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# SECTION **WW**

## WIPER & WASHER

### CONTENTS

<p><b>BASIC INSPECTION</b> ..... 3</p> <p><b>DIAGNOSIS AND REPAIR WORK FLOW</b> ..... 3</p> <p style="padding-left: 20px;">Work Flow .....3</p> <p><b>SYSTEM DESCRIPTION</b> ..... 6</p> <p><b>FRONT WIPER AND WASHER SYSTEM</b> ..... 6</p> <p style="padding-left: 20px;">System Diagram .....6</p> <p style="padding-left: 20px;">System Description .....6</p> <p style="padding-left: 20px;">Component Parts Location .....9</p> <p style="padding-left: 20px;">Component Description .....9</p> <p><b>REAR WIPER AND WASHER SYSTEM</b> .....11</p> <p style="padding-left: 20px;">System Diagram ..... 11</p> <p style="padding-left: 20px;">System Description ..... 11</p> <p style="padding-left: 20px;">Component Parts Location ..... 13</p> <p style="padding-left: 20px;">Component Description ..... 13</p> <p><b>DIAGNOSIS SYSTEM (BCM)</b> .....14</p> <p><b>COMMON ITEM</b> ..... 14</p> <p style="padding-left: 20px;">COMMON ITEM : CONSULT Function (BCM - COMMON ITEM) ..... 14</p> <p><b>WIPER</b> ..... 14</p> <p style="padding-left: 20px;">WIPER : CONSULT Function (BCM - WIPER) ..... 15</p> <p><b>DIAGNOSIS SYSTEM (IPDM E/R)</b> .....16</p> <p style="padding-left: 20px;">Diagnosis Description ..... 16</p> <p style="padding-left: 20px;">CONSULT Function (IPDM E/R) ..... 18</p> <p><b>DTC/CIRCUIT DIAGNOSIS</b> .....21</p> <p><b>FRONT WIPER MOTOR LO CIRCUIT</b> .....21</p> <p style="padding-left: 20px;">Component Function Check .....21</p> <p style="padding-left: 20px;">Diagnosis Procedure .....21</p> <p><b>FRONT WIPER MOTOR HI CIRCUIT</b> .....22</p> <p style="padding-left: 20px;">Component Function Check .....22</p> <p style="padding-left: 20px;">Diagnosis Procedure .....22</p>	<p style="text-align: right;">D E F G H I J K M N O P</p> <p><b>FRONT WIPER STOP POSITION SIGNAL CIRCUIT</b> .....23</p> <p style="padding-left: 20px;">Component Function Check .....23</p> <p style="padding-left: 20px;">Diagnosis Procedure .....23</p> <p><b>FRONT WIPER MOTOR GROUND CIRCUIT</b> ...24</p> <p style="padding-left: 20px;">Diagnosis Procedure .....24</p> <p><b>WASHER SWITCH</b> .....25</p> <p style="padding-left: 20px;">Description .....25</p> <p style="padding-left: 20px;">Component Inspection .....25</p> <p><b>REAR WIPER MOTOR CIRCUIT</b> .....26</p> <p style="padding-left: 20px;">Component Function Check .....26</p> <p style="padding-left: 20px;">Diagnosis Procedure .....26</p> <p><b>REAR WIPER STOP POSITION SIGNAL CIRCUIT</b> .....28</p> <p style="padding-left: 20px;">Component Function Check .....28</p> <p style="padding-left: 20px;">Diagnosis Procedure .....28</p> <p><b>FRONT WIPER AND WASHER SYSTEM</b> .....29</p> <p style="padding-left: 20px;">Wiring Diagram - FRONT WIPER AND WASHER SYSTEM - .....29</p> <p><b>REAR WIPER AND WASHER SYSTEM</b> .....31</p> <p style="padding-left: 20px;">Wiring Diagram - REAR WIPER AND WASHER SYSTEM - .....31</p> <p><b>ECU DIAGNOSIS INFORMATION</b> .....32</p> <p><b>BCM, IPDM E/R</b> .....32</p> <p style="padding-left: 20px;">List of ECU Reference .....32</p> <p><b>SYMPTOM DIAGNOSIS</b> .....33</p> <p><b>WIPER AND WASHER SYSTEM SYMPTOMS</b> .....33</p> <p style="padding-left: 20px;">Symptom Table .....33</p> <p><b>NORMAL OPERATING CONDITION</b> .....36</p> <p style="padding-left: 20px;">Description .....36</p>
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<b>FRONT WIPER DOES NOT OPERATE</b> .....	<b>37</b>	Removal and Installation .....	44
Description .....	37		
Diagnosis Procedure .....	37		
<b>PRECAUTION</b> .....	<b>39</b>	<b>FRONT WASHER NOZZLE AND TUBE</b> .....	<b>45</b>
<b>PRECAUTIONS</b> .....	<b>39</b>	Exploded View .....	45
<b>FOR USA AND CANADA</b> .....	<b>39</b>	Hydraulic Layout .....	45
FOR USA AND CANADA : Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" .....	39	Removal and Installation .....	45
FOR USA AND CANADA : Precaution for Procedure without Cowl Top Cover .....	39	Inspection and Adjustment .....	46
FOR USA AND CANADA : Precautions For Xenon Headlamp Service .....	39	<b>FRONT WIPER ARM</b> .....	<b>48</b>
<b>FOR MEXICO</b> .....	<b>40</b>	Exploded View .....	48
FOR MEXICO : Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" .....	40	Removal and Installation .....	48
FOR MEXICO : Precaution for Procedure without Cowl Top Cover .....	40	Adjustment .....	48
FOR MEXICO : Precautions For Xenon Headlamp Service .....	40	<b>FRONT WIPER DRIVE ASSEMBLY</b> .....	<b>50</b>
<b>REMOVAL AND INSTALLATION</b> .....	<b>42</b>	Exploded View .....	50
<b>WASHER TANK</b> .....	<b>42</b>	Removal and Installation .....	50
Exploded View .....	42	Disassembly and Assembly .....	51
Removal and Installation .....	42	<b>WIPER AND WASHER SWITCH</b> .....	<b>52</b>
<b>WASHER PUMP</b> .....	<b>43</b>	Exploded View .....	52
Exploded View .....	43	Removal and Installation .....	52
Removal and Installation .....	43	<b>REAR WIPER ARM</b> .....	<b>53</b>
<b>WASHER LEVEL SWITCH</b> .....	<b>44</b>	Exploded View .....	53
		Removal and Installation .....	53
		Adjustment .....	53
		<b>REAR WIPER MOTOR</b> .....	<b>55</b>
		Exploded View .....	55
		Removal and Installation .....	55
		<b>REAR WASHER NOZZLE AND TUBE</b> .....	<b>56</b>
		Exploded View .....	56
		Hydraulic Layout .....	57
		Removal and Installation .....	57
		Inspection and Adjustment .....	58

# DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

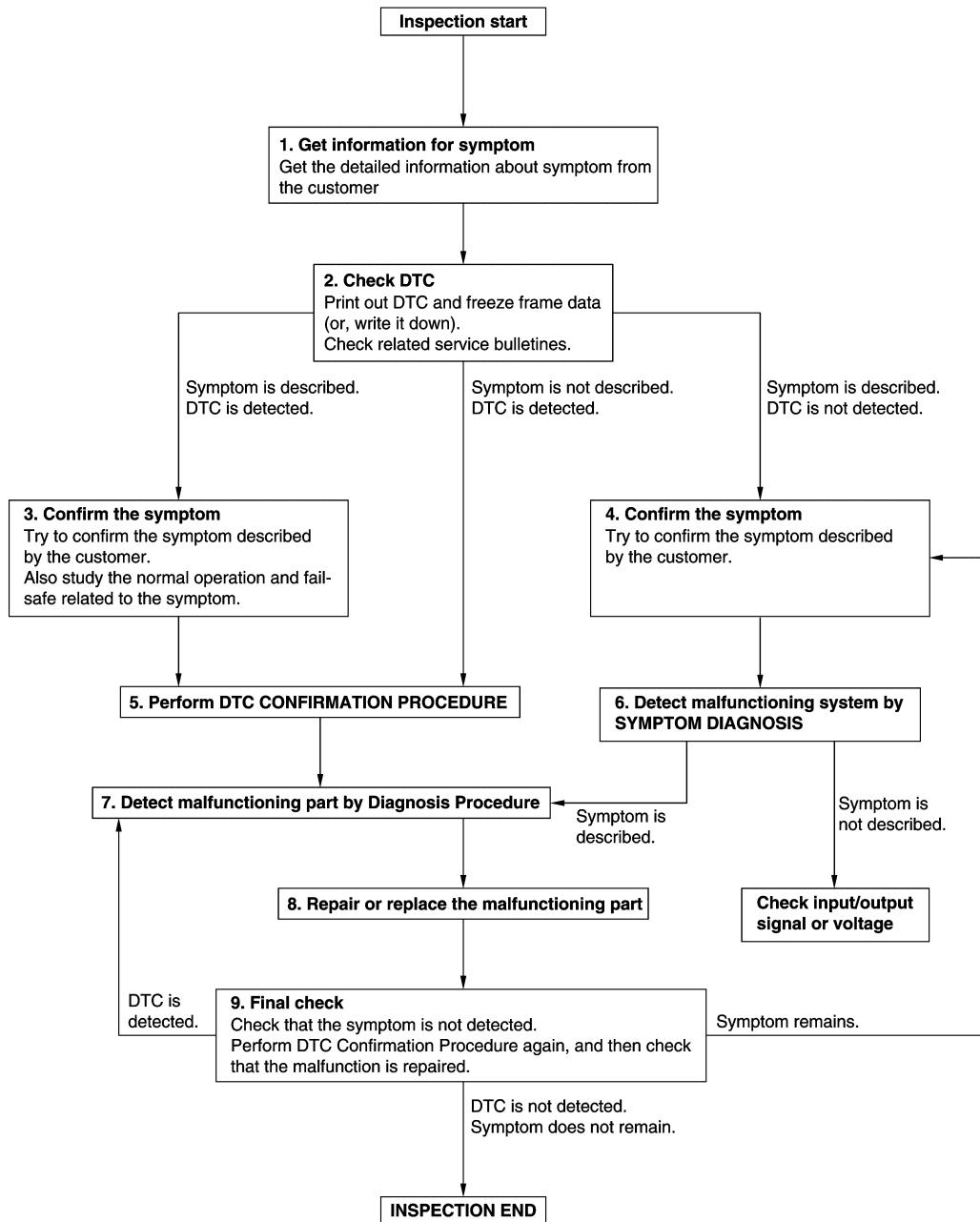
## BASIC INSPECTION

### DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:000000008277763

OVERALL SEQUENCE



DETAILED FLOW

JMKIA8652GB

# DIAGNOSIS AND REPAIR WORK FLOW

## < BASIC INSPECTION >

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### 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-61. "DTC Inspection Priority Chart"](#) (BCM) or [PCS-25. "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-46. "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-46. "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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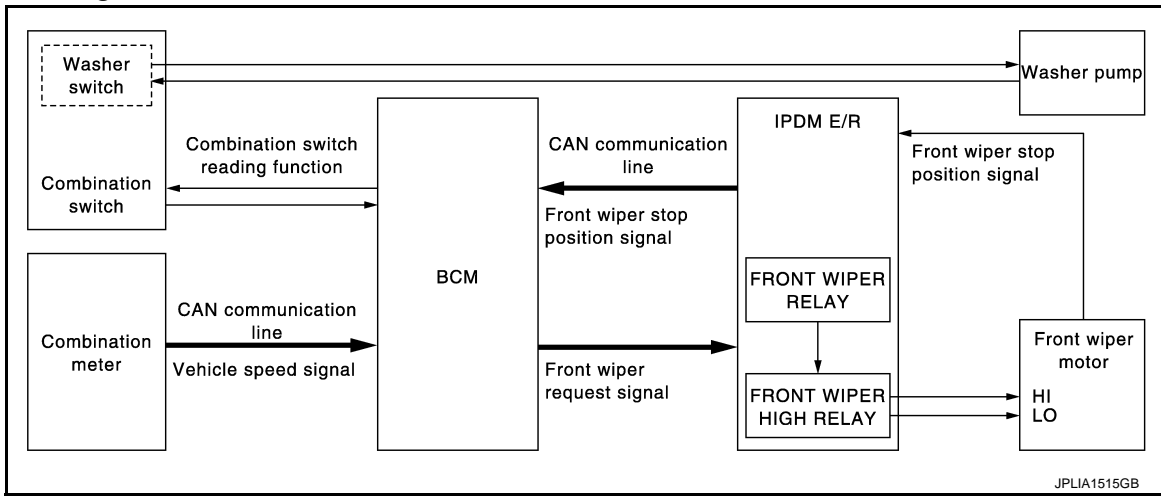
# FRONT WIPER AND WASHER SYSTEM

< SYSTEM DESCRIPTION >

## SYSTEM DESCRIPTION

### FRONT WIPER AND WASHER SYSTEM

#### System Diagram



#### System Description

INFOID:000000008277765

#### 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

For Canada: Combination meter indicates low washer fluid level warning judged by the signal from the washer level switch.

For details of low washer fluid level warning, refer to [MWI-14, "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 with CAN communication depending on each operating condition of the front wiper.
- IPDM E/R turns ON/OFF the integrated front wiper relay and the front wiper high relay according to the front wiper request signal. IPDM E/R provides the power supply to operate the front wiper HI/LO operation.

#### FRONT WIPER LO OPERATION

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

##### Front wiper LO operating condition

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

#### FRONT WIPER HI OPERATION

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

##### Front wiper HI operating condition

- Ignition switch ON
- Front wiper switch HI

# FRONT WIPER AND WASHER SYSTEM

## < SYSTEM DESCRIPTION >

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

### FRONT WIPER INT OPERATION (LINKED WITH VEHICLE SPEED)

- BCM transmits the front wiper request signal (INT) to IPDM E/R with CAN communication according to the front wiper INT operation condition and the intermittent operation delay interval judged value.

Front wiper INT operating condition

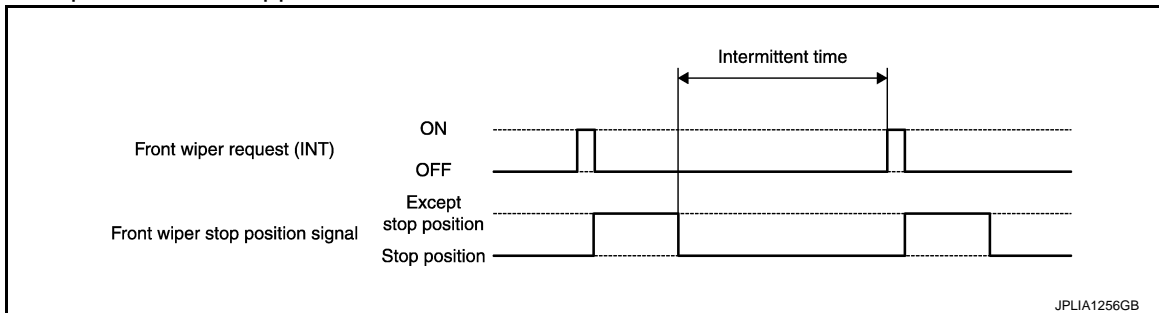
- Ignition switch ON
- Front wiper switch INT

Intermittent operation delay interval judgment

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

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

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



### NOTE:

Factory setting of the front wiper intermittent operation is operation linked with vehicle speed. Front wiper intermittent operation can be set to operation linked or linked with vehicle speed using CONSULT. Refer to [WW-15, "WIPER : CONSULT Function \(BCM - WIPER\)"](#).

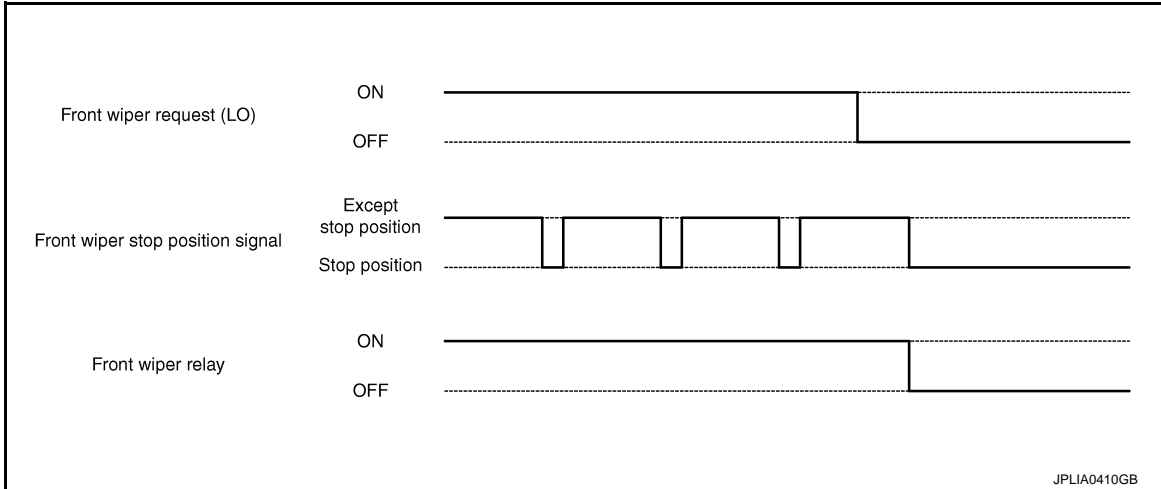
### FRONT WIPER AUTO STOP OPERATION

- 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).

# FRONT WIPER AND WASHER SYSTEM

## < SYSTEM DESCRIPTION >

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



### NOTE:

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

### FRONT WIPER OPERATION LINKED WITH WASHER

- BCM transmits the front wiper request signal (LO) to IPDM E/R with CAN communication according to the washer linked operating condition of the front wiper.
- BCM transmits the front wiper request signal (LO) so that the front wiper operates approximately 3 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 FAIL-SAFE OPERATION

IPDM E/R performs the fail-safe function when the front wiper auto stop circuit is malfunctioning. Refer to [PCS-23. "Fail-safe"](#).

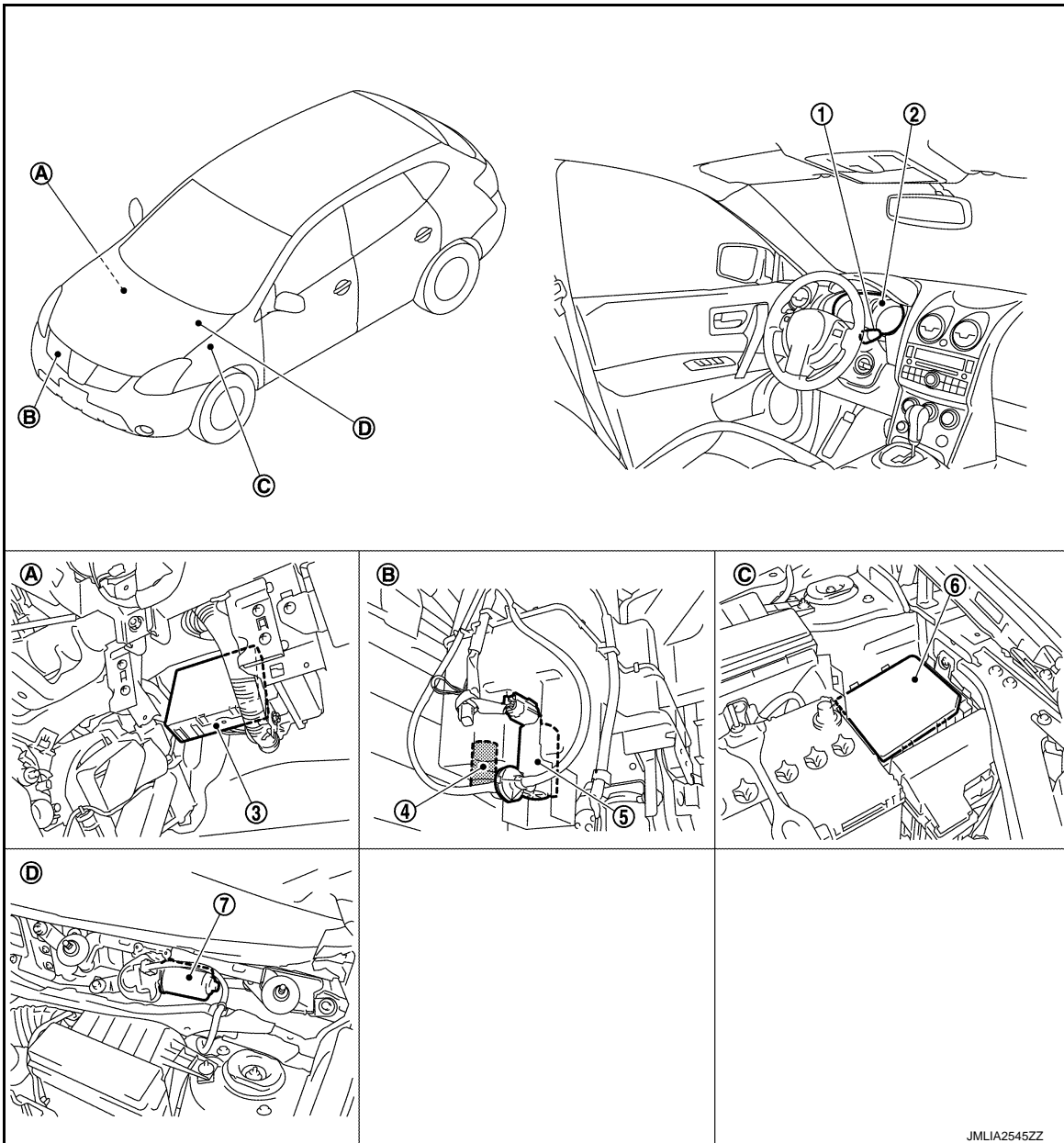


# FRONT WIPER AND WASHER SYSTEM

< SYSTEM DESCRIPTION >

## Component Parts Location

INFOID:000000008277766



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

\*: For Canada

## Component Description

INFOID:000000008277767

Part	Description
BCM	<ul style="list-style-type: none"> <li>Judges each switch status by the combination switch reading function.</li> <li>Requests (via CAN communication) front wiper relay and front wiper high relay ON to IPDM E/R.</li> </ul>
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 auto stop control of front wiper.</li> </ul>

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## FRONT WIPER AND WASHER SYSTEM

### < SYSTEM DESCRIPTION >

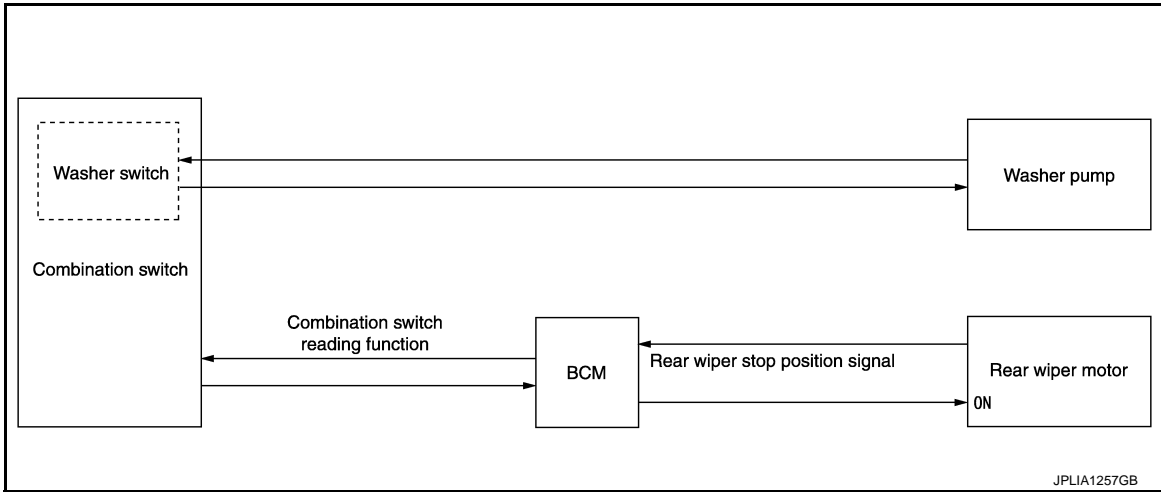
Part	Description
Combination switch (Wiper & washer switch)	Refer to <a href="#">BCS-9, "System Diagram"</a> .
Combination meter	Transmits the vehicle speed signal to BCM with CAN communication.
Front wiper motor	Controls front wiper operation with IPDM E/R control.
Washer level switch	Detects the low level of washer fluid.
Washer pump	Washer fluid is sprayed according to washer switch states.

# REAR WIPER AND WASHER SYSTEM

< SYSTEM DESCRIPTION >

## REAR WIPER AND WASHER SYSTEM

### System Diagram



### System Description

INFOID:000000008277769

#### OUTLINE

The rear wiper is controlled by each function of BCM.

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

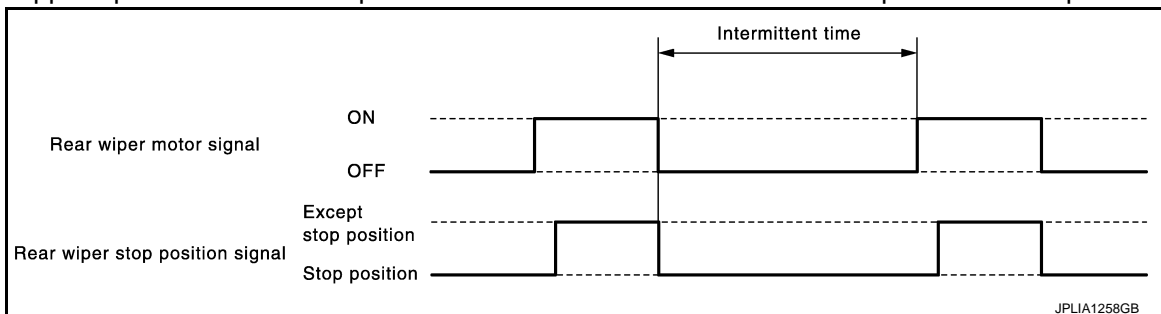
- Ignition switch ON
- Rear wiper switch ON

#### 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 stopping position.
- BCM supplies power to the rear wiper motor after an intermittent from the stop of the rear wiper motor.



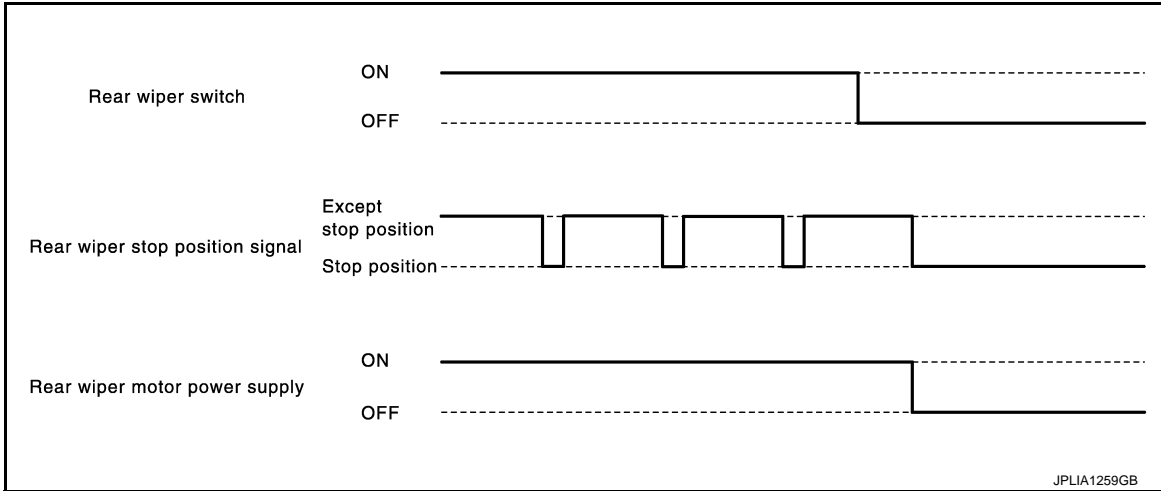
#### REAR WIPER AUTO STOP OPERATION

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

# REAR WIPER AND WASHER SYSTEM

## < SYSTEM DESCRIPTION >

- BCM reads a 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.

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 FAIL-SAFE OPERATION

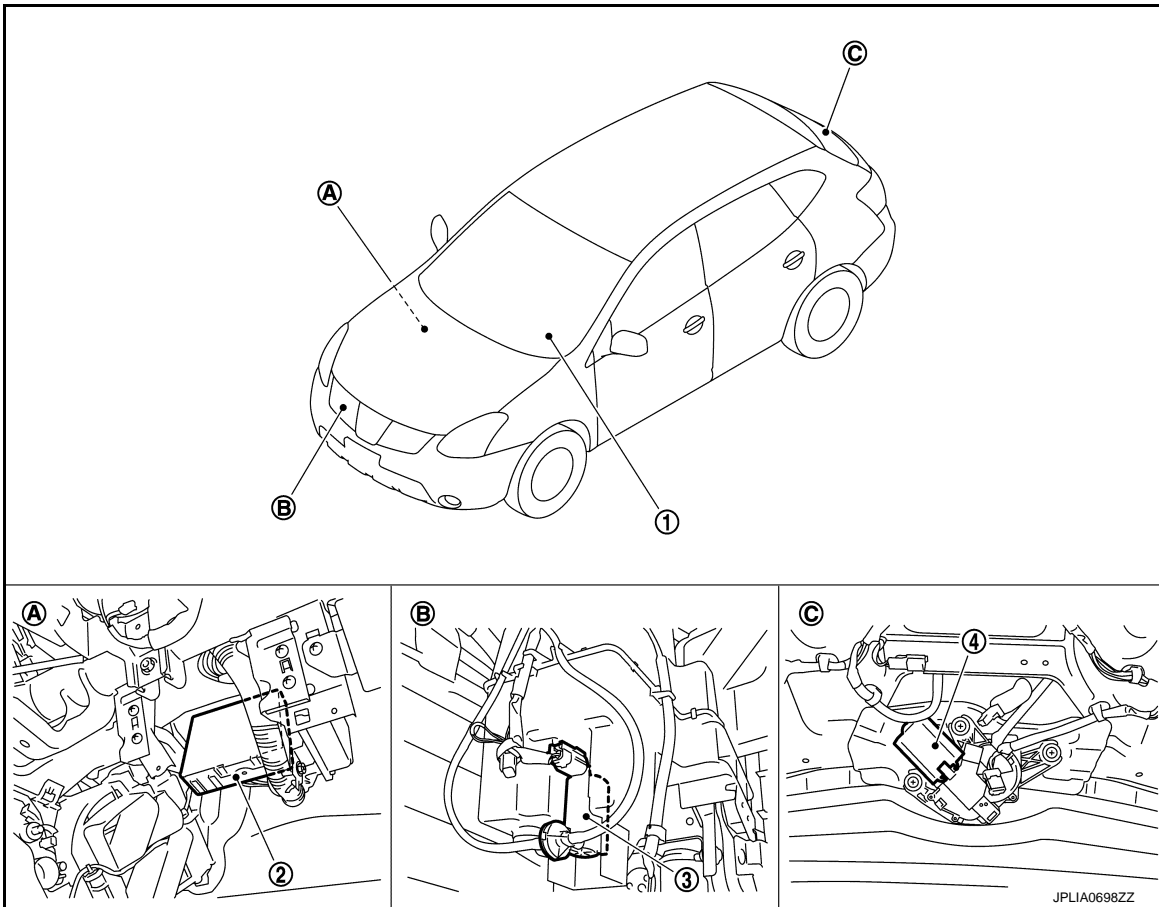
BCM performs the fail-safe function when the rear wiper auto stop circuit is malfunctioning. Refer to [BCS-60](#), "[Fail-safe](#)".

# REAR WIPER AND WASHER SYSTEM

< SYSTEM DESCRIPTION >

## Component Parts Location

INFOID:000000008277770



1. Combination switch

2. BCM

3. Washer pump

4. Rear wiper motor

B. Radiator core support (RH)

C. Back door trim finisher lower inside

A. Over the glove box

## Component Description

INFOID:000000008277771

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Part	Description
BCM	<ul style="list-style-type: none"> <li>Judges each switch status by the combination switch reading function.</li> <li>Supplies power to the rear wiper motor.</li> <li>Performs the auto stop control of the rear wiper.</li> </ul>
Combination switch (Wiper & washer switch)	Refer to <a href="#">BCS-9, "System Diagram"</a> .
Washer pump	Washer fluid is sprayed according to washer switch states.
Rear wiper motor	Controls rear wiper operation with BCM control.

# DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

## DIAGNOSIS SYSTEM (BCM)

### COMMON ITEM

COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)

INFOID:000000008277772

### APPLICATION ITEM

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

Diagnosis mode	Function description
ECU Identification	BCM part number is displayed.
Self-Diagnostic Result	Displays the diagnosis results judged by BCM. Refer to <a href="#">BCS-61, "DTC Index"</a> .
Data Monitor	BCM input/output signals are displayed.
Active Test	The signals used to activate each device are forcibly supplied from BCM.
Work Support	Changes the setting for each system function.
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>
CAN Diag Support Monitor	Monitors the reception status of CAN communication viewed from BCM.

### SYSTEM APPLICATION

BCM can perform the following functions for each system.

#### NOTE:

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

×: Applicable item

System	CONSULT 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 control	INT LAMP	×	×	×
Remote keyless entry system	MULTI REMOTE ENT	×	×	×
Exterior lamp	HEAD LAMP	×	×	×
Wiper and washer	WIPER	×	×	×
Turn signal and hazard warning lamps	FLASHER		×	×
<ul style="list-style-type: none"> <li>Auto air conditioning system</li> <li>Manual air conditioning system</li> </ul>	AIR CONDITONER		×	
Intelligent Key system	INTELLIGENT KEY		×	
Combination switch	COMB SW		×	
Body control system	BCM	×		
Immobilizer	IMMU		×	×
Interior room lamp battery saver	BATTERY SAVER	×	×	×
Back door open	TRUNK		×	×
Vehicle security system	THEFT ALM	×	×	×
RAP system	RETAINED PWR	×	×	×
Signal buffer system	SIGNAL BUFFER		×	×
—	FUEL LID*			
TPMS	AIR PRESSURE MONITOR	×	×	×
Panic alarm system	PANIC ALARM			×

\*: This item is displayed, but is not function.

## WIPER

# DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

## WIPER : CONSULT Function (BCM - WIPER)

INFOID:000000008277773

### WORK SUPPORT

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

\*:Factory setting

### DATA MONITOR

Monitor Item [Unit]	Description
IGN ON SW [On/Off]	Ignition switch ON status judged from ignition power supply.
IGN SW CAN [On/Off]	Ignition switch ON status received from IPDM E/R with CAN communication.
FR WIPER HI [On/Off]	Each switch status that BCM judges from the combination switch reading function.
FR WIPER LOW [On/Off]	
FR WIPER INT [On/Off]	
FR WASHER SW [On/Off]	
INT VOLUME [1 - 7]	Each switch status that BCM judges from the combination switch reading function.
FR WIPER STOP [On/Off]	Front wiper motor (stop position) status received from IPDM E/R with CAN communication.
VEHICLE SPEED [km/h]	The value of the vehicle speed signal received from combination meter with CAN communication.
RR WIPER ON [On/Off]	Each switch status that BCM judges from the combination switch reading function.
RR WIPER INT [On/Off]	
RR WASHER SW [On/Off]	
RR WIPER STOP [On/Off]	Rear wiper motor (stop position) status input from the rear wiper motor.

### ACTIVE TEST

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

# DIAGNOSIS SYSTEM (IPDM E/R)

< SYSTEM DESCRIPTION >

## DIAGNOSIS SYSTEM (IPDM E/R)

### Diagnosis Description

INFOID:000000008277774

#### Auto active test

##### Description

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

- Oil pressure warning lamp
- 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)
- Cooling fan (LO, MID, HI)

##### Operation procedure

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. Then the horn sounds once and the auto active test starts.

**NOTE:**

Only a vehicle with the vehicle security system, the horn sounds.

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 mode has to be cancelled halfway through test, turn the ignition switch OFF.

**CAUTION:**

- **If auto active test mode cannot be actuated, check door switch system.**
- **Never start the engine.**

##### Inspection in auto active test mode

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

Operation sequence	Inspection location	Operation
A	Oil pressure warning lamp	Blinks continuously during operation of auto active test.
1	Rear window defogger	10 seconds
2	Front wiper motor	LO for 5 seconds → HI for 5 seconds
3	<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>• Headlamps HI (daytime running light operation)*</li></ul>	10 seconds
4	Headlamp	LO 10 seconds → ↔ OFF 5 times
5	A/C compressor (magnet clutch)	ON ↔ OFF 5 times
6	Cooling fan	LO for 5 seconds → MID for 3 seconds → HI for 2 seconds



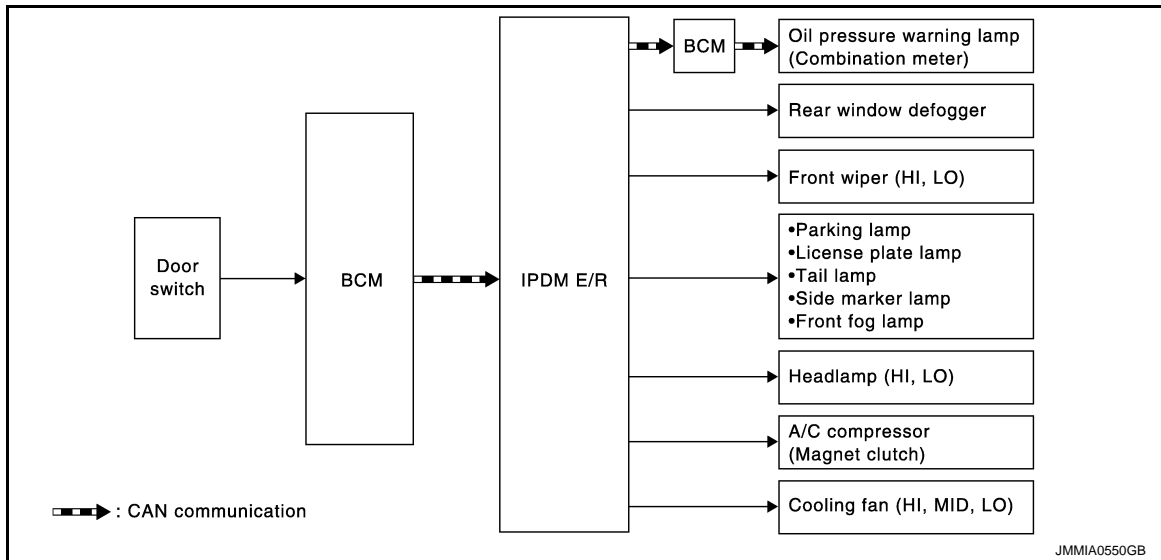
# DIAGNOSIS SYSTEM (IPDM E/R)

## < SYSTEM DESCRIPTION >

### NOTE:

\*: With daytime running light system

### Concept of auto active test



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

### Diagnosis chart in auto active test mode

Symptom	Inspection contents	Possible cause
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 • Parking lamp • License plate lamp • Tail lamp • Side marker lamp • Front fog lamp • Headlamp (HI, LO) • Front wiper motor (HI, LO)	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>
Headlamps HI (daytime running light operation) do not operate	Perform auto active test. Do headlamps HI (daytime running light operation) operate?	YES <ul style="list-style-type: none"> <li>• CAN communication signal between ECM and BCM</li> <li>• CAN communication signal between combination meter and BCM</li> <li>• BCM signal input circuit</li> </ul>
		NO <ul style="list-style-type: none"> <li>• Daytime running light relay power supply circuit</li> <li>• Harness or connector between IPDM E/R and daytime running light relay</li> <li>• Daytime running light relay</li> </ul>

# DIAGNOSIS SYSTEM (IPDM E/R)

## < SYSTEM DESCRIPTION >

Symptom	Inspection contents	Possible cause
A/C compressor does not operate	Perform auto active test. Does the magnet clutch operate?	YES <ul style="list-style-type: none"> <li>• BCM signal input circuit</li> <li>• CAN communication signal between BCM 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>
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>
Cooling fan does not operate	Perform auto active test. Does the cooling fan operate?	YES <ul style="list-style-type: none"> <li>• ECM signal input circuit</li> <li>• CAN communication signal between ECM and IPDM E/R</li> </ul>
		NO <ul style="list-style-type: none"> <li>• Cooling fan motor-2 power supply circuit</li> <li>• Cooling fan motor-1 ground circuit</li> <li>• Cooling fan relay-4 or cooling fan relay-5 power supply circuit</li> <li>• Cooling fan relay-5 ground circuit</li> <li>• Harness or connector between IPDM E/R and cooling fan motor</li> <li>• Harness or connector between IPDM E/R, and cooling fan relay-4 or cooling fan relay-5</li> <li>• Harness or connector between cooling fan motor-2, and cooling fan relay-4 or cooling fan relay-5</li> <li>• Cooling fan relay-4 or cooling fan relay-5</li> <li>• Cooling fan motor</li> <li>• IPDM E/R</li> </ul>

## CONSULT Function (IPDM E/R)

INFOID:000000008277775

### APPLICATION ITEM

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

Diagnosis mode	Description
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

Refer to [PCS-25. "DTC Index"](#).

### DATA MONITOR

Monitor item

# DIAGNOSIS SYSTEM (IPDM E/R)

## < SYSTEM DESCRIPTION >

Monitor Item [Unit]	MAIN SIGNALS	Description	A
MOTOR FAN REQ [1 - 4]	×	Displays the value of the cooling fan speed signal received from ECM via CAN communication.	B
AC COMP REQ [Off/On]	×	Displays the status of the A/C compressor request signal received from ECM via CAN communication.	C
TAIL&CLR REQ [Off/On]	×	Displays the status of the position light request signal received from BCM via CAN communication.	D
HL LO REQ [Off/On]	×	Displays the status of the low beam request signal received from BCM via CAN communication.	E
HL HI REQ [Off/On]	×	Displays the status of the high beam request signal received from BCM via CAN communication.	F
FR FOG REQ [Off/On]	×	Displays the status of the front fog light request signal received from BCM via CAN communication. <b>NOTE:</b> This item is monitored only the vehicle with front fog lamp system.	G
FR WIP REQ [Stop/1LOW/Low/Hi]	×	Displays the status of the front wiper request signal received from BCM via CAN communication.	H
WIP AUTO STOP [STOP P/ACT P]	×	Displays the status of the front wiper stop position signal judged by IPDM E/R.	I
WIP PROT [Off/BLOCK]	×	Displays the status of the front wiper fail-safe operation judged by IPDM E/R.	J
ST RLY REQ [Off/On]		Displays the status of the starter request signal.	K
IGN RLY [Off/On]	×	Displays the status of the ignition relay judged by IPDM E/R.	L
RR DEF REQ [Off/On]	×	Displays the status of the rear defogger request signal received from BCM via CAN communication.	M
OIL P SW [Open/Close]		Displays the status of the oil pressure switch judged by IPDM E/R.	N
DTRL REQ [Off/On]		Displays the status of the daytime running light request signal received from BCM via CAN communication. <b>NOTE:</b> This item is monitored only the vehicle with daytime running light system.	O
HOOD SW [Off/On]		Displays the status of the hood switch judged by IPDM E/R. <b>NOTE:</b> This item is monitored only the vehicle for Mexico.	P
THFT HRN REQ [Off/On]		Displays the status of the horn request signal by vehicle security system or panic alarm system received from BCM via CAN communication.	Q
HORN CHIRP [Off/On]		Displays the status of the horn request signal by key fob LOCK operation received from BCM via CAN communication.	R

## ACTIVE TEST

### Test item

Test item	Operation	Description	S
REAR DEFOGGER	Off	OFF	T
	On	Operates the rear window defogger relay.	U
FRONT WIPER	Off	OFF	V
	Lo	Operates the front wiper relay.	W
	Hi	Operates the front wiper relay and front wiper high relay.	X

## DIAGNOSIS SYSTEM (IPDM E/R)

### < SYSTEM DESCRIPTION >

Test item	Operation	Description
MOTOR FAN	1	OFF
	2	Operates the cooling fan relay (LO operation).
	3	Operates the cooling fan relay (MID operation).
	4	Operates the cooling fan relay (HI operation).
EXTERNAL LAMPS	Off	OFF
	TAIL	Operates the tail lamp relay and the daytime running light relay. <b>NOTE:</b> Daytime running light relay is with daytime running light system only.
	Lo	Operates the headlamp low relay.
	Hi	Operates the headlamp low relay and ON/OFF the headlamp high relay at 4 seconds intervals.
	Fog	Operates the front fog lamp relay. <b>NOTE:</b> This item can test only the vehicle with front fog lamp system.
HORN	On	Operates horn relay for 20 ms.

# FRONT WIPER MOTOR LO CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

## DTC/CIRCUIT DIAGNOSIS

### FRONT WIPER MOTOR LO CIRCUIT

#### Component Function Check

INFOID:000000008277776

#### 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-21, "Diagnosis Procedure"](#).

#### Diagnosis Procedure

INFOID:000000008277777

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

##### CONSULT ACTIVE TEST

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

(+)		(-)	Condition		Voltage (Approx.)
Front wiper motor					
Connector	Terminal				
E20	3	Ground	FRONT WIPER	Lo	Battery voltage
				Off	0 V

Is the inspection result normal?

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

#### 2. CHECK FRONT WIPER MOTOR (LO) CIRCUIT

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

IPDM E/R		Front wiper motor		Continuity
Connector	Terminal	Connector	Terminal	
E14	43	E20	3	Existed

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

IPDM E/R		Ground	Continuity
Connector	Terminal		
E14	43		Not existed

Is the inspection result normal?

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

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# FRONT WIPER MOTOR HI CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

## FRONT WIPER MOTOR HI CIRCUIT

### Component Function Check

INFOID:000000008277778

#### 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-22, "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:000000008277779

#### 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			
E20	2	Ground	FRONT WIPER	Hi Battery voltage
			Off	0 V

##### Is the inspection result normal?

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

#### 2. CHECK FRONT WIPER MOTOR (HI) CIRCUIT

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

IPDM E/R		Front wiper motor		Continuity
Connector	Terminal	Connector	Terminal	
E14	42	E20	2	Existed

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

IPDM E/R		Ground	Continuity
Connector	Terminal		
E14	42		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:000000008277780

#### 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-23. "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:000000008277781

#### 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	Ground	Battery voltage
E20	4		

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	24	E20	4	Existed

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

IPDM E/R		Ground	Continuity
Connector	Terminal		
E13	24		Not existed

Is the inspection result normal?

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

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# FRONT WIPER MOTOR GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

## FRONT WIPER MOTOR GROUND CIRCUIT

### Diagnosis Procedure

INFOID:000000008277782

#### 1. CHECK FRONT WIPER MOTOR (GND) OPEN 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		Existed
E20	1		Existed

#### Is the inspection result normal?

- YES >> Front wiper motor ground circuit is normal.  
NO >> Repair or replace harness.



# WASHER SWITCH

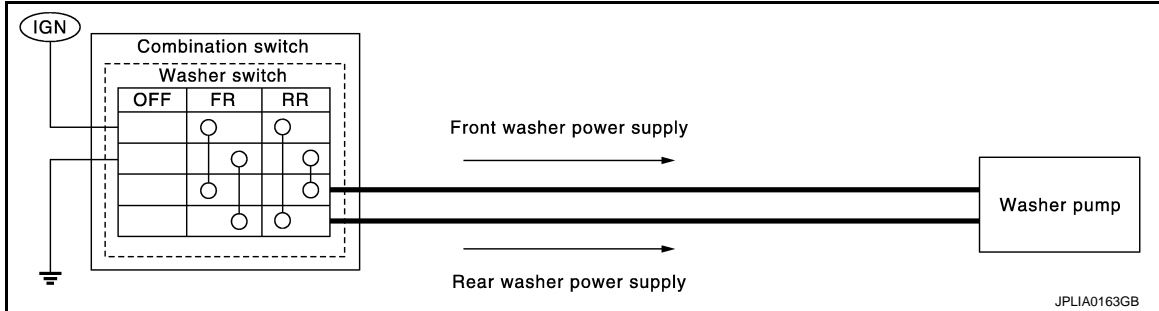
< DTC/CIRCUIT DIAGNOSIS >

## WASHER SWITCH

### Description

INFOID:000000008277783

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



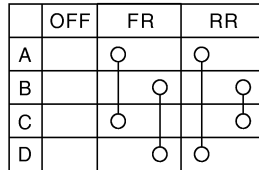
### Component Inspection

INFOID:000000008277784

#### 1. CHECK WIPER SWITCH

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

- A : Terminal 14  
 B : Terminal 12  
 C : Terminal 13  
 D : Terminal 11



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Combination switch		Condition	Continuity
Terminal			
11	12	Front washer switch ON	Existed
13	14		
11	14	Rear washer switch ON	
12	13		

Is the inspection result normal?

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

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# REAR WIPER MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

## REAR WIPER MOTOR CIRCUIT

### Component Function Check

INFOID:000000008277785

#### 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-26, "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:000000008277786

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

##### CONSULT ACTIVE TEST

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

(+)		(-)	Condition		Voltage (Approx.)
Rear wiper motor					
Connector	Terminal	Ground	REAR WIPER	On	Battery voltage
D193	1				

##### 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	
M66	55	D193	1	Existed

4. Check continuity between BCM harness connector and ground.

BCM		Ground	Continuity
Connector	Terminal		
M66	55		Not existed

##### Is the inspection result normal?

- YES >> Replace BCM. Refer to [BCS-65, "Removal and Installation"](#).  
NO >> Repair or replace harness.

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

Check continuity between rear wiper motor harness connector and ground.

# REAR WIPER MOTOR CIRCUIT

## < DTC/CIRCUIT DIAGNOSIS >

Rear wiper motor		Ground	Continuity
Connector	Terminal		
D193	3		Existed

Is the inspection result normal?

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

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# REAR WIPER STOP POSITION SIGNAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

## REAR WIPER STOP POSITION SIGNAL CIRCUIT

### Component Function Check

INFOID:000000008277787

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

### Diagnosis Procedure

INFOID:000000008277788

#### 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.)
Connector	Terminal		
D193	2	Ground	Battery voltage

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	
M66	44	D193	2	Existed

4. Check continuity between BCM harness connector and ground.

BCM		Ground	Continuity
Connector	Terminal		
M66	44		Not existed

Is the inspection result normal?

- YES >> Replace BCM. Refer to [BCS-65, "Removal and Installation"](#).  
NO >> Repair or replace harness.

# FRONT WIPER AND WASHER SYSTEM

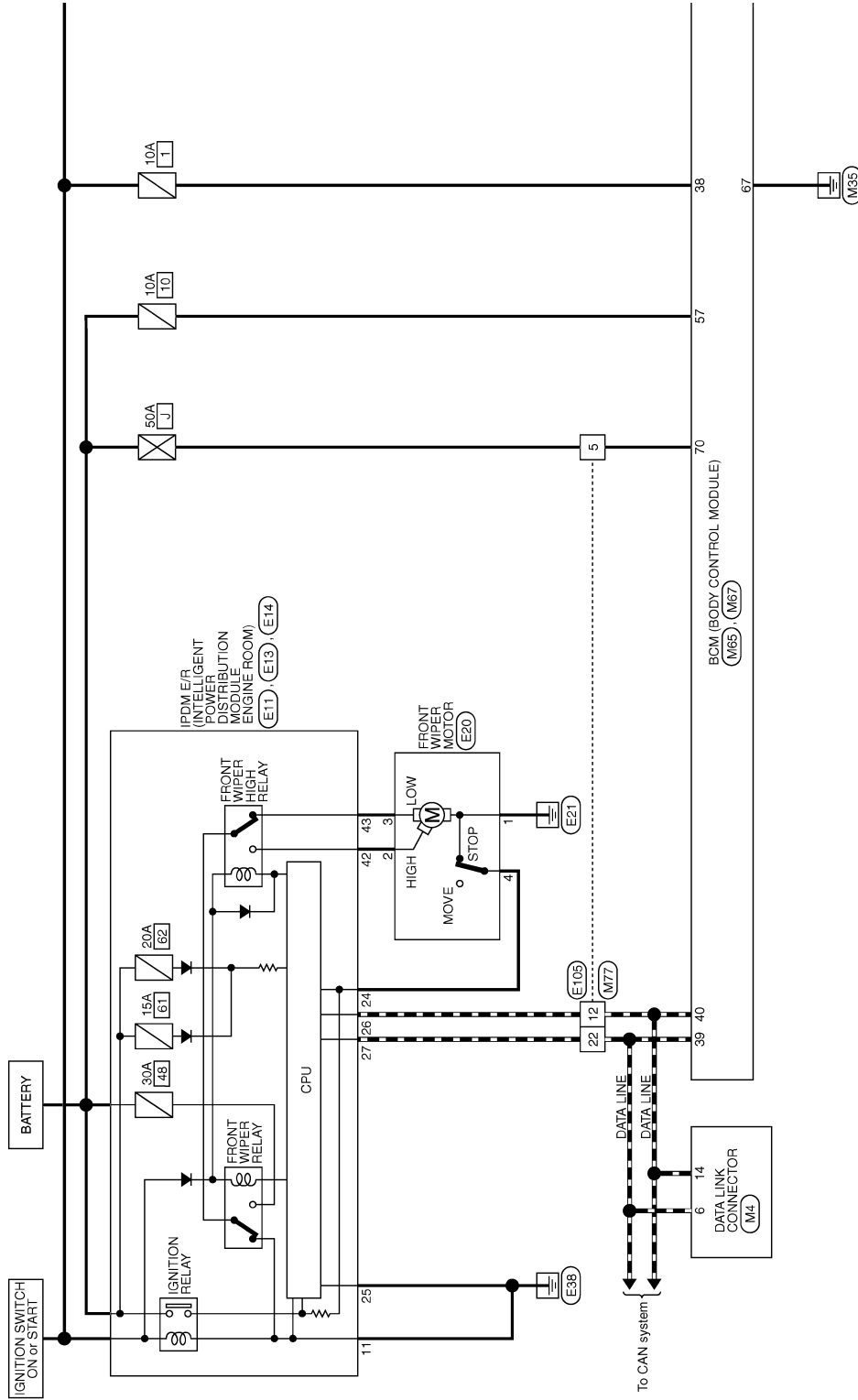
< DTC/CIRCUIT DIAGNOSIS >

## FRONT WIPER AND WASHER SYSTEM

### Wiring Diagram - FRONT WIPER AND WASHER SYSTEM -

INFOID:000000008277789

#### FRONT WIPER AND WASHER SYSTEM



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# REAR WIPER AND WASHER SYSTEM

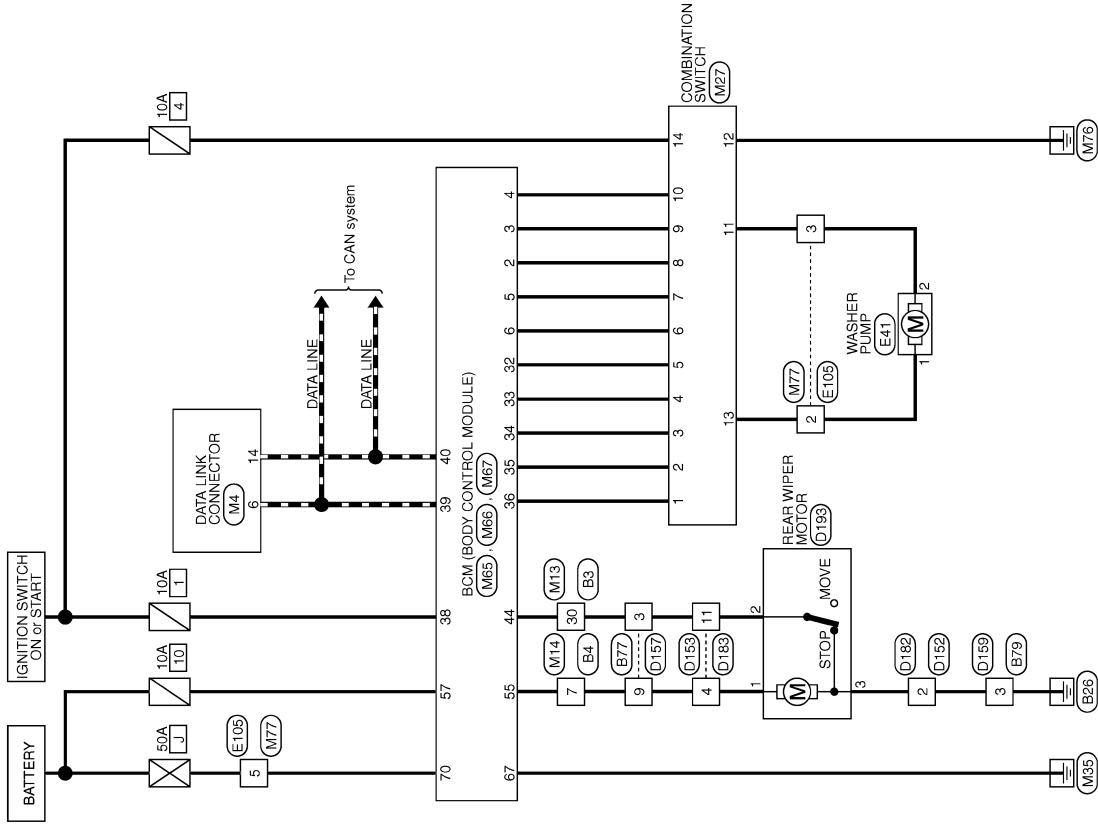
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## REAR WIPER AND WASHER SYSTEM

Wiring Diagram - REAR WIPER AND WASHER SYSTEM -

INFOID:000000008277790

REAR WIPER AND WASHER SYSTEM



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# BCM, IPDM E/R

< ECU DIAGNOSIS INFORMATION >

## ECU DIAGNOSIS INFORMATION

BCM, IPDM E/R

List of ECU Reference

INFOID:000000008277791

ECU	Reference
BCM	<a href="#">BCS-42, "Reference Value"</a>
	<a href="#">BCS-60, "Fail-safe"</a>
	<a href="#">BCS-61, "DTC Inspection Priority Chart"</a>
	<a href="#">BCS-61, "DTC Index"</a>
IPDM E/R	<a href="#">PCS-16, "Reference Value"</a>
	<a href="#">PCS-23, "Fail-safe"</a>
	<a href="#">PCS-25, "DTC Index"</a>



# WIPER AND WASHER SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

## SYMPTOM DIAGNOSIS

### WIPER AND WASHER SYSTEM SYMPTOMS

#### Symptom Table

INFOID:000000008277792

**CAUTION:**

Perform the self-diagnosis with **CONSULT** before performing the diagnosis by symptom. Perform the diagnosis by DTC if DTC is detected.

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>	Combination switch Refer to <a href="#">BCS-64, "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-22, "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 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-64, "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-21, "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"
	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-64, "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"
	HI, LO and INT	SYMPTOM DIAGNOSIS "FRONT WIPER DOES NOT OPERATE" Refer to <a href="#">WW-37, "Diagnosis Procedure"</a> .	

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## WIPER AND WASHER SYSTEM SYMPTOMS

### < SYMPTOM DIAGNOSIS >

Symptom	Probable malfunction location	Inspection item	
Front wiper does not stop.	HI only	<ul style="list-style-type: none"> <li>• Combination switch</li> <li>• BCM</li> </ul>	Combination switch Refer to <a href="#">BCS-64, "Symptom Table"</a> .
		<ul style="list-style-type: none"> <li>Front wiper request signal</li> <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>	Combination switch Refer to <a href="#">BCS-64, "Symptom Table"</a> .
		<ul style="list-style-type: none"> <li>Front wiper request signal</li> <li>• BCM</li> <li>• IPDM E/R</li> </ul>	IPDM E/R DATA MONITOR "FR WIP REQ"
		IPDM E/R	—
	INT only	<ul style="list-style-type: none"> <li>• Combination switch</li> <li>• BCM</li> </ul>	Combination switch Refer to <a href="#">BCS-64, "Symptom Table"</a> .
		<ul style="list-style-type: none"> <li>Front wiper request signal</li> <li>• BCM</li> <li>• IPDM E/R</li> </ul>	IPDM E/R DATA MONITOR "FR WIP REQ"
	Front wiper does not operate normally.	Intermittent 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>
BCM			—
Intermittent control linked with vehicle speed cannot be performed.		Check the vehicle speed detection wiper setting. Refer to <a href="#">WW-15, "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-64, "Symptom Table"</a> .
		BCM	—
Does not return to stop position. [Repeatedly operates for 10 seconds and then stops for 20 seconds. After that, it stops the operation. (Fail-safe)]	<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-23, "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-64, "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-64, "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-64, "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-26, "Component Function Check"</a> .

## WIPER AND WASHER SYSTEM SYMPTOMS

### < SYMPTOM DIAGNOSIS >

Symptom		Probable malfunction location	Inspection item
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-64, "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-64, "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-64, "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-28, "Component Function Check"</a> .

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## NORMAL OPERATING CONDITION

< SYMPTOM DIAGNOSIS >

---

### NORMAL OPERATING CONDITION

#### Description

INFOID:000000008277793

#### 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:000000008277794

The front wiper does not operate under any operation conditions.

### Diagnosis Procedure

INFOID:000000008277795

#### 1. CHECK WIPER RELAY OPERATION

##### CONSULT ACTIVE TEST

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

**Lo** : Front wiper LO operation

**Hi** : Front wiper HI operation

**Off** : Stop the front wiper.

Is front wiper operation normally?

YES >> GO TO 5.

NO >> GO TO 2.

#### 2. CHECK FRONT WIPER MOTOR FUSE

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

Unit	Location	No.	Capacity
Front wiper motor	IPDM E/R	48	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-24, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace harness.

#### 4. CHECK FRONT WIPER MOTOR INPUT VOLTAGE

##### CONSULT ACTIVE TEST

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

(+)		(-)	Condition	Voltage (Approx.)	
Front wiper motor					
Connector	Terminal				
E20	3	Ground	FRONT WIPER	Lo	Battery voltage
				Off	0 V
	2			Hi	Battery voltage
				Off	0 V

Is the inspection result normal?

YES >> Replace front wiper motor.

NO >> Replace IPDM E/R.

# FRONT WIPER DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

## 5. CHECK FRONT WIPER REQUEST SIGNAL INPUT

### CONSULT DATA MONITOR

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

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

Is the inspection result normal?

YES >> Replace IPDM E/R.

NO >> GO TO 6.

## 6. CHECK COMBINATION SWITCH

Perform the inspection of the combination switch. Refer to [BCS-64. "Symptom Table"](#).

Is combination switch normal?

YES >> Replace BCM. Refer to [BCS-65. "Removal and Installation"](#).

NO >> Repair or replace the applicable parts.

# PRECAUTIONS

< PRECAUTION >

## PRECAUTION

### PRECAUTIONS FOR USA AND CANADA

#### FOR USA AND CANADA : Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:000000008277796

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

#### **WARNING:**

Always observe the following items for preventing accidental activation.

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

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

#### **WARNING:**

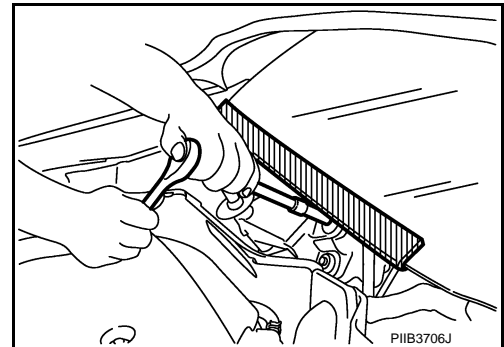
Always observe the following items for preventing accidental activation.

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

#### FOR USA AND CANADA : Precaution for Procedure without Cowl Top Cover

INFOID:000000008277797

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



#### FOR USA AND CANADA : Precautions For Xenon Headlamp Service

INFOID:000000008277798

#### **WARNING:**

Comply with the following warnings to prevent any serious accident.

- Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.
- Never work with wet hands.

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# PRECAUTIONS

## < PRECAUTION >

- Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector. (Turning it ON outside the lamp case may cause fire or visual impairments.)
- Never touch the bulb glass immediately after turning it OFF. It is extremely hot.

### **CAUTION:**

Comply with the following cautions to prevent any error and malfunction.

- Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)
- Never perform HID circuit inspection with a tester.
- Never touch the xenon bulb glass with hands. Never put oil and grease on it.
- Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.
- Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).

## FOR MEXICO

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

INFOID:000000008277799

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:**

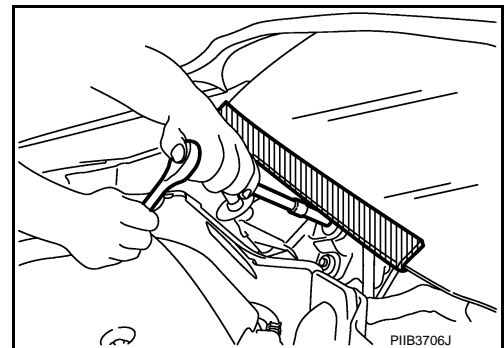
Always observe the following items for preventing accidental activation.

- 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.

## FOR MEXICO : Precaution for Procedure without Cowl Top Cover

INFOID:000000008277800

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



## FOR MEXICO : Precautions For Xenon Headlamp Service

INFOID:000000008277801

### **WARNING:**



## PRECAUTIONS

### < PRECAUTION >

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Comply with the following warnings to prevent any serious accident.

- Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts. A
- Never work with wet hands. B
- Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector. (Turning it ON outside the lamp case may cause fire or visual impairments.) C
- Never touch the bulb glass immediately after turning it OFF. It is extremely hot.

### **CAUTION:**

Comply with the following cautions to prevent any error and malfunction.

- Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.) D
- Never perform HID circuit inspection with a tester. E
- Never touch the xenon bulb glass with hands. Never put oil and grease on it. F
- Dispose of the used xenon bulb after packing it in thick vinyl without breaking it. G
- Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.). H

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# WASHER TANK

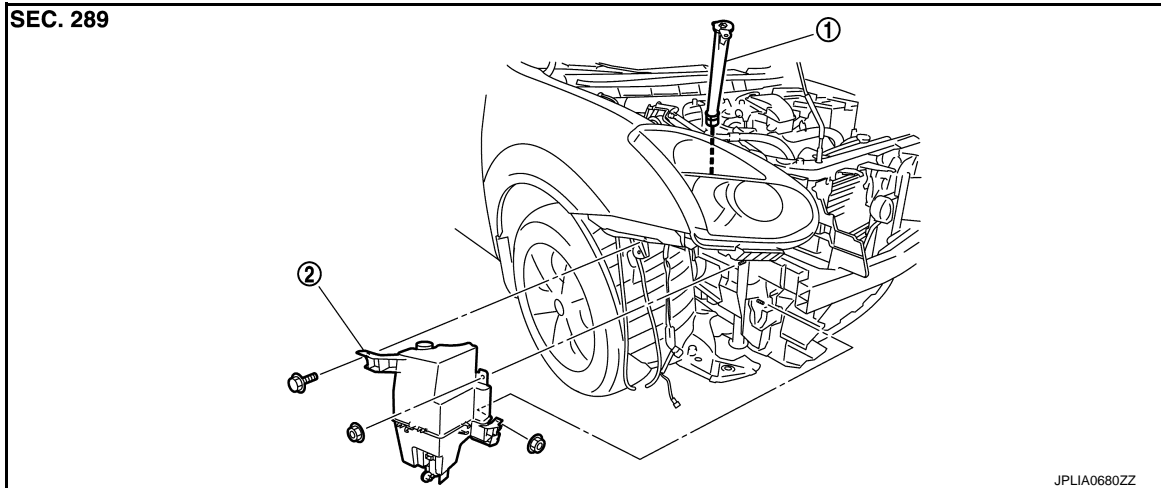
< REMOVAL AND INSTALLATION >

## REMOVAL AND INSTALLATION

### WASHER TANK

#### Exploded View

INFOID:000000008277802



1. Washer tank inlet

2. Washer tank

### Removal and Installation

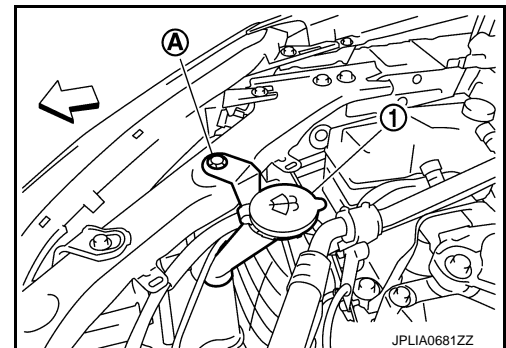
INFOID:000000008277803

#### REMOVAL

1. Remove the clip (A).

← : Vehicle front

2. Pull out the washer tank inlet (1) from the washer tank.
3. Remove the fender protector RH. Refer to [EXT-22, "Exploded View"](#).
4. Disconnect washer pump connector.
5. Disconnect washer level switch connector. (for Canada models)
6. Remove front washer tube and rear washer tube.
7. Remove washer tank mounting nuts and bolt.
8. Remove the washer tank from the vehicle.



#### INSTALLATION

Install in the reverse order of removal.

#### **CAUTION:**

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

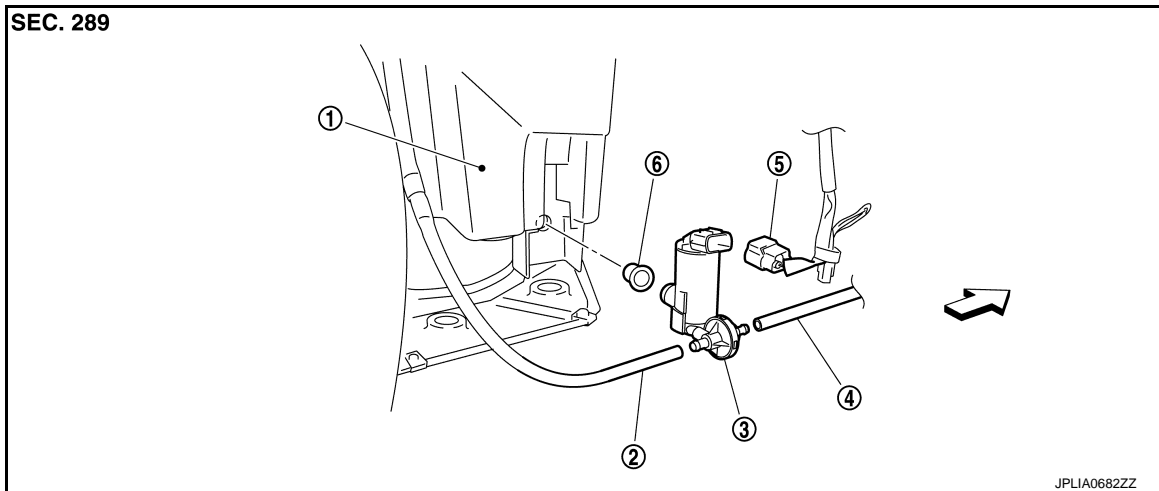
# WASHER PUMP

< REMOVAL AND INSTALLATION >

## WASHER PUMP

### Exploded View

INFOID:000000008277804



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

↔ : Vehicle front

### Removal and Installation

INFOID:000000008277805

#### REMOVAL

1. Remove the fender protector RH (front). Refer to [EXT-22, "Exploded View"](#).
2. Disconnect washer pump connector.
3. Remove front washer tube and rear washer tube.
4. Remove washer pump from the washer tank.
5. Remove the packing from the washer tank.

#### INSTALLATION

Install in the reverse order of removal.

#### **CAUTION:**

**Never twist the packing when installing the washer pump.**

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## WASHER LEVEL SWITCH

< REMOVAL AND INSTALLATION >

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### WASHER LEVEL SWITCH

#### Removal and Installation

INFOID:000000008277806

The washer level switch must be replaced together with the washer tank as an assembly. Refer to [WW-42](#), "[Removal and Installation](#)".

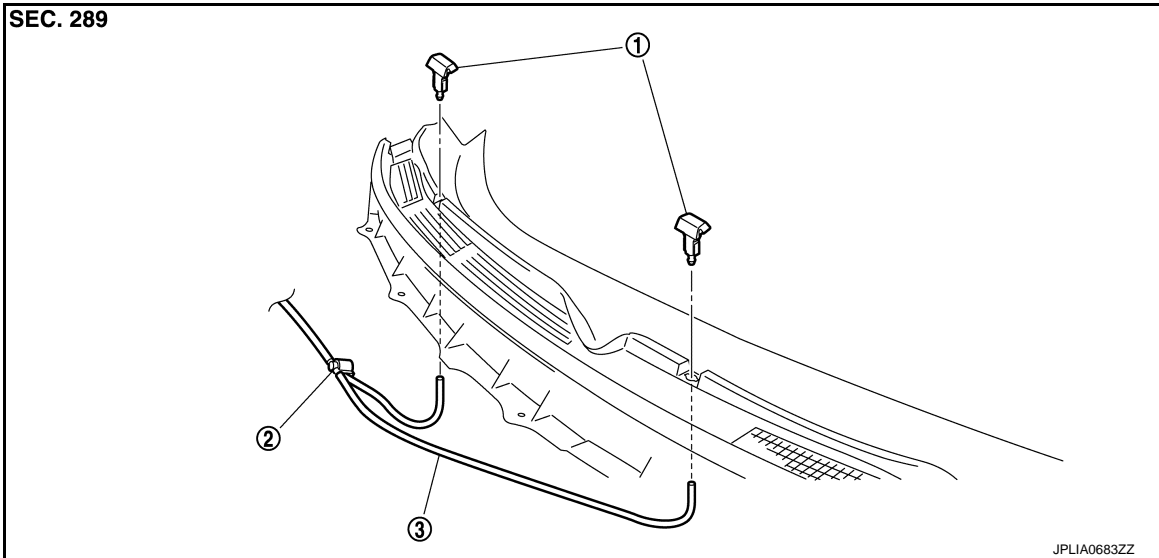
# FRONT WASHER NOZZLE AND TUBE

< REMOVAL AND INSTALLATION >

## FRONT WASHER NOZZLE AND TUBE

Exploded View

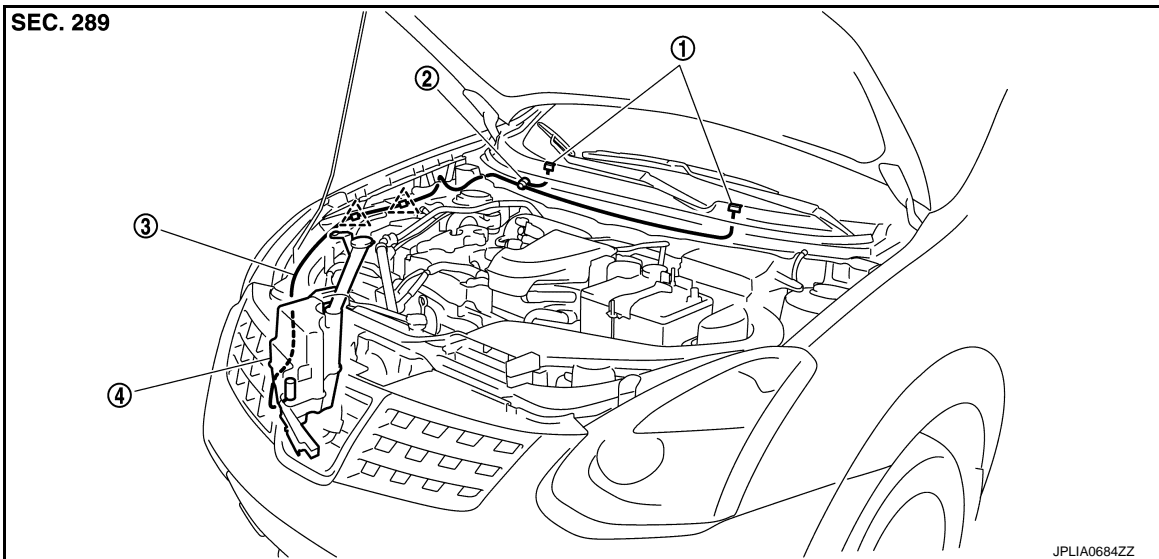
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- 1. Front washer nozzle
- 2. Check valve
- 3. Front washer tube

Hydraulic Layout

INFOID:000000008277808



- 1. Front washer nozzle
- 2. Check valve
- 3. Front washer tube
- 4. Washer tank

 : Clip

Removal and Installation

INFOID:000000008277809

### REMOVAL

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

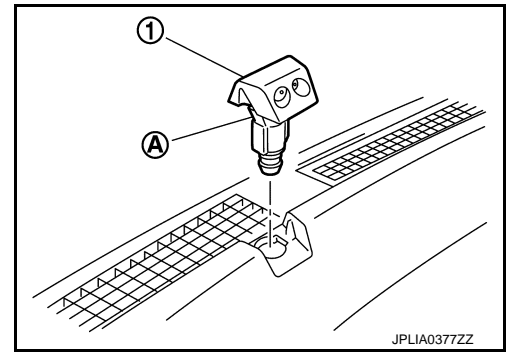
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# FRONT WASHER NOZZLE AND TUBE

## < REMOVAL AND INSTALLATION >

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



## INSTALLATION

Install in the reverse order of removal.

### CAUTION:

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

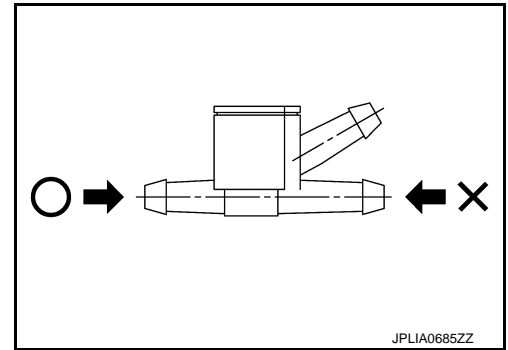
## Inspection and Adjustment

INFOID:000000008277810

## INSPECTION

Check valve Inspection

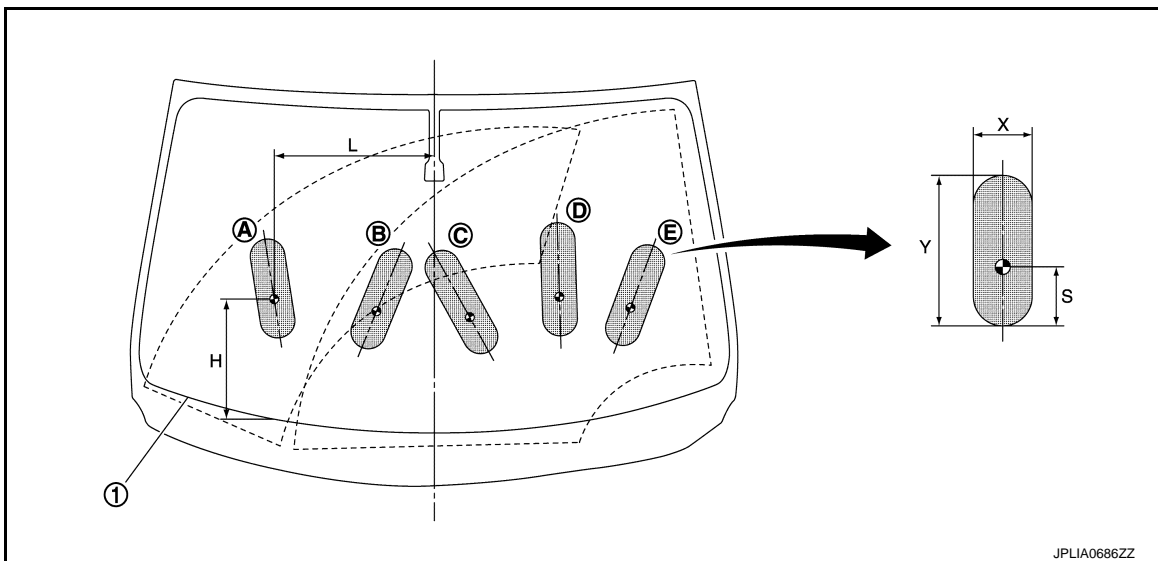
Check that air can pass through the hose by blowing forward (toward the nozzle), and check that air cannot pass through by sucking.



## ADJUSTMENT

Washer Nozzle Spray Position Adjustment

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



1. Black printed frame line

Spray area

Target spray position

# FRONT WASHER NOZZLE AND TUBE

## < REMOVAL AND INSTALLATION >

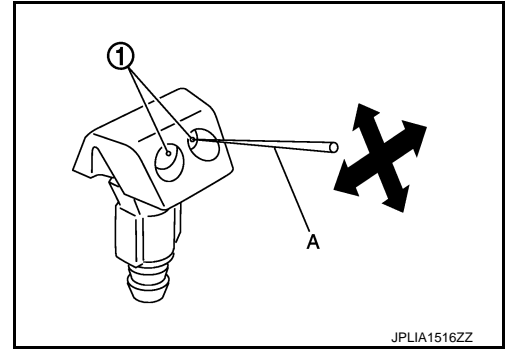
Unit: mm (in)

Spray position	H	L	X	Y	S
A	285 (11.22)	360 (14.17)	80 (3.15)	250 (9.84)	80 (3.15)
B	285 (11.22)	135 (5.31)	80 (3.15)	260 (10.24)	80 (3.15)
C	275 (10.83)	90 (3.54)	80 (3.15)	265 (10.43)	80 (3.15)
D	305 (12.01)	285 (11.22)	80 (3.15)	265 (10.43)	80 (3.15)
E	245 (9.65)	440 (17.32)	80 (3.15)	260 (10.24)	80 (3.15)

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.



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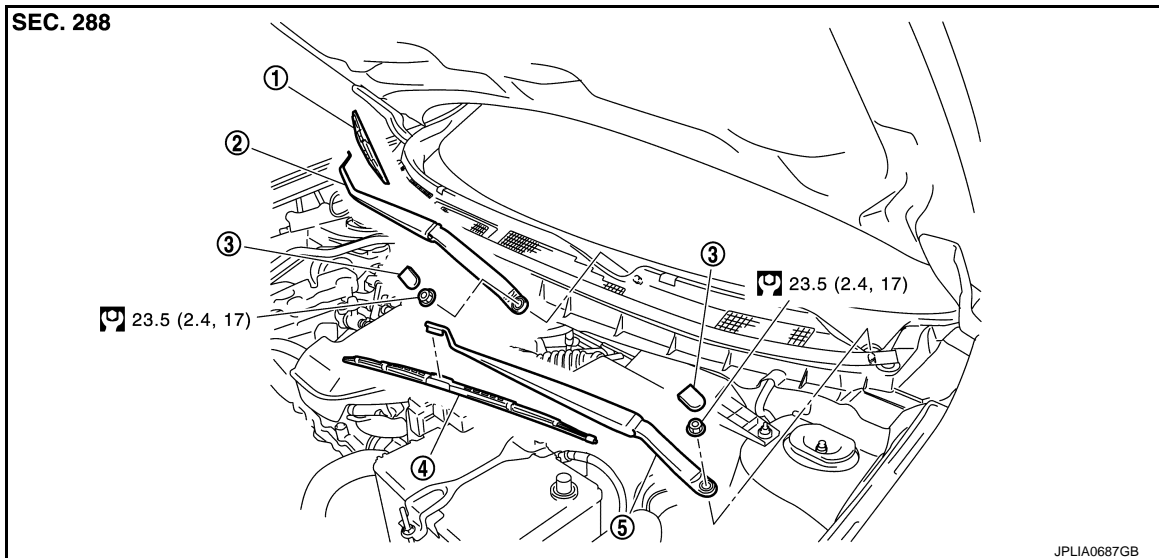
# FRONT WIPER ARM

< REMOVAL AND INSTALLATION >

## FRONT WIPER ARM

Exploded View

INFOID:000000008277811



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

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

## Removal and Installation

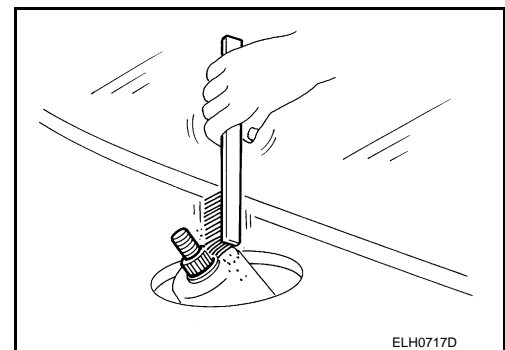
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### REMOVAL

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

### INSTALLATION

1. Clean wiper arm mount as shown in the figure to prevent nuts from being loosened.
2. Operate the front wiper motor to move the front wiper to the auto stop position.
3. Adjust the front wiper blade position. Refer to [WW-48, "Adjustment"](#).
4. Install the front wiper arms by tightening the mounting nuts.
5. Inject the washer fluid.
6. Operate the front wiper to move it to the auto stop position.
7. Check that the front wiper blades stop at the specified position.
8. Install front wiper arm caps.



## Adjustment

INFOID:000000008277813

### WIPER BLADE POSITION ADJUSTMENT

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



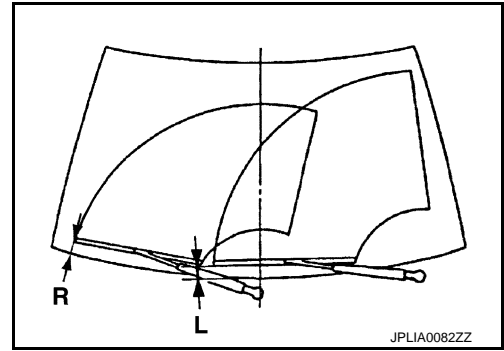
# FRONT WIPER ARM

## < REMOVAL AND INSTALLATION >

Standard clearance

**R** :  $34.5 \pm 7.5 \text{ mm}$  ( $1.358 \pm 0.295 \text{ in}$ )

**L** :  $41.3 \pm 7.5 \text{ mm}$  ( $1.626 \pm 0.295 \text{ in}$ )



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# FRONT WIPER DRIVE ASSEMBLY

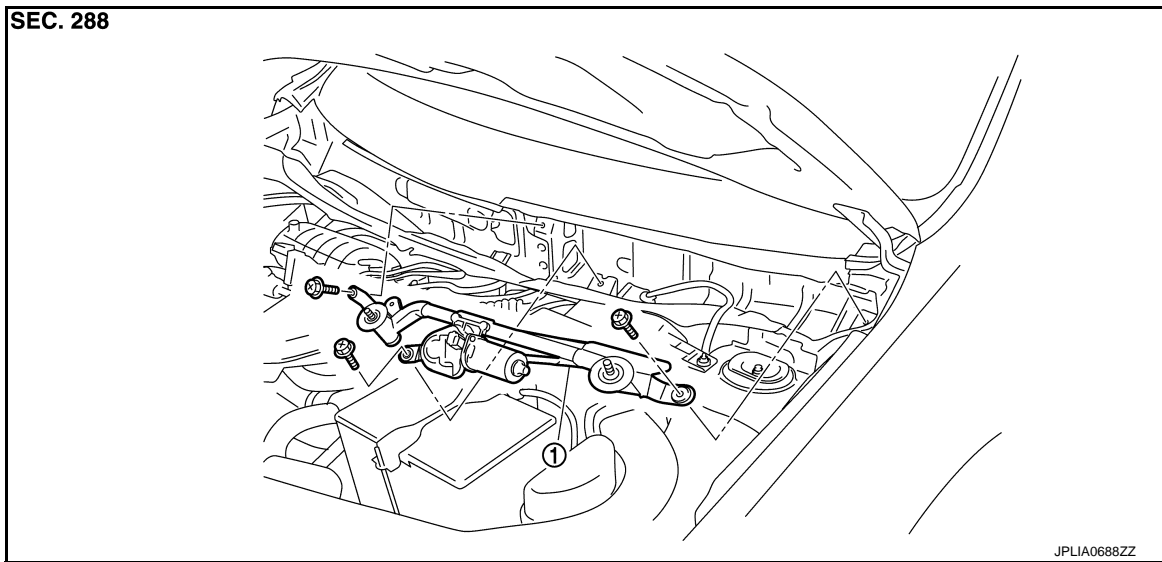
< REMOVAL AND INSTALLATION >

## FRONT WIPER DRIVE ASSEMBLY

Exploded View

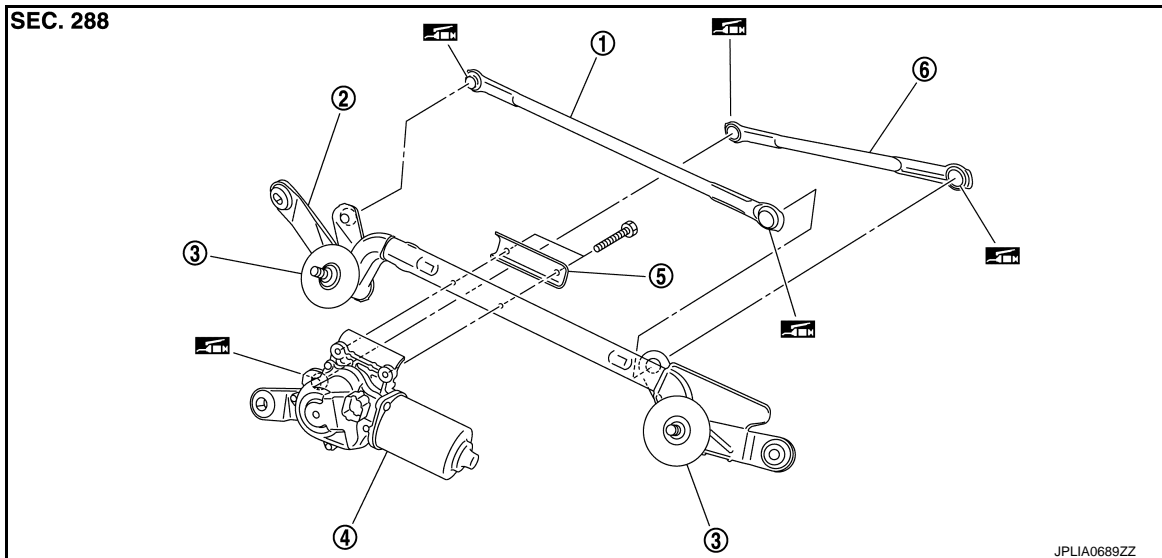
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REMOVAL VIEW




1. Front wiper drive assembly

DISASSEMBLY VIEW



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

: Multi-purpose grease or an equivalent

Removal and Installation

INFOID:000000008277815

REMOVAL

1. Remove front wiper arm. Refer to [WW-48, "Exploded View"](#).
2. Remove cowl top cover. Refer to [EXT-20, "Exploded View"](#).
3. Remove bolts from the front wiper drive assembly.

# FRONT WIPER DRIVE ASSEMBLY

## < REMOVAL AND INSTALLATION >

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

A

## INSTALLATION

1. Install the front wiper drive assembly to the vehicle.
2. Connect the front wiper motor connector.
3. Operate the front wiper to move it to the auto stop position.
4. Install the cowl top cover. Refer to [EXT-20, "Exploded View"](#).
5. Install front wiper arms. Refer to [WW-48, "Exploded View"](#).

B

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## Disassembly and Assembly

INFOID:000000008277816

D

## DISASSEMBLY

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

E

F

## ASSEMBLY

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

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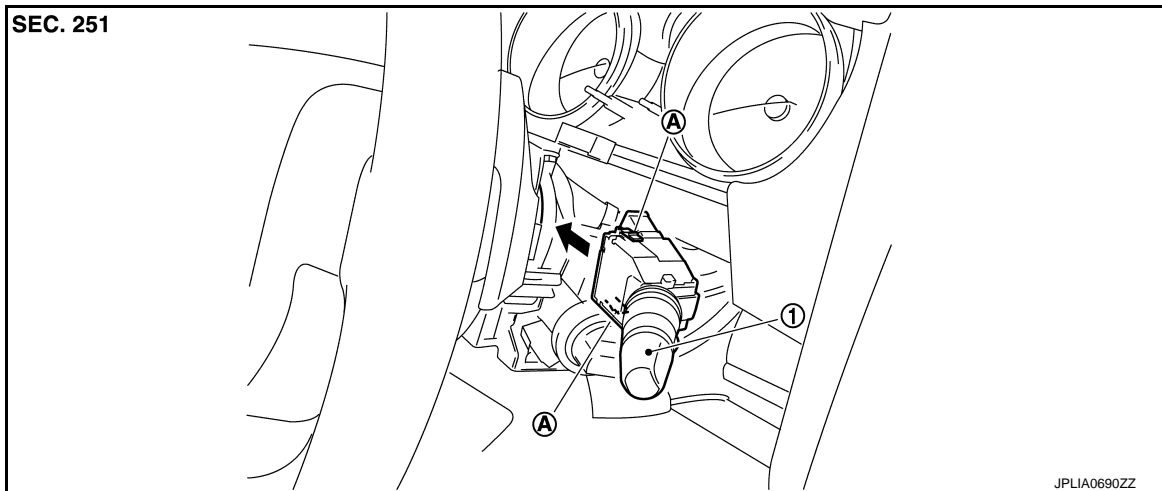
# WIPER AND WASHER SWITCH

< REMOVAL AND INSTALLATION >

## WIPER AND WASHER SWITCH

Exploded View

INFOID:000000008277817



- 1. Wiper & washer switch
- A. Pawl

## Removal and Installation

INFOID:000000008277818

### REMOVAL

1. Remove steering column cover. Refer to [IP-13. "Exploded View"](#).
2. While pressing pawls, pull the wiper & washer switch. And disconnect it from the switch base.

### INSTALLATION

Install in the reverse order of removal.

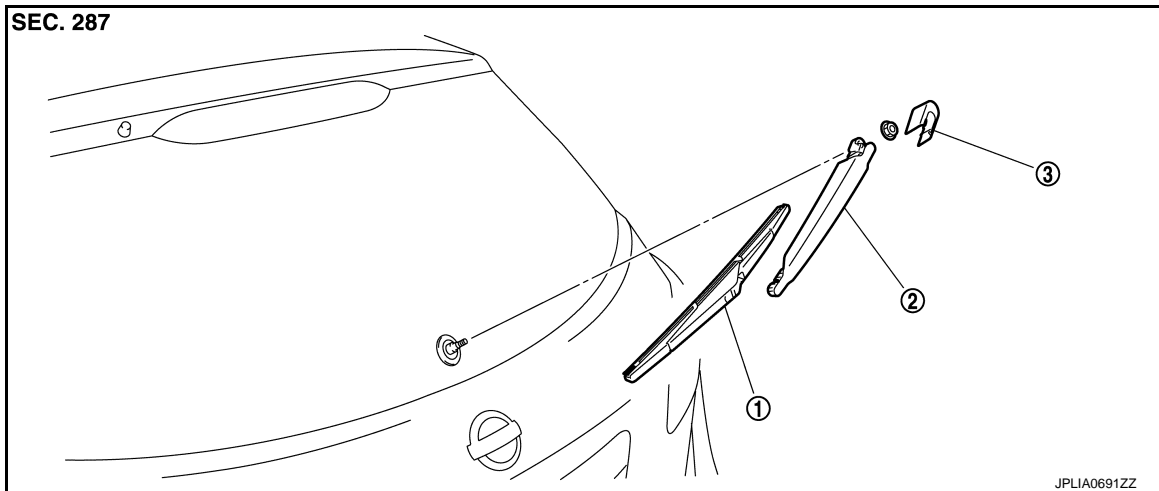
# REAR WIPER ARM

< REMOVAL AND INSTALLATION >

## REAR WIPER ARM

### Exploded View

INFOID:000000008277819



1. Rear wiper blade

2. Rear wiper arm

3. Rear wiper arm cover

### Removal and Installation

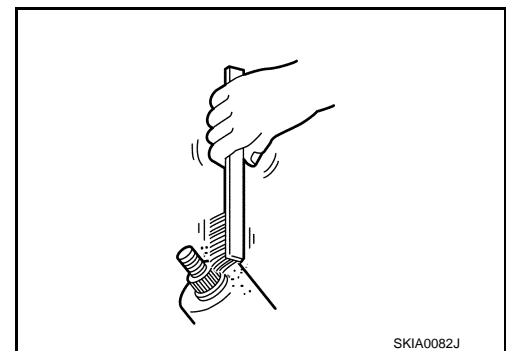
INFOID:000000008277820

#### REMOVAL

1. Operate the rear wiper to the auto stop position.
2. Remove the rear wiper arm cover.
3. Remove the rear wiper arm mounting nut.
4. Raise rear wiper arm, and 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-53, "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:000000008277821

#### REAR WIPER BLADE POSITION ADJUSTMENT

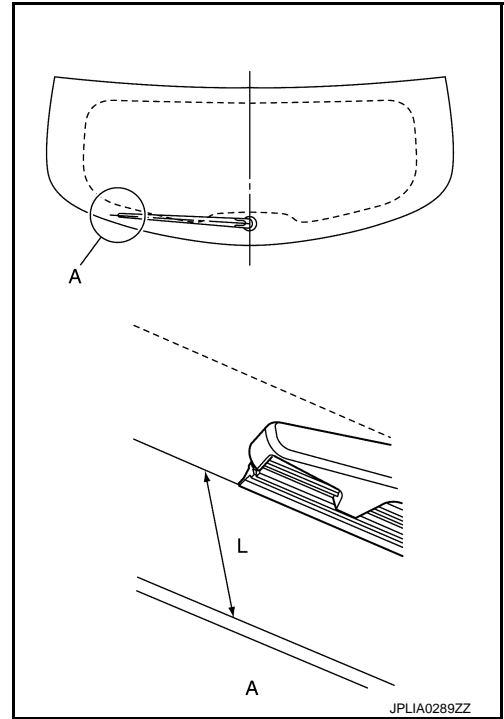
Clearance between the end of back door glass and the top of wiper blade center.

# REAR WIPER ARM

## < REMOVAL AND INSTALLATION >

Standard clearance

**L : 28.0 ± 7.5 mm (1.102 ± 0.295 in)**



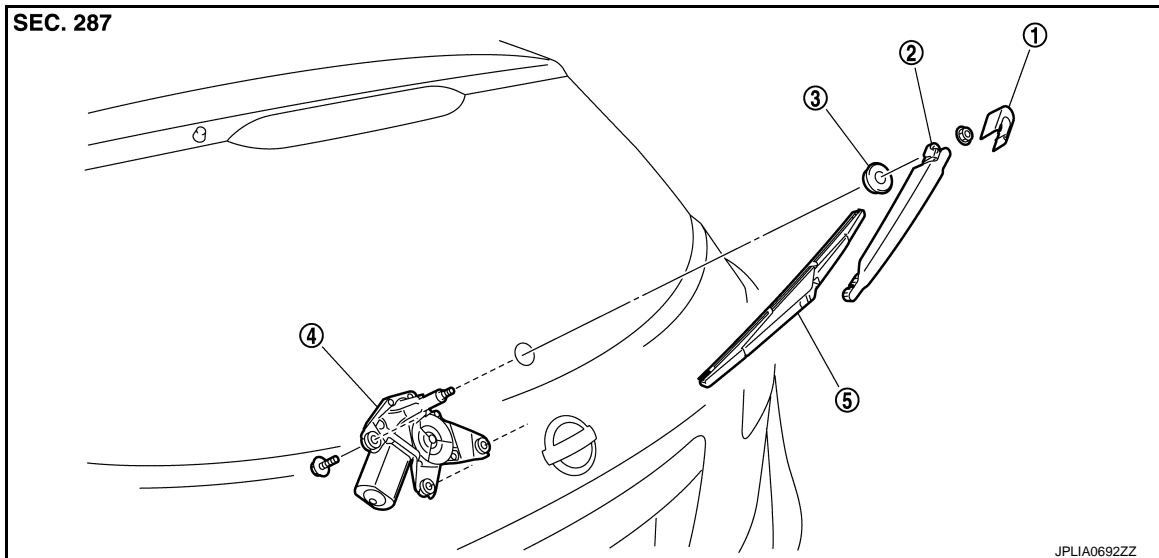
# REAR WIPER MOTOR

< REMOVAL AND INSTALLATION >

## REAR WIPER MOTOR

### Exploded View

INFOID:000000008277822



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

### Removal and Installation

INFOID:000000008277823

#### REMOVAL

1. Remove rear wiper arm cover and rear wiper arm. Refer to [WW-53, "Exploded View"](#).
2. Remove back door trim finisher lower. Refer to [INT-34, "Exploded View"](#).
3. Disconnect the rear wiper motor connector.
4. Remove rear wiper motor mounting bolts.
5. Remove rear wiper motor from the vehicle.
6. Remove pivot seal.

#### INSTALLATION

1. Install the pivot seal.
2. Install the rear wiper motor to the vehicle.
3. Connect the rear wiper motor connector.
4. Operate the rear wiper to the auto stop position.
5. Install the back door trim finisher lower. Refer to [INT-34, "Exploded View"](#).
6. Install rear wiper arm cover and rear wiper arm. Refer to [WW-53, "Exploded View"](#).

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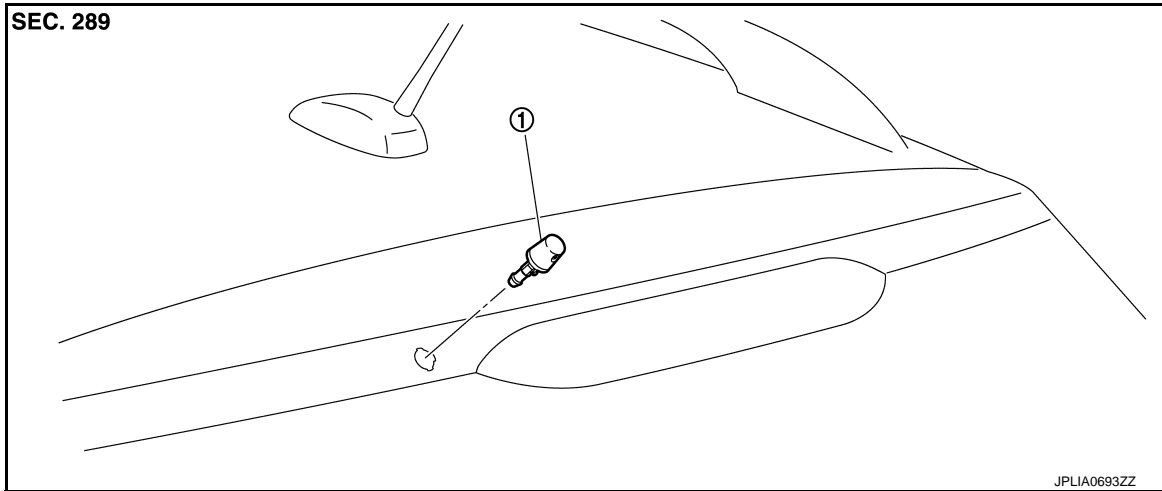
# REAR WASHER NOZZLE AND TUBE

< REMOVAL AND INSTALLATION >

## REAR WASHER NOZZLE AND TUBE

Exploded View

INFOID:000000008277824



1. Rear washer nozzle

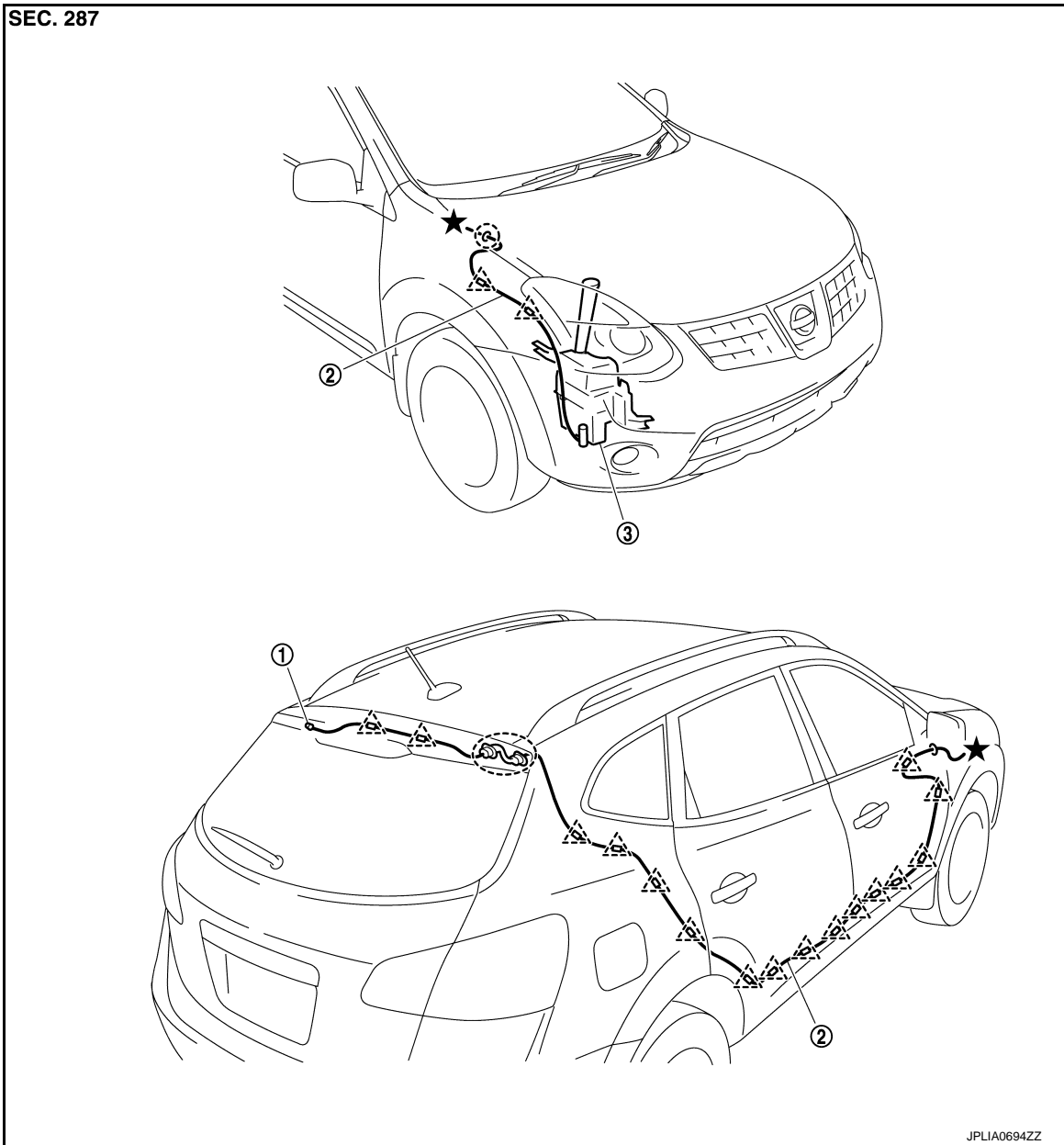


# REAR WASHER NOZZLE AND TUBE

< REMOVAL AND INSTALLATION >

## Hydraulic Layout

INFOID:000000008277825



## Removal and Installation

INFOID:000000008277826

### REMOVAL

1. Remove the back door inner finisher. Refer to [INT-34, "Exploded View"](#).
2. Remove the rear washer tube from the rear washer nozzle.

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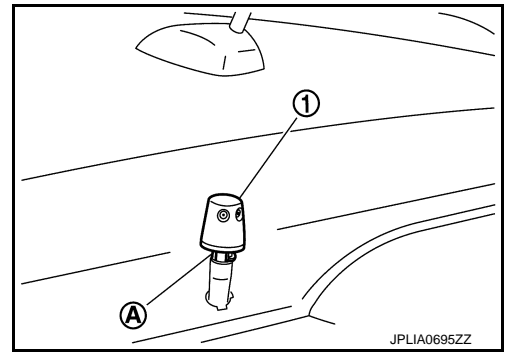
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# REAR WASHER NOZZLE AND TUBE

## < REMOVAL AND INSTALLATION >

3. Push pawl (A), and remove the rear washer nozzle (1) from the back door.



## INSTALLATION

Install in the reverse order of removal.

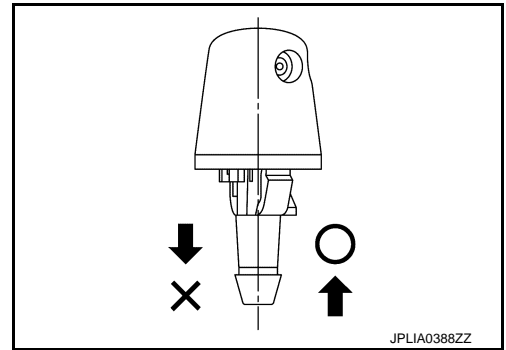
## Inspection and Adjustment

INFOID:000000008277827

## 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

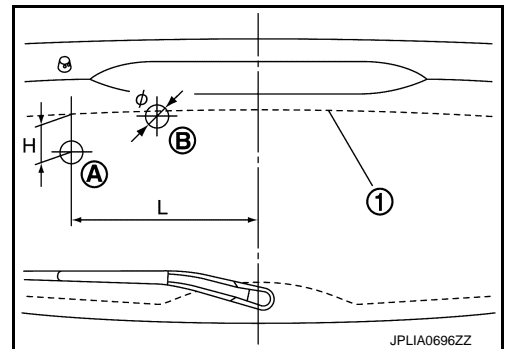
### Washer Nozzle Spray Position adjustment

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

1 : Black printed frame line

Unit: mm (in)

Spray position	H : Height	L : Length	$\phi$ : Spray position area
A	48.9 (1.93)	240.7 (9.48)	30 (1.18)
B	6.8 (0.27)	130.8 (5.15)	30 (1.18)



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

