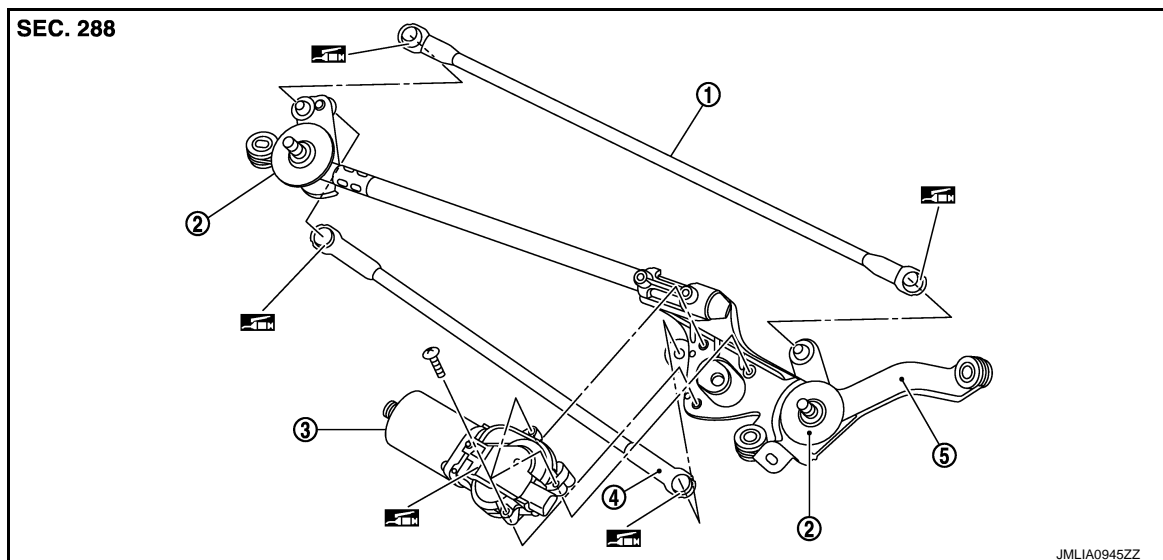
### REMOVAL



- |                               |                       |                        |
|-------------------------------|-----------------------|------------------------|
| 1. Front wiper blade RH       | 2. Front wiper arm RH | 3. Front wiper arm cap |
| 4. Front wiper drive assembly | 5. Front wiper motor  | 6. Front wiper arm LH  |
| 7. Front wiper blade LH       |                       |                        |

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

### DISASSEMBLY



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

: Multi-purpose grease or an equivalent.

### Removal and Installation

INFOID:000000009008163

### REMOVAL

# FRONT WIPER DRIVE ASSEMBLY

## < REMOVAL AND INSTALLATION >

1. Remove front wiper arms (LH and RH). Refer to [WW-58. "Removal and Installation"](#).
2. Remove cowl top cover. Refer to [EXT-21. "Removal and Installation"](#).
3. Disconnect the front wiper motor connector.
4. Remove the mounting bolts from front wiper drive assembly.
5. Remove the front wiper drive assembly from the vehicle.

## INSTALLATION

1. Install the front wiper drive assembly to the vehicle.
2. Connect front wiper motor connector.
3. Operate front wiper to move it to the auto stop position.
4. Install cowl top cover. Refer to [EXT-21. "Removal and Installation"](#).
5. Install front wiper arms. Refer to [WW-58. "Removal and Installation"](#).

## Disassembly and Assembly

INFOID:000000009008164

## 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 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 the front wiper motor to the 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.**

WW

# LIGHT & RAIN SENSOR

< REMOVAL AND INSTALLATION >

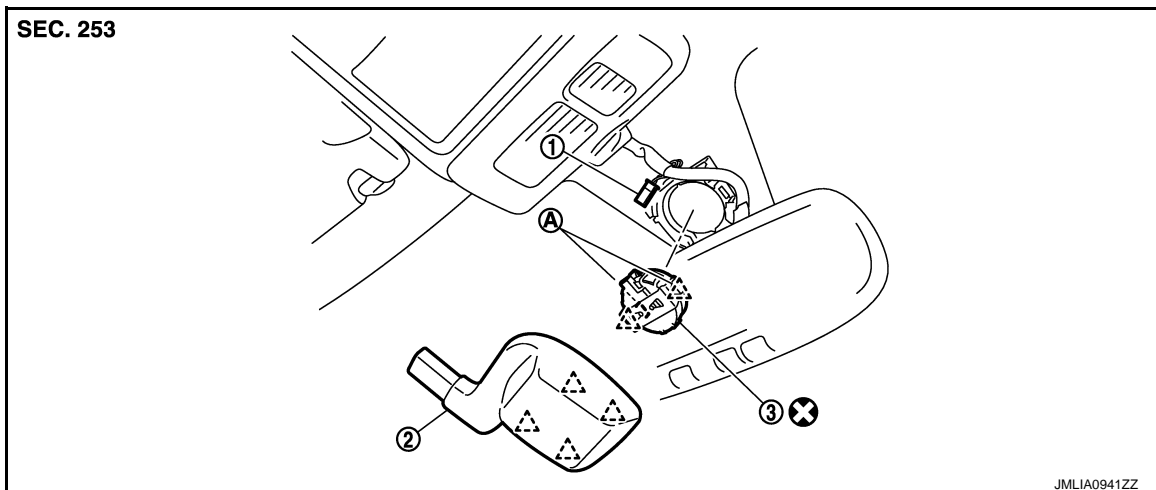
## LIGHT & RAIN SENSOR

Exploded View

INFOID:000000009008165

### CAUTION:

When the light & rain sensor is removed from windshield, the light & rain sensor cannot be re-used.



1. Light & rain sensor connector

2. Light & rain sensor cover

3. Light & rain sensor

A. Metal spring clip

△ : Pawl

⊗ : Do not reuse

## Removal and Installation

INFOID:000000009008166

### REMOVAL

1. Disengage light & rain sensor cover fixing pawls with a remover tool, and then remove rain sensor cover.
2. Disconnect light & rain sensor connector.
3. Disengage both sides metal spring clips, and remove the light & rain sensor from the windshield.

### INSTALLATION

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

### CAUTION:

- Surface of windshield should be cleaned.
- Never touch gel/adhesive of new part.
- Lock the metal spring clips and install the light & rain sensor securely.



# WIPER AND WASHER SWITCH

< REMOVAL AND INSTALLATION >

## WIPER AND WASHER SWITCH

### Exploded View

INFOID:000000009008167

Refer to [BCS-83, "Exploded View"](#).

A  
B  
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WW  
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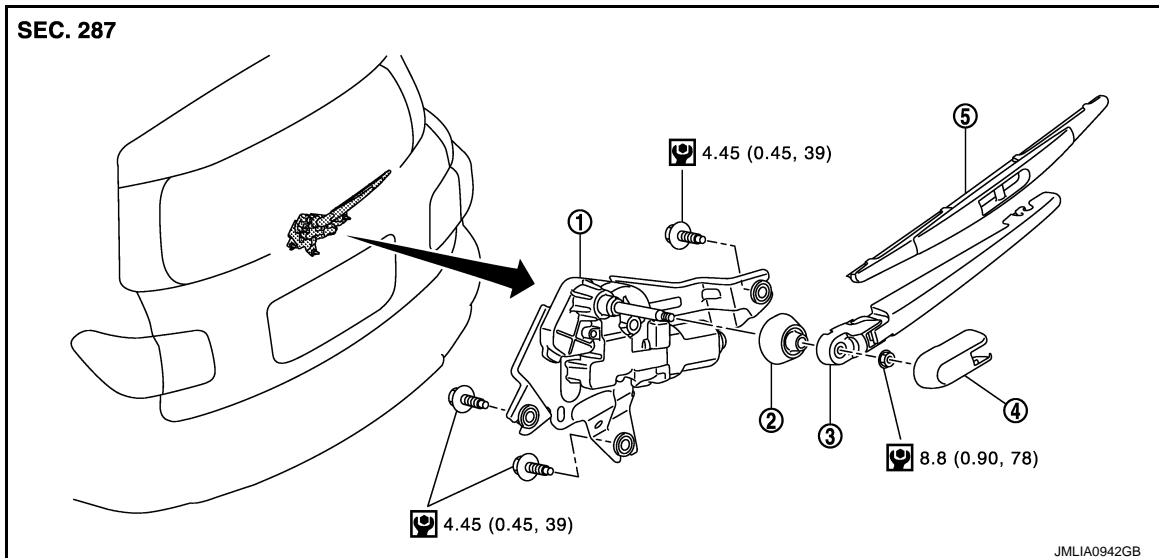
# REAR WIPER ARM

< REMOVAL AND INSTALLATION >

## REAR WIPER ARM

### Exploded View

INFOID:000000009008168



- |                         |                     |                   |
|-------------------------|---------------------|-------------------|
| 1. Rear wiper motor     | 2. Pivot seal       | 3. Rear wiper arm |
| 4. Rear wiper arm cover | 5. Rear wiper blade |                   |

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

### Removal and Installation

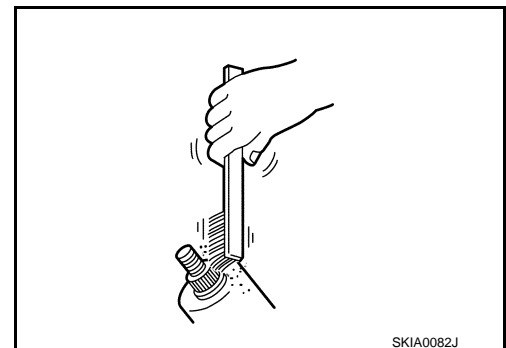
INFOID:000000009008169

#### REMOVAL

1. Operate rear wiper to the auto stop position.
2. Remove rear wiper arm cover.
3. Remove rear wiper arm mounting nut.
4. Remove wiper arm from the vehicle.

#### INSTALLATION

1. Clean wiper arm mount as shown in the figure to prevent nut from being loosened.
2. Operate the rear wiper motor to the auto stop position.
3. Adjust the rear wiper blade position. Refer to [WW-66, "Adjustment"](#).
4. Install the rear wiper arm by tightening the mounting nut.
5. Inject the washer fluid.
6. Operate the rear wiper to the auto stop position.
7. Check that the rear wiper blades stop at the specified position.
8. Install the rear wiper arm cover.



### Adjustment

INFOID:000000009008170

#### REAR WIPER BLADE POSITION ADJUSTMENT

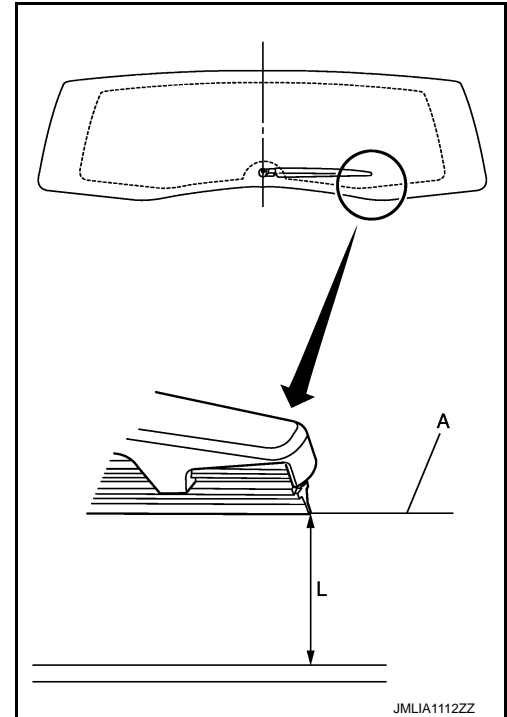
Set the wiper blade top on the defrosting wire (A) (clearance between the end of back door glass and the top of wiper blade center).

## REAR WIPER ARM

### < REMOVAL AND INSTALLATION >

Standard clearance

**L :  $88.5 \pm 7.5 \text{ mm}$  ( $3.484 \pm 0.295 \text{ in}$ )**



A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
WW  
M  
N  
O  
P

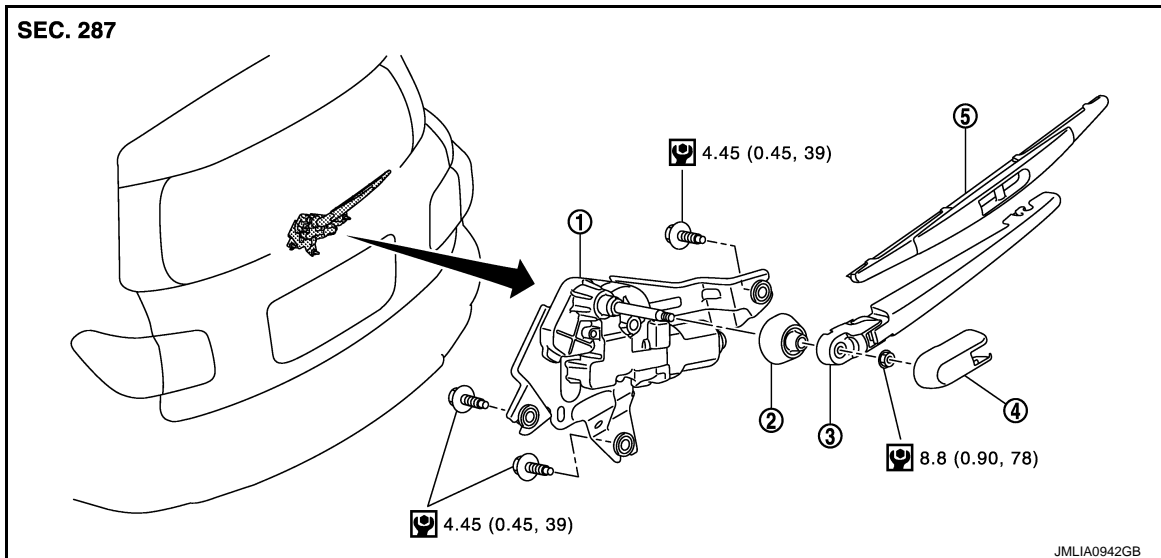
## REAR WIPER MOTOR

< REMOVAL AND INSTALLATION >

### REAR WIPER MOTOR

#### Exploded View

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- |                         |                     |                   |
|-------------------------|---------------------|-------------------|
| 1. Rear wiper motor     | 2. Pivot seal       | 3. Rear wiper arm |
| 4. Rear wiper arm cover | 5. Rear wiper blade |                   |

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

#### Removal and Installation

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##### REMOVAL

1. Remove rear wiper arm. Refer to [WW-66, "Removal and Installation"](#).
2. Remove back door finisher inner. Refer to [INT-38, "Removal and Installation"](#).
3. Disconnect rear wiper motor connector.
4. Remove rear wiper motor mounting bolts.
5. Remove rear wiper motor from the vehicle.
6. Remove the pivot seal.

##### INSTALLATION

Install in the reverse order of removal.

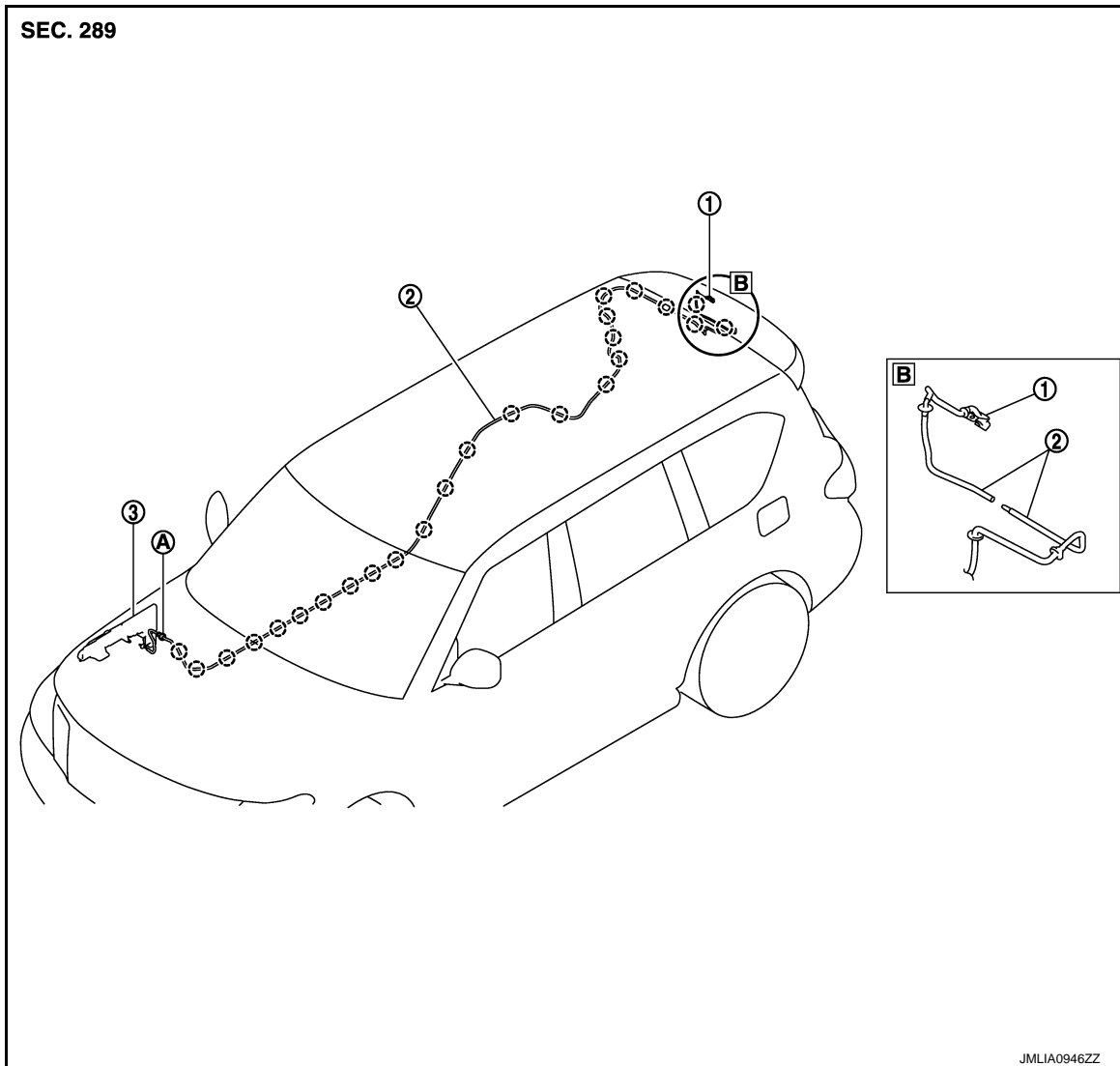
# REAR WASHER NOZZLE AND TUBE

< REMOVAL AND INSTALLATION >

## REAR WASHER NOZZLE AND TUBE

### Hydraulic Layout

INFOID:000000009008173



1. Rear washer nozzle

2. Rear washer tube

3. Washer tank

A : Grommet

○ : Clip

### Removal and Installation

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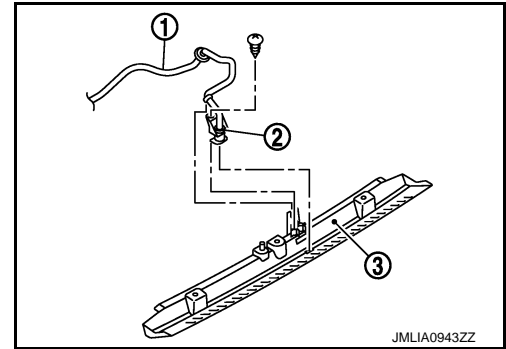
#### REMOVAL

1. Remove rear spoiler. Refer to [EXT-41, "Removal and Installation"](#).
2. Remove high-mounted stop lamp. Refer to [EXL-124, "Removal and Installation"](#).

## REAR WASHER NOZZLE AND TUBE

### < REMOVAL AND INSTALLATION >

3. Remove the screws fixing rear washer nozzle (2) to high-mounted stop lamp cover (3).
4. Disconnect the rear washer tube (1) from the rear washer nozzle.



### INSTALLATION

Install in the reverse order of removal.

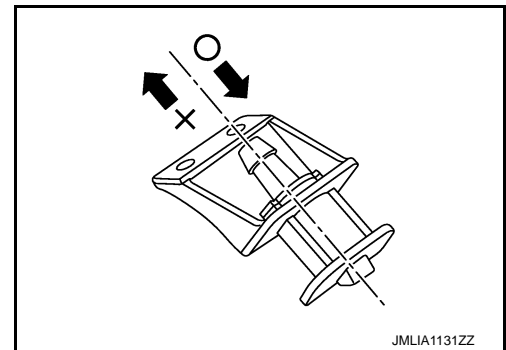
### Inspection and Adjustment

INFOID:000000009008175

### INSPECTION

#### Washer Nozzle 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

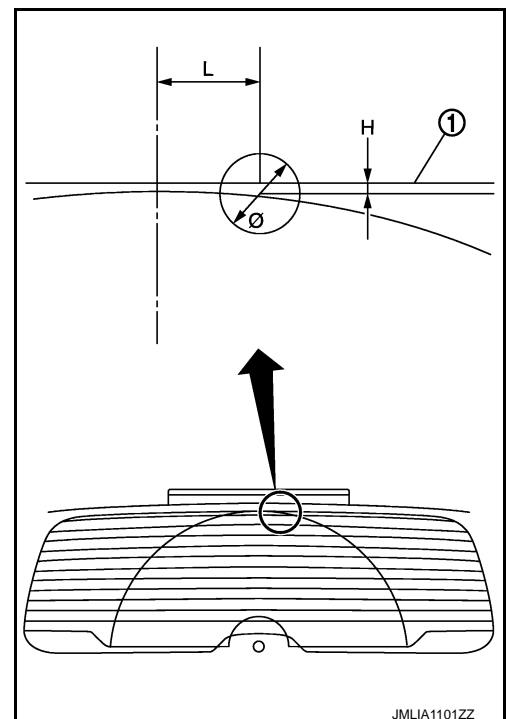
#### Washer Nozzle Spray Position adjustment

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

1 : Black printed frame line

Unit: mm (in)

L : Length	H : Height	$\phi$ : Spray area
40.7 (1.60)	3.9 (0.15)	30 (1.18)



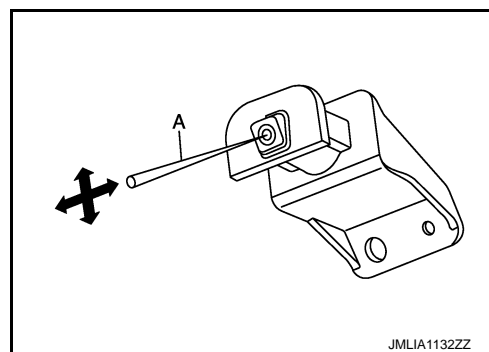
## REAR WASHER NOZZLE AND TUBE

### < REMOVAL AND INSTALLATION >

Insert a needle or similar object (A) into the spray opening 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.



A

B

C

D

E

F

G

H

I

J

K

WW

M

N

O

P