SECTION WW
WIPER & WASHER

CONTENTS

PRECAUTION

PRECAUTIONS

Precaution for Technicians Using Medical Electric

INFOID:0000000007631573

OPERATION PROHIBITION

WARNING:

- **Parts with strong magnet is used in this vehicle.**
- **Technicians using a medical electric device such as pacemaker must never perform operation on the vehicle, as magnetic field can affect the device function by approaching to such parts.**

NORMAL CHARGE PRECAUTION

WARNING:

- **If a technician uses a medical electric device such as an implantable cardiac pacemaker or an implantable cardioverter defibrillator, the possible effects on the devices must be checked with the device manufacturer before starting the charge operation.**
- **As radiated electromagnetic wave generated by on board charger at normal charge operation may effect medical electric devices, a technician using a medical electric device such as implantable cardiac pacemaker or an implantable cardioverter defibrillator must not enter the vehicle compartment (including luggage room) during normal charge operation.**

PRECAUTION AT TELEMATICS SYSTEM OPERATION

WARNING:

- **If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna.**
- **The electromagnetic wave of TCU might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), when using the service, etc.**
- **If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), the electromagnetic wave of TCU might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before TCU use.**

PRECAUTION AT INTELLIGENT KEY SYSTEM OPERATION

WARNING:

- **If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna.**
- **The electromagnetic wave of Intelligent Key might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), at door operation, at each request switch operation, or at engine starting.**
- **If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), the electromagnetic wave of Intelligent Key might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before Intelligent Key use.**

Point to Be Checked Before Starting Maintenance Work

INFOID:0000000007631574

The high voltage system may starts automatically. It is required to check that the timer air conditioner and timer charge (during EVSE connection) are not set before starting maintenance work.
NOTE:
If the timer air conditioner or timer charge (during EVSE connection) is set, the high voltage system starts automatically even when the power switch is in OFF state.

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

INFOID:0000000007631575

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:

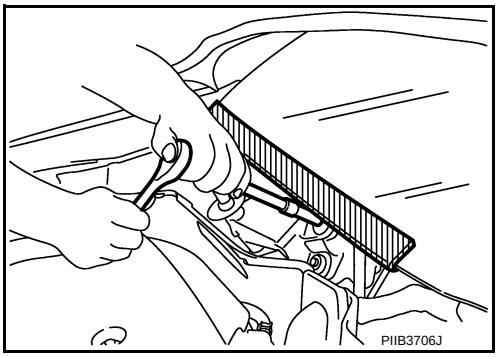
Always observe the following items for preventing accidental activation.

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the power switch ON, 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 power switch OFF, disconnect the 12V battery, and wait at least 3 minutes before performing any service.**

Precaution for Procedure without Cowl Top Cover

INFOID:0000000007815172

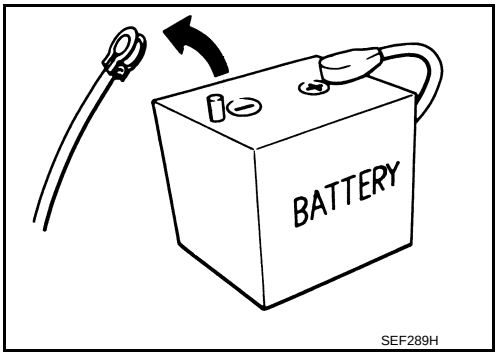
When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



Precautions for Removing Battery Terminal

INFOID:0000000007631576

- When removing the 12V battery terminal, turn OFF the power switch and wait at least 5 minutes.
  NOTE:
  ECU may be active for several minutes after the power switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.
- Always disconnect the battery terminal within 60 minutes after turning OFF the power switch. Even when the power switch is OFF, the 12V battery automatic charge control may automatically start after a lapse of 60 minutes from power switch OFF.
- Disconnect 12V battery terminal according to the following steps.



WORK PROCEDURE

1. Check that EVSE is not connected.
   NOTE:
   If EVSE is connected, the air conditioning system may be automatically activated by the timer A/C function.
2. Turn the power switch OFF → ON → OFF. Get out of the vehicle. Close all doors (including back door).

3. Check that the charge status indicator lamp does not blink and wait for 5 minutes or more.
   NOTE:
   If the battery is removed within 5 minutes after the power switch is turned OFF, plural DTCs may be detected.
4. Remove 12V battery terminal within 60 minutes after turning the power switch OFF → ON → OFF.
   CAUTION:
   - **After all doors (including back door) are closed, if a door (including back door) is opened before battery terminals are disconnected, start over from Step 1.**
   - **After turning the power switch OFF, if "Remote A/C" is activated by user operation, stop the air conditioner and start over from Step 1.**

   NOTE:
   Once the power switch is turned ON → OFF, the 12V battery automatic charge control does not start for approximately 1 hour.

- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the power switch.
  NOTE:
  If the power switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.
- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
  NOTE:
  The removal of 12V battery may cause a DTC detection error.

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

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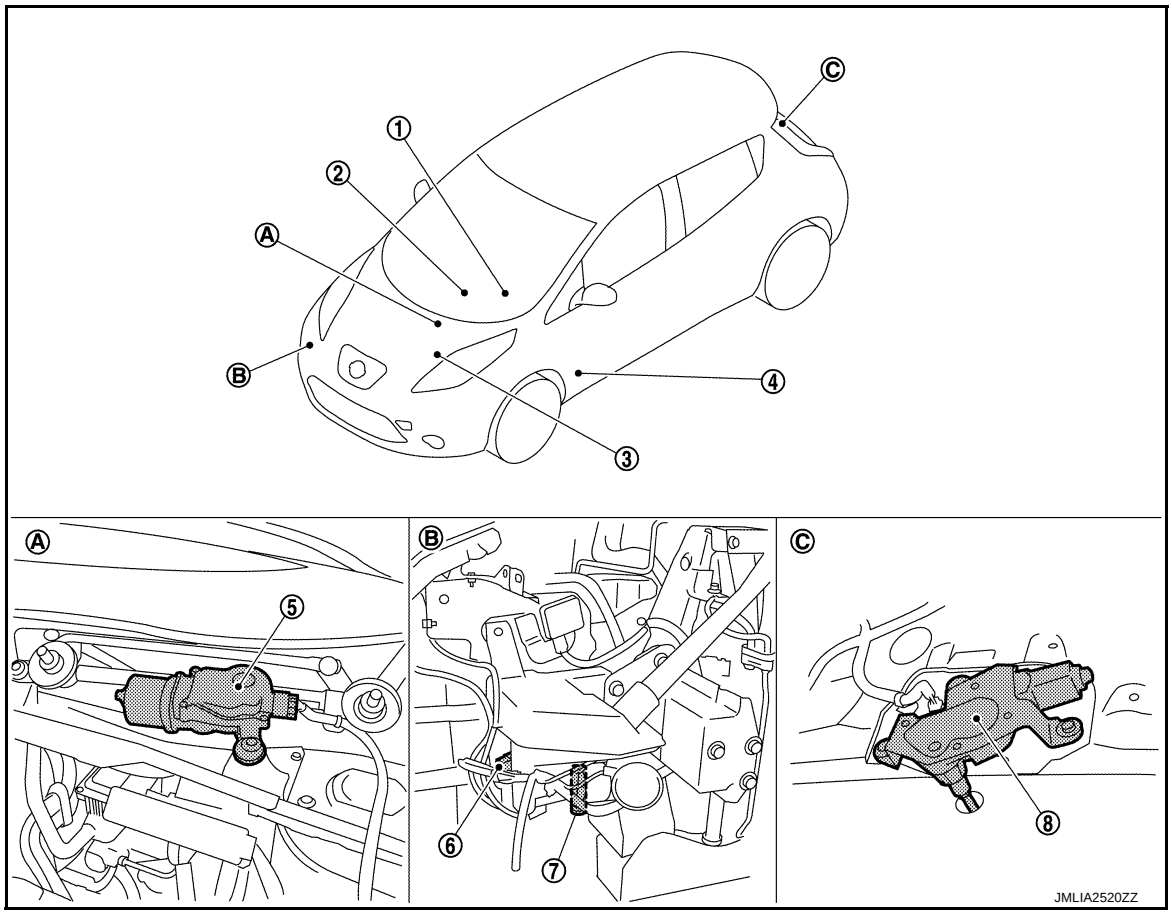


A. Cowl top, left side of motor room B. Behind front fender protector (RH) C. Back door lower finisher inside

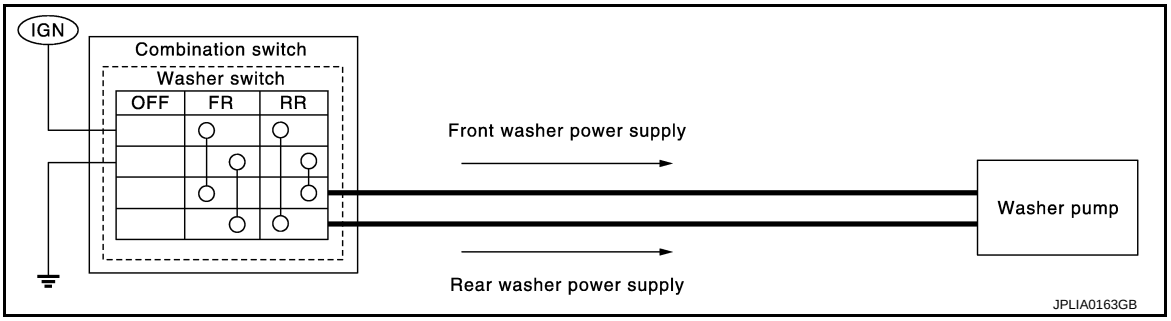
No.	Component	Function
1.	Combination switch (Wiper & washer switch)	Refer to BCS-9, "COMBINATION SWITCH READING SYSTEM : System Description". Refer to WW-7, "Washer Switch".
2.	Combination meter	Transmits the vehicle speed signal to BCM via CAN communication.
3.	IPDM E/R	• Controls the integrated relay according to the request (via CAN communication) from BCM. • Performs the auto stop control of the front wiper. Refer to PCS-7, "Component Parts Location".
4.	BCM	• Judges each switch status by the combination switch reading function. • Requests (via CAN communication) the front wiper relay and the front wiper HI/LO relay ON to IPDM E/R. • Supplies power to the wiper motor. • Performs the auto stop control of the rear wiper. Refer to BCS-6, "BODY CONTROL SYSTEM : Component Parts Location".
5.	Front wiper motor	Refer to WW-7, "Front wiper motor".
6.	Washer pump	Refer to WW-7, "Washer pump".
7.	Washer level switch*	Refer to WW-7, "Washer level switch".
8.	Rear wiper motor	Refer to WW-8, "Rear wiper motor".

*: For Canada

Washer Switch

INFOID:0000000007631578

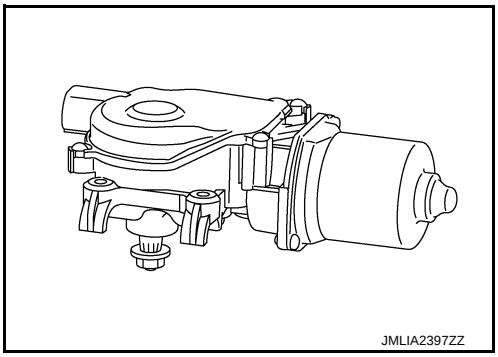
- Washer switch is integrated with combination switch.
- Combination switch operates front washer or rear washer by changing voltage polarity to be supplied to washer pump.



Front wiper motor

INFOID:0000000007631579

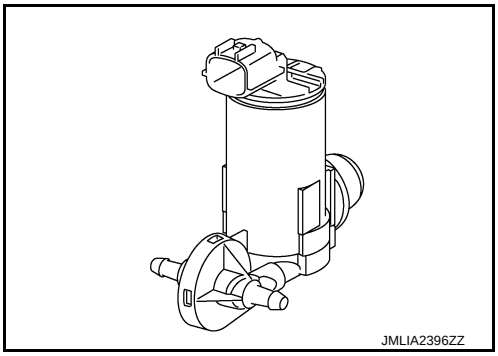
- Controls front wiper operation with IPDM E/R control.
- Transmits front wiper stop position signal to IPDM E/R.



Washer pump

INFOID:0000000007631580

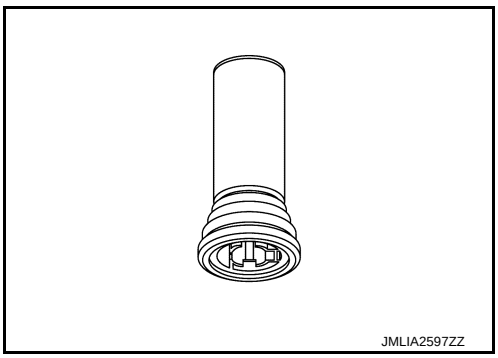
- Washer fluid is sprayed according to washer switch states.
- Switching between front washer and rear washer is performed according to the voltage polarity change to washer pump.



Washer level switch

INFOID:0000000007815037

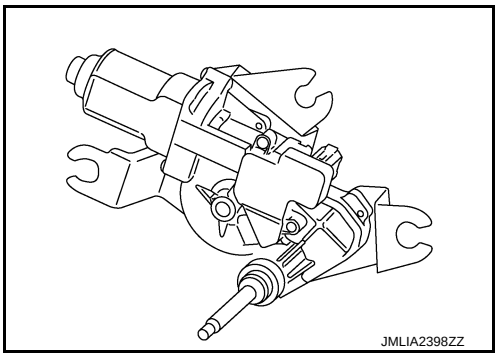
Detects that washer fluid level is low and transmits washer level signal to combination meter.



Rear wiper motor

INFOID:0000000007631581

- Controls rear wiper operation with BCM control.
- Transmits rear wiper stop position signal to BCM.



SYSTEM

FRONT WIPER AND WASHER SYSTEM

FRONT WIPER AND WASHER SYSTEM : System Description

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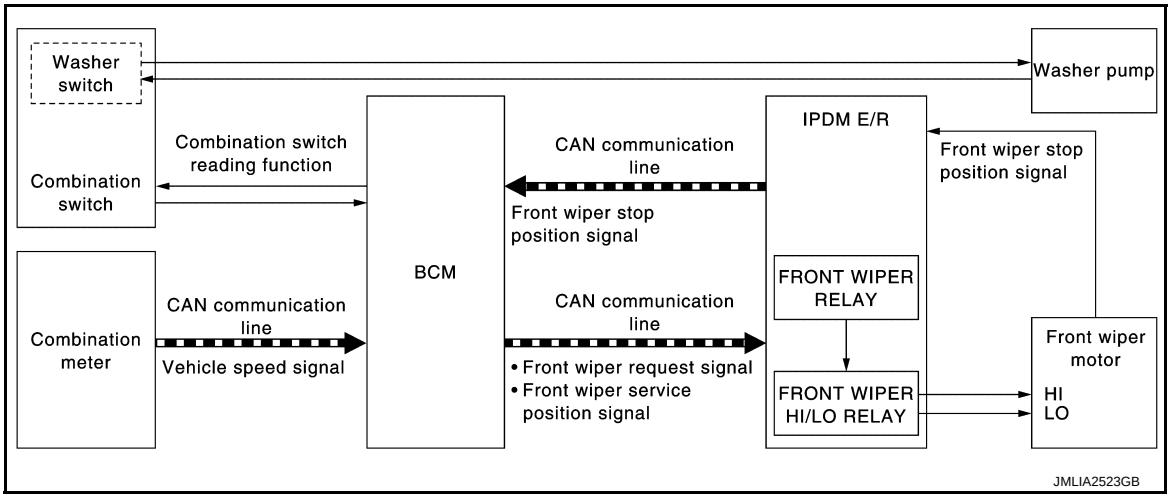
SYSTEM DIAGRAM



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-33, "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 HI/LO 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
- Power 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.

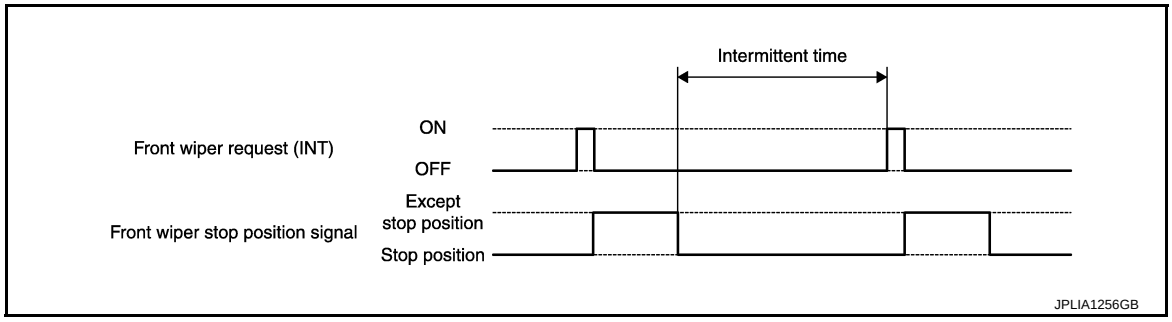
Front wiper HI operating condition
- Power switch ON
- Front wiper switch HI
- IPDM E/R turns ON the integrated front wiper relay and the front wiper high relay according to the front wiper request signal (HI).

FRONT WIPER INT OPERATION

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

Front wiper INT operating condition
- Power switch ON
- Front wiper switch INT

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



NOTE:
Factory setting of the front wiper intermittent operation is operation not linked with vehicle speed. Front wiper intermittent operation can be set to operation linked or not linked with vehicle speed using CONSULT. Refer to WW-19, "WIPER : CONSULT Function - WIPER".

Front wiper intermittent operation with vehicle speed
- BCM calculates the intermittent operation delay interval from the following
- Vehicle speed signal
- Wiper intermittent dial position

Unit: Second

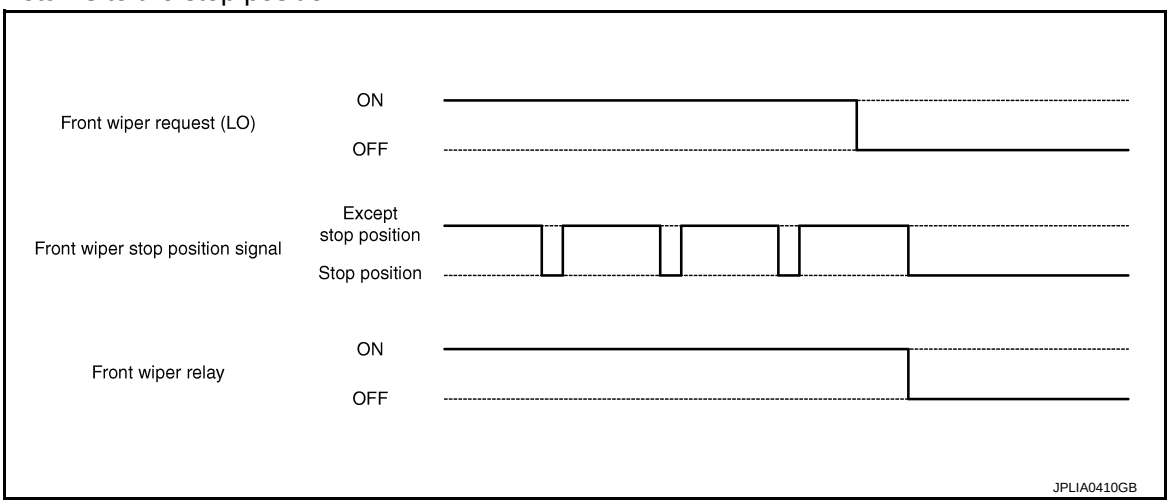
Wiper intermittent dial position	Intermittent operation interval	Intermittent operation delay Interval		
		Vehicle speed		
		0 – 5 km/h (0 – 3.1 MPH)	5 – 65 km/h (3.1 – 40.4 MPH)*	65 km/h (40.4 MPH) or more
1	Short ↑	1	0.4	0.24
2		2.5	1	0.6
3		5	2	1.2
4		7.5	3	1.8
5		12.5	5	3
6	↓ Long	25	10	6
7		40	16	9.6

*: When operation setting is not linked with vehicle speed.

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).

- 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 power switch is OFF.
- IPDM E/R turns the front wiper relay OFF when the power 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
- Turn power 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 SERVICE POSITION OPERATION

- Front wiper operates in LO, stops, and then stays in lock back position when front washer switch is turned ON while power switch is OFF.
- BCM transmits front wiper service position signal via CAN communication according to the front wiper service position function operating conditions.

Operation conditions of front wiper service position function
- Turn power switch OFF (within 1 minutes)
- Front washer switch ON (0.4 second or more)
- Front wiper operates at LO and then stops when IPDM E/R detects front wiper service position signal.
- Front wiper service position function is cancelled when front wiper washer switch is turned ON again within 1 minute after turning power switch OFF. If 1 minute or more is passed after turning power switch OFF, front wiper service position function is cancelled when power switch is turned ON again, and then front wiper switch (INT, LO, HI, MIST or WASHER) is turned ON.

NOTE:
Front wiper does not operate even if front wiper switch (INT, LO, or HI) is ON when power switch is turned ON while front wiper is stopped according to front wiper service position function.

WIPER LINKED AUTO LIGHTING FUNCTION (EXCEPT FOR CANADA)

When light switch is in the AUTO position, front wiper operates, and then headlamp illuminates. Refer to EXL-15, "AUTO LIGHT SYSTEM (EXCEPT FOR CANADA) : System Description".

FRONT WIPER AND WASHER SYSTEM : Circuit Diagram

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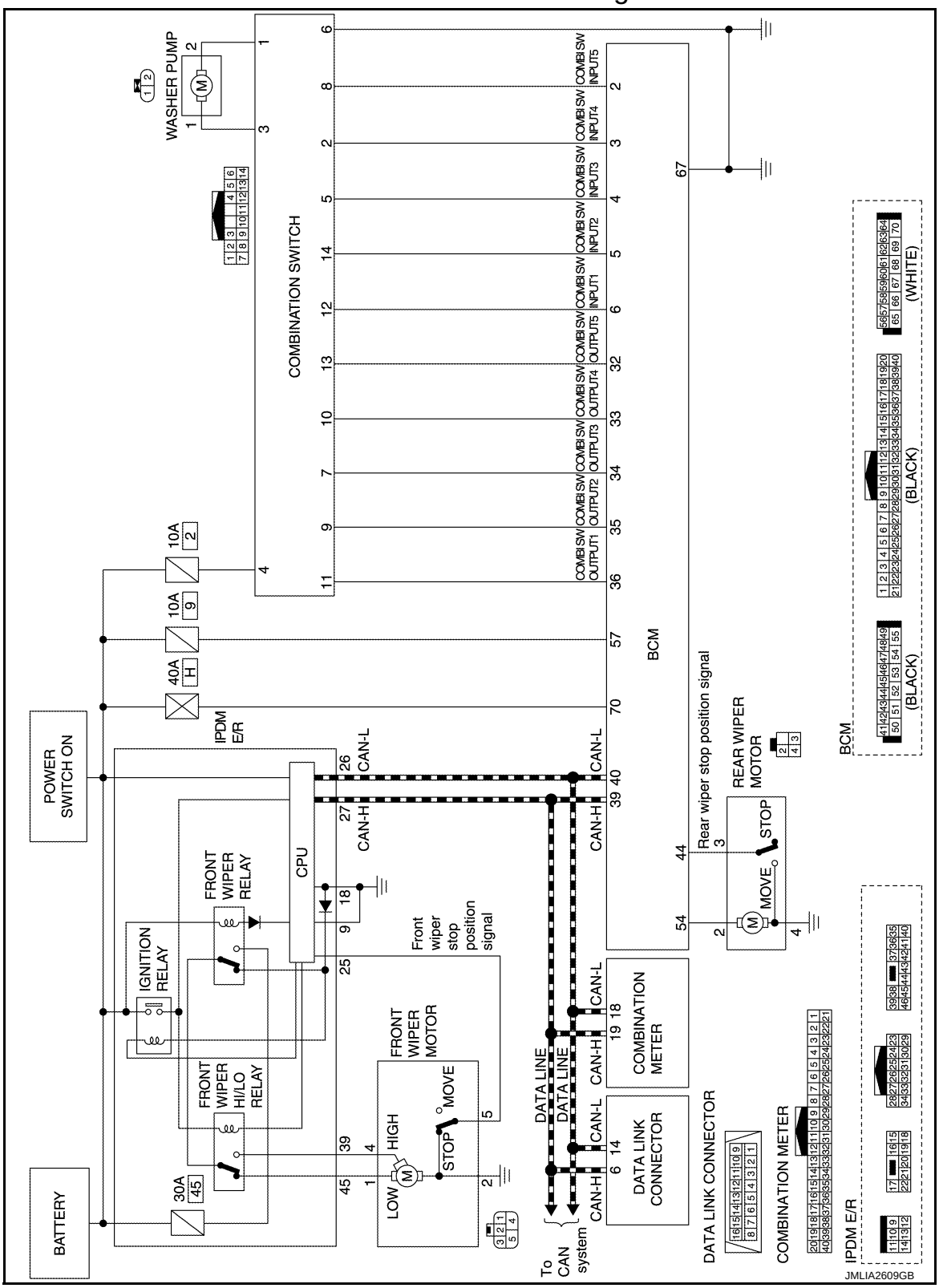


FRONT WIPER AND WASHER SYSTEM : Fail-safe

INFOID:0000000007631584

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.

Control part	Fail-safe operation
Front wiper	• The status just before activation of fail-safe control is maintained until the power switch is turned OFF while the front wiper is operating at LO or HI speed. • The wiper is operated at LO speed until the power 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.

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.

Power 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.

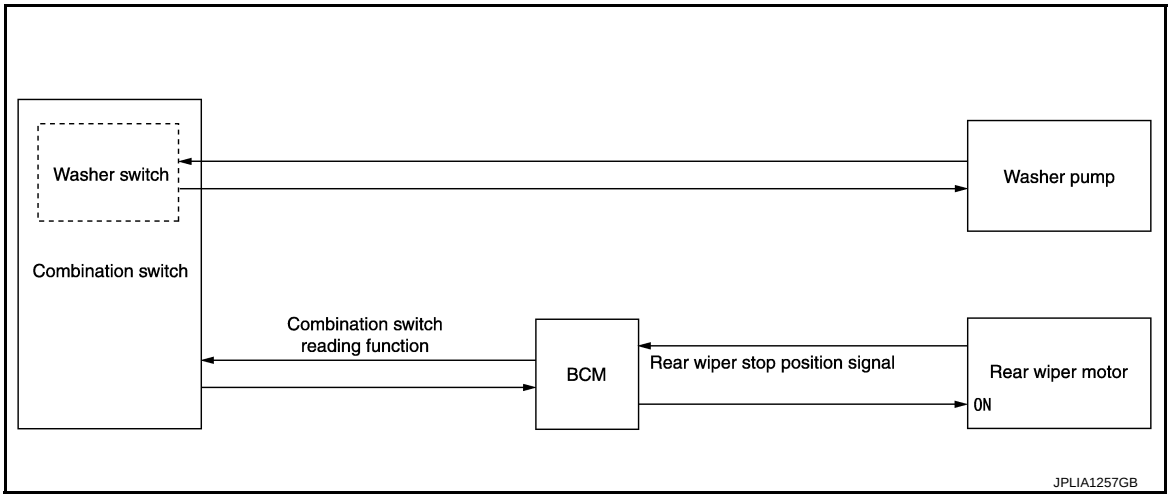
Fail-safe Control
- Front wiper control
- Front wiper switch AUTO and sensing rain drop: The condition just before the activation of fail-safe is maintained until the front wiper switch is turned OFF.
- Front wiper switch AUTO and not sensing rain drop: Front wiper is LO operation until the front wiper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

REAR WIPER AND WASHER SYSTEM

REAR WIPER AND WASHER SYSTEM : System Description

INFOID:0000000007631585

SYSTEM DIAGRAM



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.

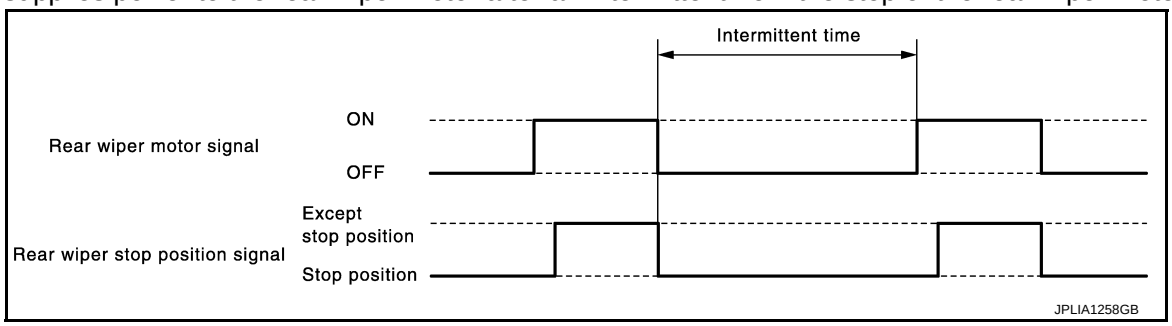
Rear wiper ON operating condition
- Power switch ON
- Rear wiper switch ON

REAR WIPER INT OPERATION

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

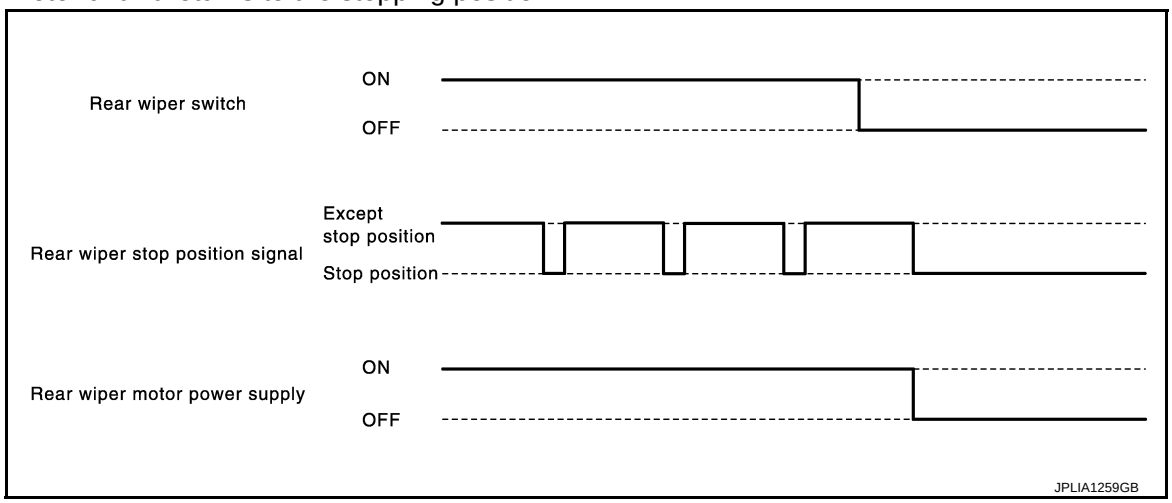
Rear wiper INT operating condition
- Power switch ON
- Rear wiper switch INT

- 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.
- 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 stopping position, BCM continues to supply power to the rear wiper motor until it returns to the stopping position.



NOTE:
BCM stops supplying power to the rear wiper motor when the power 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
- Power 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 AND WASHER SYSTEM : Circuit Diagram

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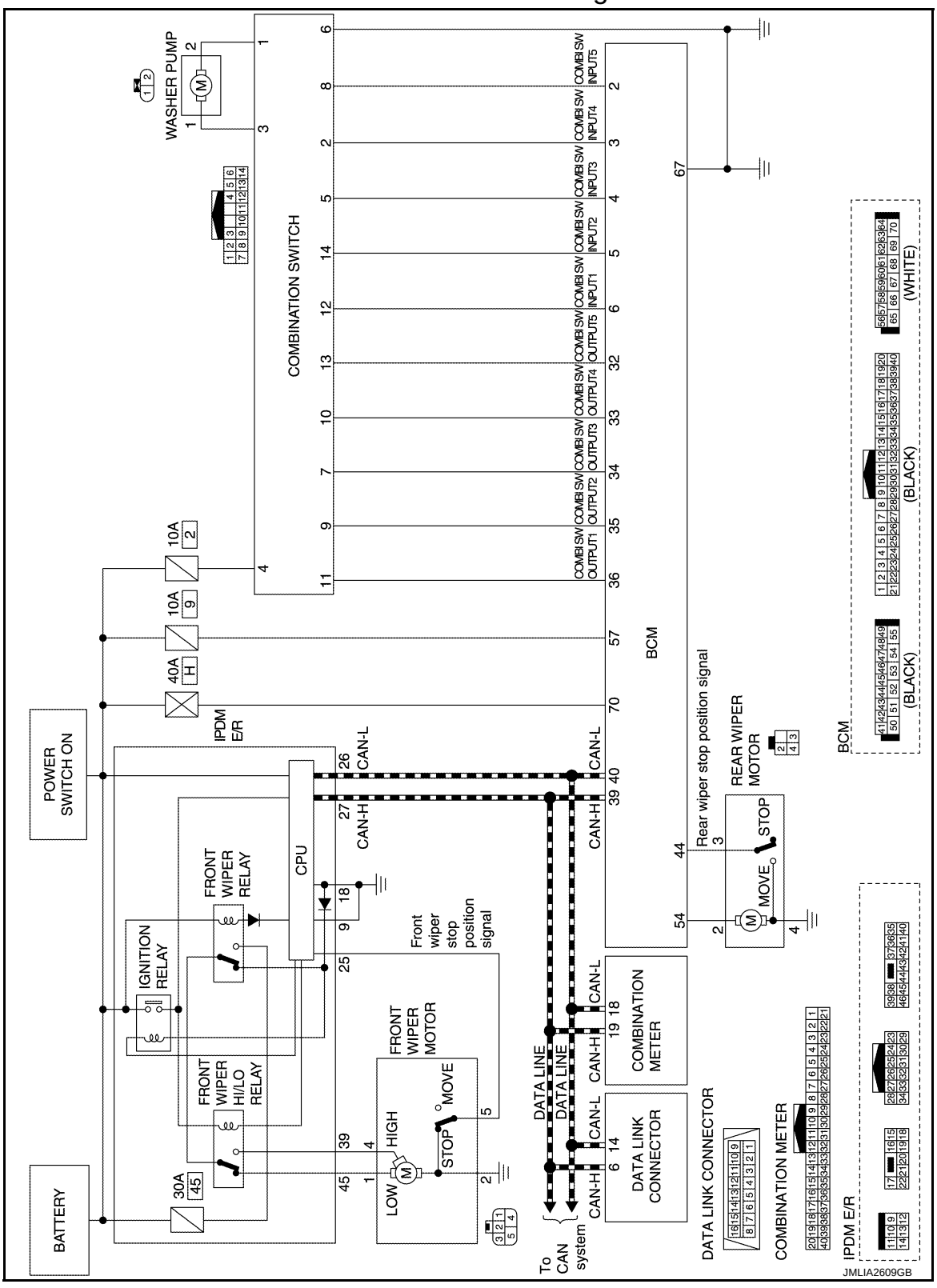


REAR WIPER AND WASHER SYSTEM : Fail-safe

INFOID:0000000007631587

REAR WIPER MOTOR PROTECTION

BCM detects the rear wiper stopping 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.

DIAGNOSIS SYSTEM (BCM)
COMMON ITEM
COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)

INFOID:0000000007815234

APPLICATION ITEM
CONSULT performs the following functions via CAN communication with BCM.

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

SYSTEM APPLICATION
BCM can perform the following functions for each system.
NOTE:
It can perform the diagnosis modes except the following for all sub system selection items.

×: Applicable item

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

*: This item is displayed, 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.

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 supply 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 OFF (LOCK)]
	SLEEP>OFF		While turning BCM status from low power consumption mode to normal mode [Power supply position is OFF (OFF)]
	LOCK>ACC		While turning power supply position from OFF (LOCK) to ACC
	ACC>ON		While turning power supply position from ACC to ON
	RUN>ACC		While turning power supply position from READY (RUN) to ACC (Except emergency stop operation)
	CRANK>RUN		While turning power supply position from READY (CRANK) to READY (RUN)
	RUN>URGENT		While turning power supply position from READY (RUN) to ACC (Emergency stop operation)
	ACC>OFF		While turning power supply position from ACC to OFF (OFF)
	OFF>LOCK		While turning power supply position from OFF (OFF) to OFF (LOCK)
	OFF>ACC		While turning power supply position from OFF (OFF) to ACC
	ON>CRANK		While turning power supply position from ON to READY (CRANK)
	OFF>SLEEP		While turning BCM status from normal mode [Power supply position is OFF (OFF)] to low power consumption mode
	LOCK>SLEEP		While turning BCM status from normal mode [Power supply position is OFF (LOCK)] to low power consumption mode
	LOCK		Power supply position is OFF (LOCK)
	OFF		Power supply position is OFF (OFF)
	ACC		Power supply position is ACC
	ON		Power supply position is ON
	ENGINE RUN		Power supply position is READY (RUN)
	CRANKING		Power supply position is READY (CRANK)
IGN Counter	0 - 39	The number of times that power switch is turned ON after DTC is detected • The number is 0 when a malfunction is detected now. • The number increases like 1 → 2 → 3...38 → 39 after returning to the normal condition whenever power switch OFF → ON. • The number is fixed to 39 until the self-diagnosis results are erased if it is over 39.	

NOTE:

*: Refer to the following for details of the power supply position.

- OFF (OFF, LOCK): Power switch OFF
- ACC: Power switch ACC
- ON: Power switch ON
- READY (CRANK): Shifting to vehicle condition READY (Transmitting the READY signal from BCM to VCM)
- READY (RUN): Vehicle condition READY

Power supply position shifts to “OFF (LOCK)” from “OFF (OFF)”, when power switch is in the OFF position, shift position is in the P position, and any of the following conditions are met.

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

The power supply position shifts to “ACC” when the power switch (push switch) is pushed at “OFF (LOCK)”.

WIPER

WIPER : CONSULT Function - WIPER

INFOID:0000000007631589

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
PUSH SW [Off/On]	The switch status input from power switch (push 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
RAIN SENSOR [OFF/LOW/HIGH/SPLASH/NG]	**NOTE:** The item is indicated, but not monitored

ACTIVE TEST

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

DIAGNOSIS SYSTEM (IPDM E/R)

Diagnosis Description

INFOID:0000000007815237

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.

- Rear window defogger
- Front wiper motor
- Parking lamp
- License plate lamp
- Tail lamp
- Front fog lamp
- Side marker lamp
- Headlamp (LO, HI)

Operation Procedure

NOTE:

Never perform auto active test in the following conditions.

- CONSULT is connected.
- Passenger door is open.

1. Turn the power switch OFF.
2. Turn the power switch ON, and within 20 seconds, press the driver door switch 10 times. Then turn the power switch OFF.
3. Turn the power switch ON within 10 seconds. After that the horn sounds once and the auto active test starts.
   NOTE:
   Never depress brake pedal while operating power switch so that auto active test is not activated.
4. After a series of the following operations is repeated 3 times, auto active test is completed.

NOTE:

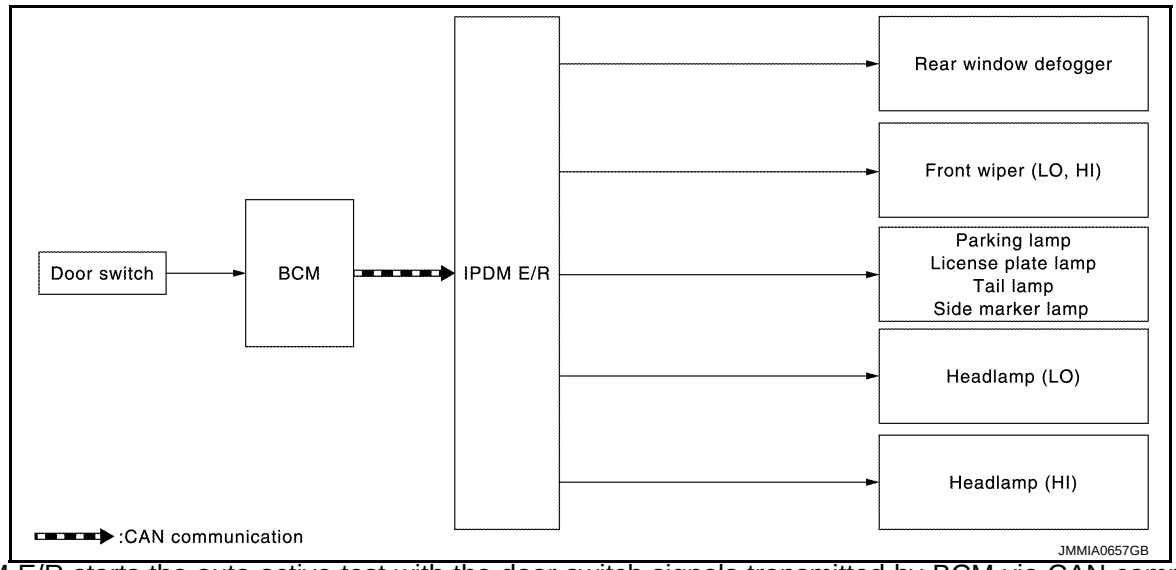
- When auto active test mode has to be cancelled halfway through test, turn the power switch OFF.
- When auto active test is not activated, door switch may be the cause. Check door switch. Refer to DLK-87, "Component Function Check".

Inspection in Auto Active Test Mode

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

Operation sequence	Inspection location	Operation
1	Rear window defogger	10 seconds
2	Front wiper motor	LO for 5 seconds → HI for 5 seconds
3	• Parking lamp • License plate lamp • Tail lamp • Front fog lamp • Side marker lamp	10 seconds
4	Headlamp	LO for 10 seconds →HI 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 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	• Rear window defogger • Rear window defogger ground circuit • Harness or connector between IPDM E/R and rear window defogger • IPDM E/R
Any of the following components do not operate • Parking lamp • License plate lamp • Tail lamp • Front fog lamp • Headlamp (HI, LO) • Side marker lamp • Front wiper motor	Perform auto active test. Does the applicable system operate?	YES	BCM signal input circuit
		NO	• Lamp or motor • Lamp or motor ground circuit • Harness or connector between IPDM E/R and applicable system • IPDM E/R

CONSULT Function (IPDM E/R)

INFOID:0000000007815238

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-21, "DTC Index".

DATA MONITOR

Monitor item

Monitor Item [Unit]	MAIN SIGNALS	Description
AC COMP REQ [Off/On]	×	**NOTE:** The item is indicated, but not monitored.
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 power switch ON signal received from BCM via CAN communication.
IGN RLY [Off/On]	×	Displays the status of the ignition relay judged by IPDM E/R.
PUSH SW [Off/On]		Displays the status of the power switch judged by IPDM E/R.
INTER/NP SW [Off/On]		**NOTE:** The item is indicated, but not monitored.
ST RLY CONT [Off/On]		**NOTE:** The item is indicated, but not monitored.
IHBT RLY -REQ [Off/On]		**NOTE:** The item is indicated, but not monitored.
ST/INHI RLY [Off/ ST ON/INHI ON/UNKWN]		**NOTE:** The item is indicated, but not monitored.
DETENT SW [Off/On]		Displays the status of the P position signal judged by IPDM E/R.
S/L RLY -REQ [Off/On]		**NOTE:** The item is indicated, but not monitored.
S/L STATE [LOCK/UNLK/UNKWN]		**NOTE:** The item is indicated, but not monitored.
DTRL REQ [Off/On]		Displays the status of the daytime running light request signal received from BCM via CAN communication. **NOTE:** This item is monitored only for vehicle with the daytime running light system.
OIL P SW [Open/Close]		**NOTE:** The item is indicated, but not monitored.
HOOD SW [Off/On]		Displays the status of the hood switch judged by IPDM E/R. **NOTE:** This item is monitored only for vehicle with the vehicle security system.
HL WASHER REQ [Off/On]		**NOTE:** The item is indicated, but not monitored.
THFT HRN REQ [Off/On]		Displays the status of the theft warning horn request signal received from BCM via CAN communication.
HORN CHIRP [Off/On]		Displays the status of the horn reminder signal received from BCM via CAN communication.

ACTIVE TEST

Test item

Test item	Operation	Description
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	**NOTE:** This item is indicated, but cannot be tested.
	2	
	3	
	4	
HEAD LAMP WASHER	On	**NOTE:** This item is indicated, but cannot be tested.
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.

ECU DIAGNOSIS INFORMATION

BCM, IPDM E/R

List of ECU Reference

INFOID:0000000007631592

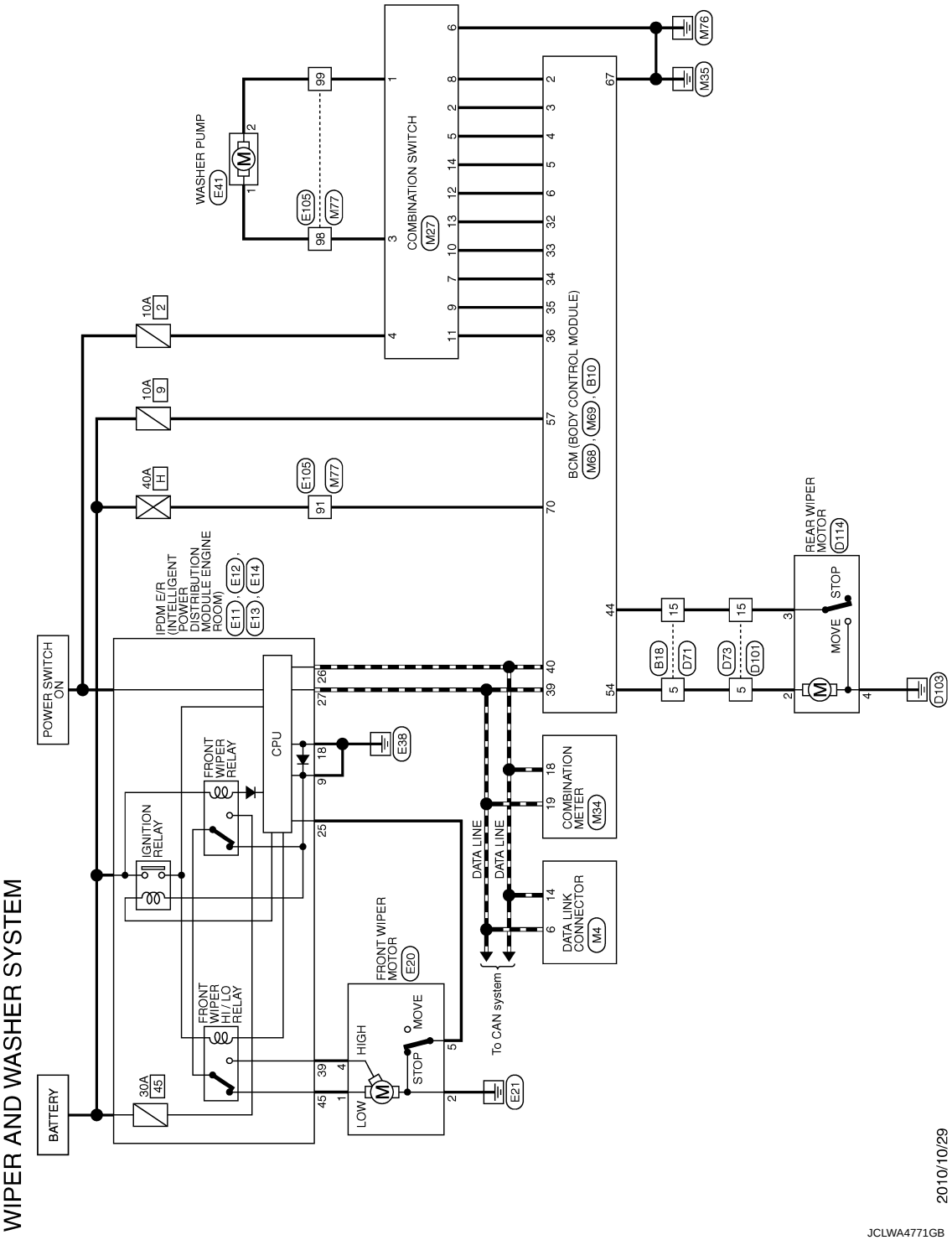
ECU	Reference
BCM	BCS-34, "Reference Value"
	BCS-54, "Fail-safe"
	BCS-55, "DTC Inspection Priority Chart"
	BCS-56, "DTC Index"
IPDM E/R	PCS-16, "Reference Value"
	PCS-20, "Fail-Safe"
	PCS-21, "DTC Index"

WIRING DIAGRAM

WIPER AND WASHER SYSTEM

Wiring Diagram

INFOID:0000000007631593



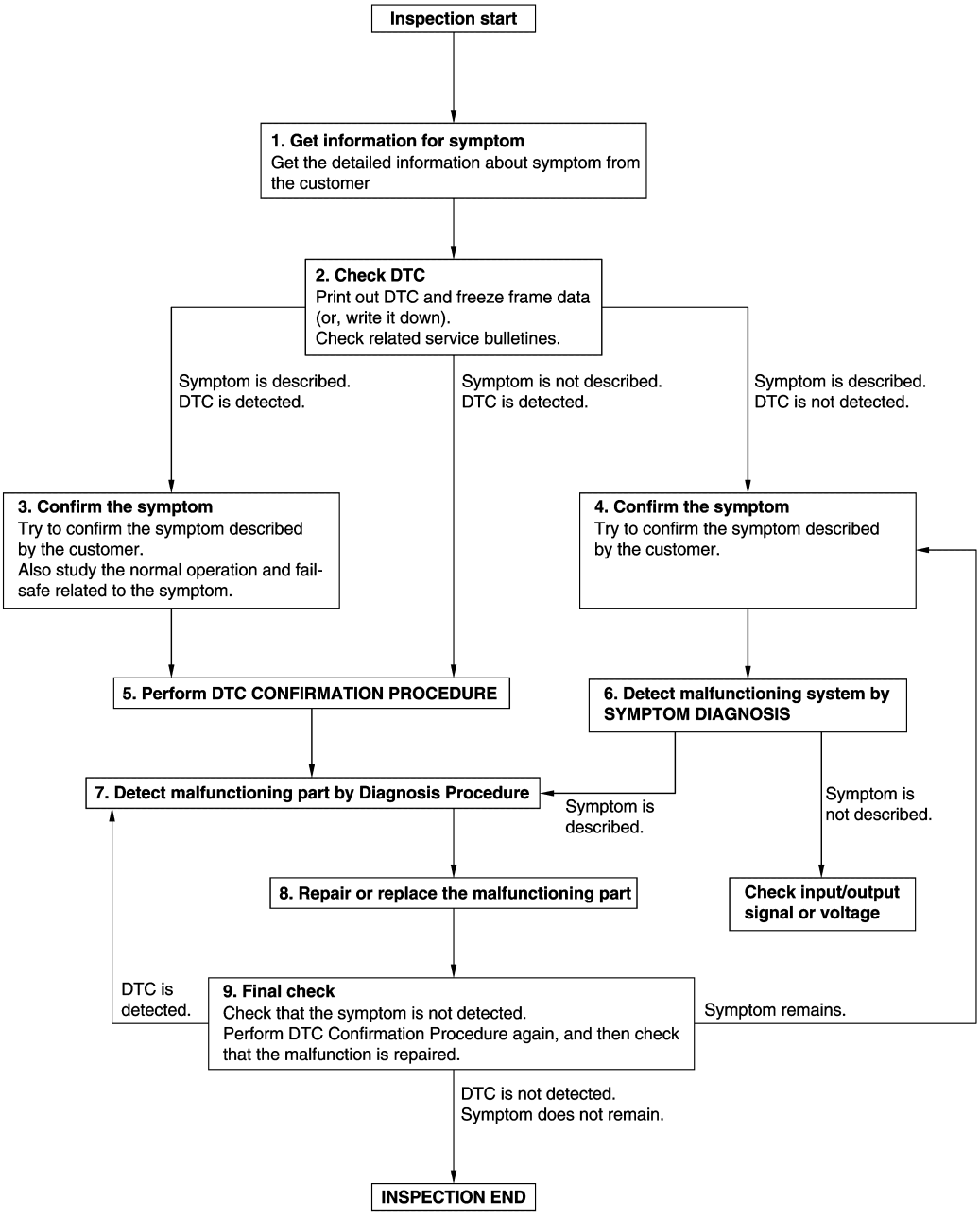
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000007631594

OVERALL SEQUENCE



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DETAILED FLOW

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-55, "DTC Inspection Priority Chart" (BCM) or PCS-21, "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-51, "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 DIAGNOSTIC PROCEDURE

Inspect according to Diagnostic Procedure of the system.

Is malfunctioning part detected?

YES >> GO TO 8.
NO >> Check according to GI-51, "Intermittent Incident".

8. REPAIR OR REPLACE THE MALFUNCTIONING PART

1. Repair or replace the malfunctioning part.
2. Reconnect parts or connectors disconnected during Diagnostic 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.

DTC/CIRCUIT DIAGNOSIS

WIPER AND WASHER FUSE

Diagnosis Procedure

INFOID:0000000007631595

1.CHECK FUSES

Check that the following fuses is not fusing.

Unit	Location	No.	Capacity
Front wiper motor	IPDM E/R	45	30 A
Washer pump	Fuse block (J/B)	2	10 A

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace the fuse with a new one after repairing the applicable circuit.

FRONT WIPER MOTOR LO CIRCUIT

Component Function Check

INFOID:0000000007631596

1.CHECK FRONT WIPER LO OPERATION

With CONSULT
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-30, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000007631597

1.CHECK FRONT WIPER MOTOR (LO) OUTPUT VOLTAGE

With CONSULT
1. Turn power switch OFF.
2. Disconnect front wiper motor connector.
3. Turn power 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	1	Ground	FRONT WIPER	Lo	Battery voltage
				Off	0 V

Is the inspection result normal?

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

2.CHECK FRONT WIPER MOTOR (LO) CIRCUIT

1. Turn power 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	E20	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

Component Function Check

INFOID:0000000007631598

1.CHECK FRONT WIPER HI OPERATION

With CONSULT
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-31, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000007631599

1.CHECK FRONT WIPER MOTOR (HI) OUTPUT VOLTAGE

With CONSULT
1. Turn power switch OFF.
2. Disconnect front wiper motor connector.
3. Turn power 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	4	Ground	FRONT WIPER	Hi	Battery voltage
				Off	0 V

Is the inspection result normal?

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

2.CHECK FRONT WIPER MOTOR (HI) CIRCUIT

1. Turn power 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	E20	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

Component Function Check

INFOID:0000000007631600

1.CHECK FRONT WIPER STOP POSITION SIGNAL

With CONSULT
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-32, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000007631601

1.CHECK IPDM E/R OUTPUT VOLTAGE

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

(+)		(–)	Voltage (Approx.)
Front wiper motor			
Connector	Terminal		
E20	5	Ground	Battery voltage

Is the inspection result normal?

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

2.CHECK FRONT WIPER MOTOR CIRCUIT

1. Turn power 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	E20	5	Existed

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

IPDM E/R		Ground	Continuity
Connector	Terminal		
E13	25		Not existed

Is the inspection result normal?

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

FRONT WIPER MOTOR GROUND CIRCUIT

Diagnosis Procedure

INFOID:0000000007631602

1.CHECK FRONT WIPER MOTOR GROUND CIRCUIT

1. Turn power 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		
E20	2		Existed

Is the inspection result normal?

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

WASHER SWITCH

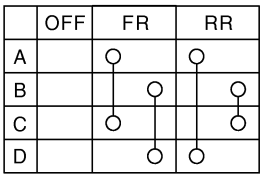
Component Inspection

INFOID:0000000007631603

1.CHECK WASHER SWITCH

1. Turn power 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



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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 (Wiper and washer switch).

REAR WIPER MOTOR CIRCUIT

Component Function Check

INFOID:0000000007631604

1.CHECK REAR WIPER ON OPERATION

With CONSULT
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:0000000007631605

1.CHECK REAR WIPER MOTOR OUTPUT VOLTAGE

With CONSULT
1. Turn power switch OFF.
2. Disconnect rear wiper motor connector.
3. Turn power 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				
D114	2	Ground	REAR WIPER	On	Battery voltage
				Off	0 V

Is the inspection result normal?

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

2.CHECK REAR WIPER MOTOR CIRCUIT

1. Turn power 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	
B10	54	D114	2	Existed

4. Check continuity between BCM harness connector and ground.

BCM		Ground	Continuity
Connector	Terminal		
B10	54		Not existed

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-77, "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		Ground	Continuity
Connector	Terminal		
D114	4		Existed

Is the inspection result normal?

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

REAR WIPER STOP POSITION SIGNAL CIRCUIT

Component Function Check

INFOID:0000000007631606

1.CHECK REAR WIPER STOP POSITION SIGNAL

With CONSULT
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:0000000007631607

1.CHECK REAR WIPER MOTOR OUTPUT VOLTAGE

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

(+)		(–)	Voltage (Approx.)
Rear wiper motor			
Connector	Terminal		
D114	3	Ground	Battery voltage

Is the inspection result normal?

YES >> Replace rear wiper motor.
NO >> GO TO 2.

2.CHECK REAR WIPER MOTOR CIRCUIT

1. Turn power 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	
B10	44	D114	3	Existed

4. Check continuity between BCM harness connector and ground.

BCM		Ground	Continuity
Connector	Terminal		
B10	44		Not existed

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-77, "Removal and Installation".
NO >> Repair or replace harness.

SYMPTOM DIAGNOSIS

WIPER AND WASHER SYSTEM SYMPTOMS

Symptom Table

INFOID:0000000007631608

Symptom		Probable malfunction location	Inspection item
Front wiper does not operate	HI only	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-76, "Symptom Table".
		• IPDM E/R • Harness between IPDM E/R and front wiper motor • Front wiper motor	Front wiper motor (HI) circuit Refer to WW-31, "Component Function Check".
		Front wiper request signal • BCM • IPDM E/R	IPDM E/R Data monitor “FR WIP REQ”
	LO and INT	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-76, "Symptom Table".
		• IPDM E/R • Harness between IPDM E/R and front wiper motor • Front wiper motor	Front wiper motor (LO) circuit Refer to WW-30, "Component Function Check".
		Front wiper request signal • BCM • IPDM E/R	IPDM E/R Data monitor “FR WIP REQ”
	INT only	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-76, "Symptom Table".
		Front wiper request signal • BCM • IPDM E/R	IPDM E/R Data monitor “FR WIP REQ”
	HI, LO and INT	SYMPTOM DIAGNOSIS Refer to WW-41, "Diagnosis Procedure".	
Front wiper does not stop	HI only	• Combination switch • BCM	Combination switch Refer to BCS-76, "Symptom Table".
		Front wiper request signal • BCM • IPDM E/R	IPDM E/R Data monitor “FR WIP REQ”
		IPDM E/R	—
	LO only	• Combination switch • BCM	Combination switch Refer to BCS-76, "Symptom Table".
		Front wiper request signal • BCM • IPDM E/R	IPDM E/R Data monitor “FR WIP REQ”
		IPDM E/R	—
	INT only	• Combination switch • BCM	Combination switch refer to BCS-76, "Symptom Table".
		Front wiper request signal • BCM • IPDM E/R	IPDM E/R Data monitor “FR WIP REQ”

Symptom		Probable malfunction location	Inspection item
Front wiper does not operate normally	Intermittent adjustment cannot be performed	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-76, "Symptom Table".
		BCM	—
	Intermittent control linked with vehicle speed cannot be performed	Check the wiper setting is linked with vehicle speed. Refer to WW-19, "WIPER : CONSULT Function - WIPER".	
	Service positioning operation does not operate	• Combination switch • BCM • IPDM E/R	Combination switch Refer to BCS-76, "Symptom Table".
	Wiper is not linked to the washer operation	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-76, "Symptom Table".
		BCM	—
	Does not return to stop position [Repeatedly operates for 10 seconds and then stops for 20 seconds. After that, it stops the operation. (Fail-safe)]	• IPDM E/R • Harness between IPDM E/R and front wiper motor • Front wiper motor	Front wiper stop position signal circuit Refer to WW-32, "Component Function Check".
Rear wiper does not operate	ON only	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-76, "Symptom Table".
	INT only	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-76, "Symptom Table".
	ON and INT	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-76, "Symptom Table".
		• BCM • Harness between rear wiper motor and BCM • Harness between rear wiper motor and ground • Rear wiper motor	Rear wiper motor circuit Refer to WW-35, "Component Function Check".
Rear wiper does not stop	ON only	• Combination switch • BCM	Combination switch Refer to BCS-76, "Symptom Table".
	INT only	• Combination switch • BCM	Combination switch Refer to BCS-76, "Symptom Table".
Rear wiper does not operate normally	Wiper is not linked to the washer operation	• Combination switch • Harness between rear wiper motor and BCM • BCM	Combination switch Refer to BCS-76, "Symptom Table".
		BCM	—
	Rear wiper does not return to the stop position. [Stops after a five-second operation. (Fail-safe)]	• BCM • Harness between rear wiper motor and BCM • Rear wiper motor	Rear wiper stop position signal circuit Refer to WW-37, "Component Function Check".

NORMAL OPERATING CONDITION

Description

INFOID:0000000007631609

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

Description

INFOID:0000000007631610

The front wiper does not operate under any operation conditions.

Diagnosis Procedure

INFOID:0000000007631611

1.CHECK WIPER RELAY OPERATION

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

Lo : Front wiper LO operation
Hi : Front wiper HI operation
Off : Stop the front wiper.

Is front wiper operation normally?

YES >> GO TO 5.
NO >> GO TO 2.

2.CHECK FRONT WIPER MOTOR FUSE

Check that the following fuses is not fusing.

Unit	Location	No.	Capacity
Front wiper motor	IPDM E/R	45	30 A
Washer pump	Fuse block (J/B)	2	10 A

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace the fuse after repairing the applicable circuit.

3.CHECK FRONT WIPER MOTOR GROUND CIRCUIT

Check front wiper motor ground circuit. Refer to WW-33, "Diagnosis Procedure".

Is the inspection result normal?

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

4.CHECK FRONT WIPER MOTOR INPUT VOLTAGE

With CONSULT
1. Turn power switch OFF.
2. Disconnect front wiper motor connector.
3. Turn power 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	1	Ground	FRONT WIPER	Lo	Battery voltage
				Off	0 V
	4			Hi	Battery voltage
				Off	0 V

Is the inspection result normal?

YES >> Replace front wiper motor.
NO >> Replace IPDM E/R.

5. CHECK FRONT WIPER REQUEST SIGNAL INPUT

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

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

Is the inspection result normal?

YES >> Replace IPDM E/R.
NO >> GO TO 6.

6. CHECK COMBINATION SWITCH

Perform the inspection of the combination switch. Refer to BCS-76, "Symptom Table".

Is combination switch normal?

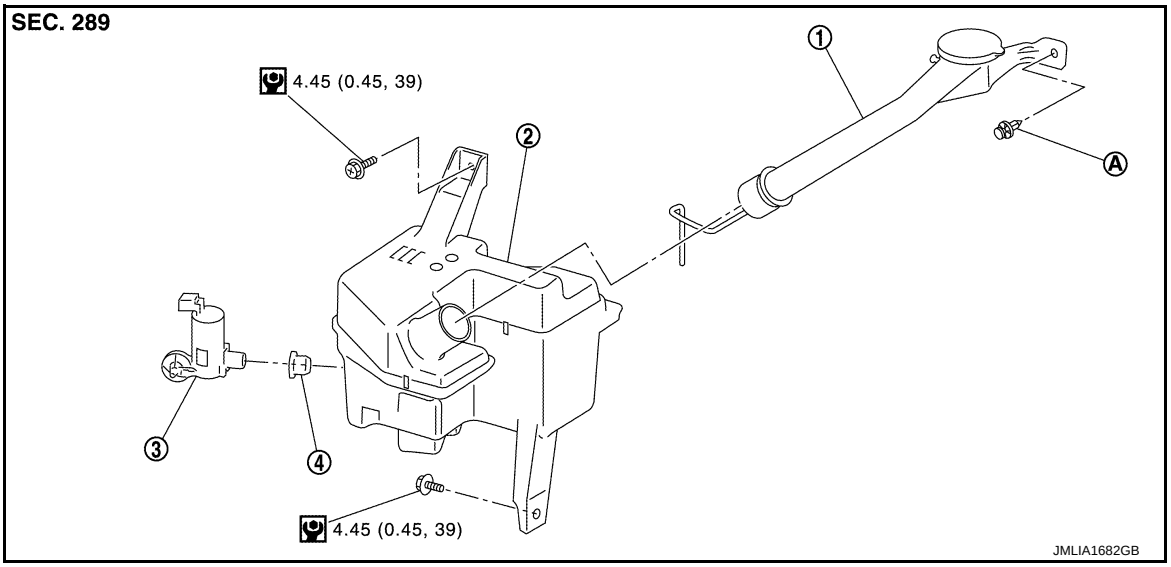
YES >> Replace BCM. Refer to BCS-77, "Removal and Installation".
NO >> Repair or replace the applicable parts.

REMOVAL AND INSTALLATION

WASHER TANK

Exploded View

INFOID:0000000007631612



1. Washer tank inlet
2. Washer tank
3. Washer pump
4. Packing

A : Clip

: N·m (kg·m, in-lb)

Removal and Installation

INFOID:0000000007631613

REMOVAL

1. Fully open hood.
2. Remove washer tank inlet fixing clip.
3. Pull out washer tank inlet from washer tank.
4. Remove front bumper fascia. Refer to EXT-13, "Removal and Installation".
5. Disconnect washer pump harness connector and remove the fixing clip.
6. Disconnect washer level switch harness connector (if equipped).
7. Disconnect front washer tube and rear washer tube.
8. Remove washer tank mounting bolts.
9. Remove washer tank.

INSTALLATION

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

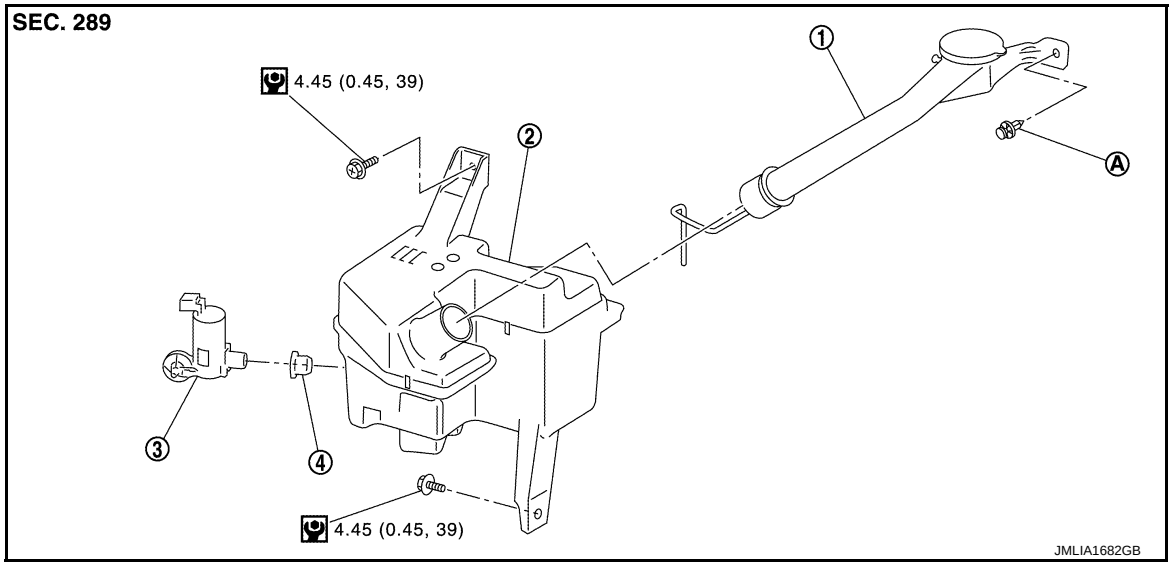
CAUTION:

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

WASHER PUMP

Exploded View

INFOID:0000000007631614



1. Washer tank inlet
2. Washer tank
3. Washer pump
4. Packing

A : Clip

: N·m (kg·m, in-lb)

Removal and Installation

INFOID:0000000007631615

REMOVAL

1. Remove front bumper fascia. Refer to EXT-13, "Removal and Installation".
2. Disconnect washer pump harness connector.
3. Disconnect front washer tube and rear washer tube.
4. Remove washer pump from the washer tank.
5. Remove packing from washer tank.

INSTALLATION

Note the following items, 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 damage.**
- **Never twist the packing when installing the washer pump to prevent damage to the part.**

WASHER LEVEL SWITCH

Removal and Installation

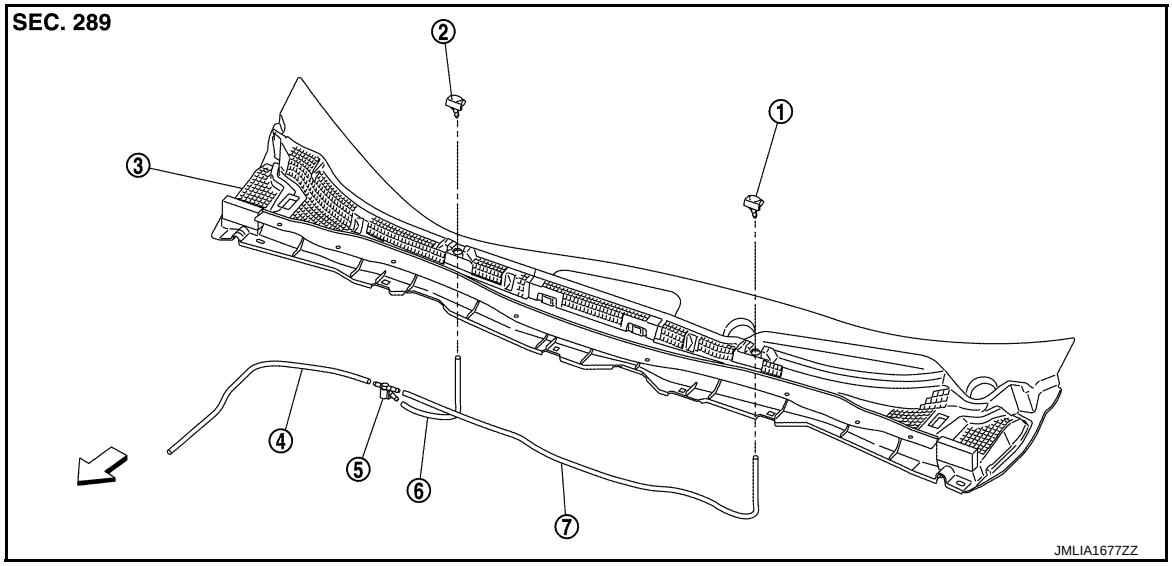
INFOID:0000000007631616

The washer level switch must be replaced together with the washer tank as an assembly. Refer to WW-43, "Removal and Installation".

FRONT WASHER NOZZLE AND TUBE

Exploded View

INFOID:0000000007631617

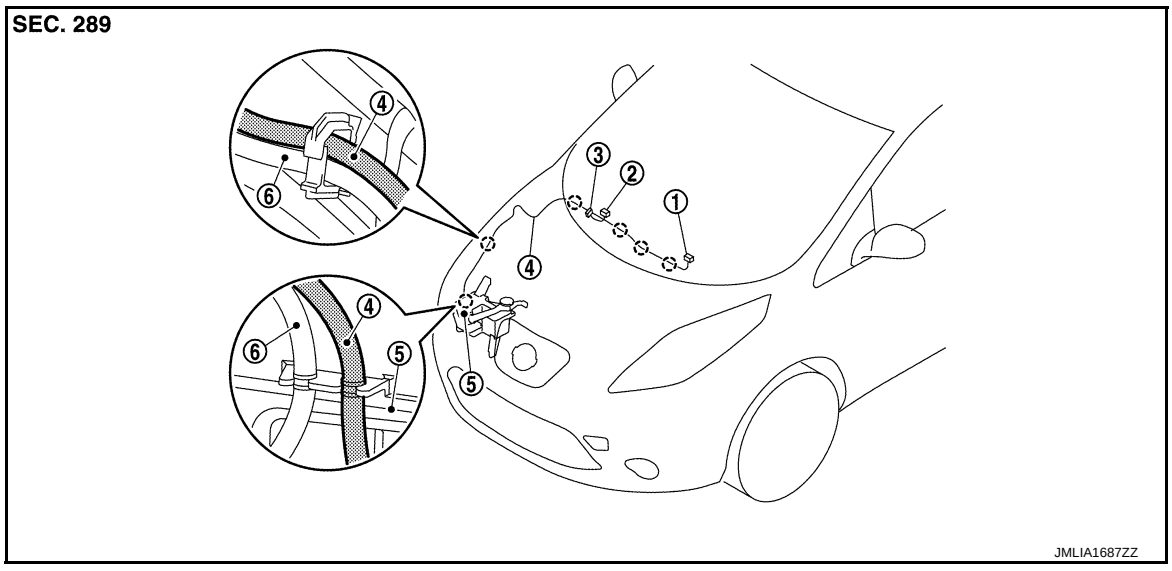


1. Front washer nozzle LH
2. Front washer nozzle RH
3. Cowl top cover
4. Front washer tube (tank side)
5. Check valve
6. Front washer tube RH
7. Front washer tube LH

⇦ : Vehicle front

Hydraulic Layout

INFOID:0000000007631618



1. Front washer nozzle LH
2. Front washer nozzle RH
3. Check valve
4. Front washer tube
5. Washer tank
6. Rear washer tube

◌ : Clip

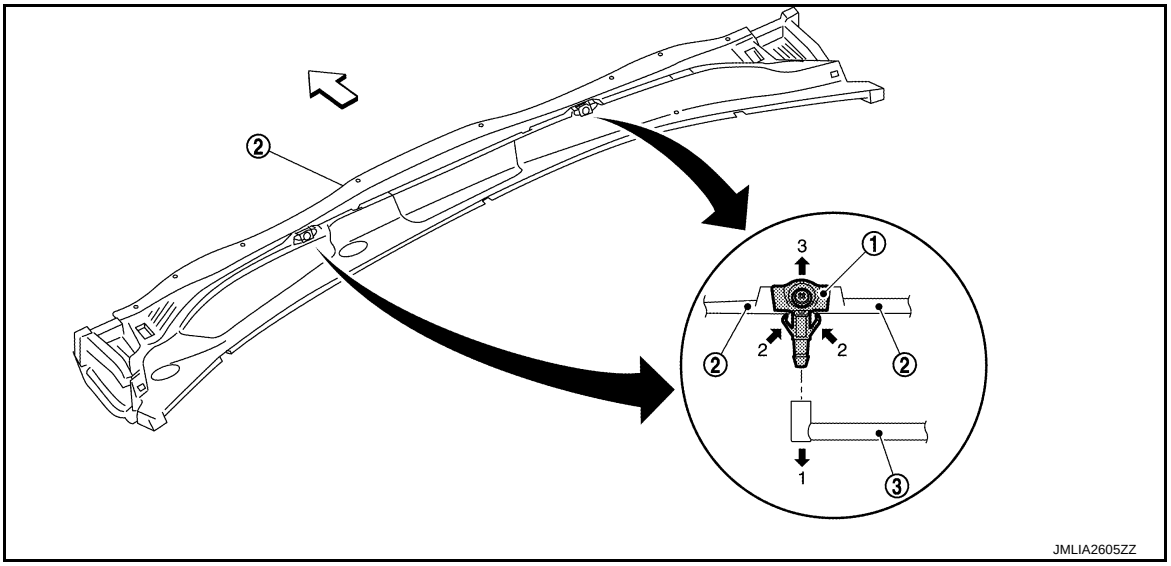
Removal and Installation

INFOID:0000000007631619

REMOVAL

1. Fully open hood assembly.

2. Remove front washer nozzle.



⇦ : Vehicle front

a. Remove cowl top cover (2). Refer to EXT-19, "Removal and Installation".
b. Remove front washer tube (3) from front washer nozzle (1).
c. Press front washer nozzle fixing pawls toward the direction shown by the arrows 2 and pull up to remove.

INSTALLATION

1. Install front washer nozzle into the cowl top cover.
   CAUTION:
   The spray positions differ, check that left and right nozzles are installed correctly.
2. Connect front washer tube to the front washer nozzle.
3. Adjust the front washer nozzle spray position. Refer to WW-47, "Inspection and Adjustment".

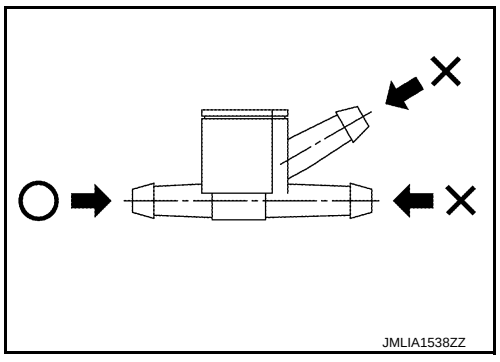
Inspection and Adjustment

INFOID:0000000007631620

INSPECTION

Washer Nozzle Inspection

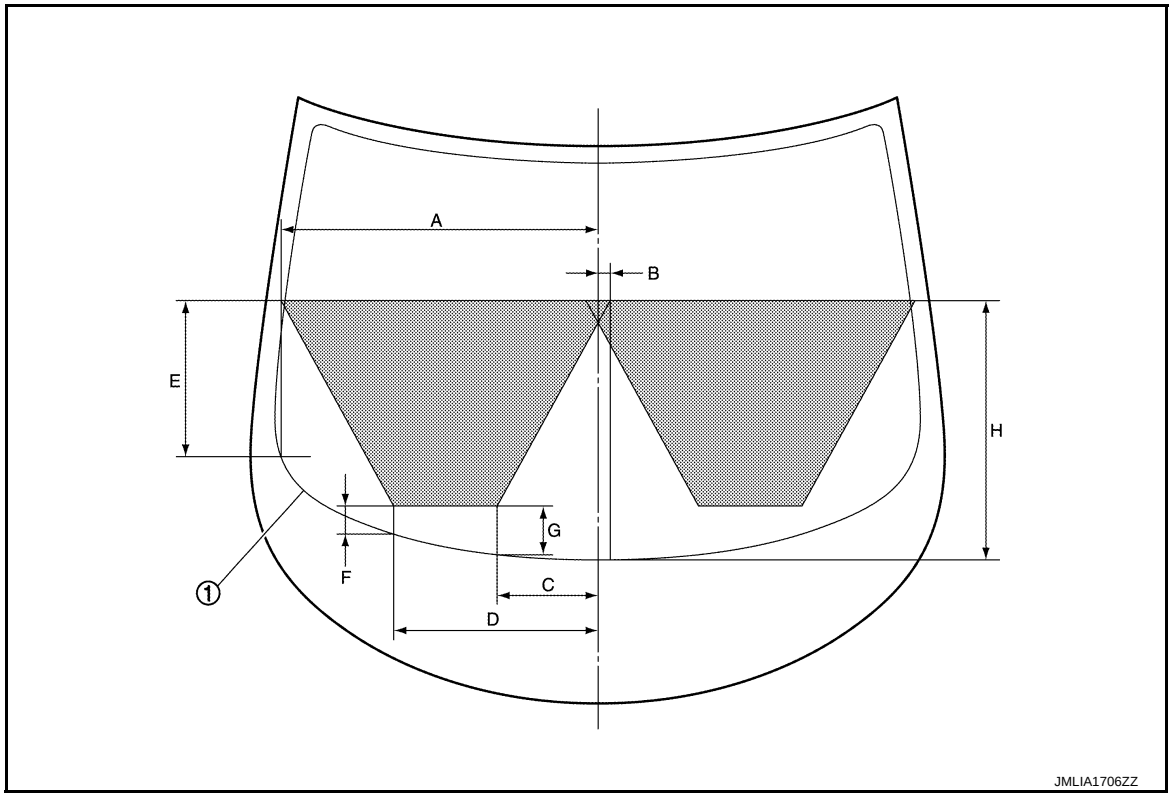
Check that air can pass through the hose by blowing forward (toward the nozzle), and check that air cannot pass through by sucking.



ADJUSTMENT

Washer Nozzle Spray Position Adjustment

Adjust spray positions to match the positions shown in the figure.
NOTE:
The spray position in the passenger side is similar to the one in the driver side.



1. Black printed frame line

: Spray area

Unit: mm (in)

Driver and Passenger side							
A	B	C	D	E	F	G	H
626.0 (24.65)	29.2 (1.15)	193.1 (7.60)	399.7 (15.74)	344.0 (13.54)	58.4 (2.30)	105.4 (4.15)	547.3 (21.55)

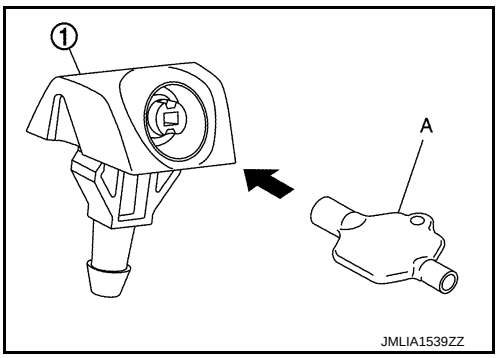
CAUTION:

- **Use washer nozzle adjuster* (A) for nozzle adjustment.**
- **Never use needle or small pin.**

(Washer nozzle adjuster is included with shipment of nozzle)

NOTE:

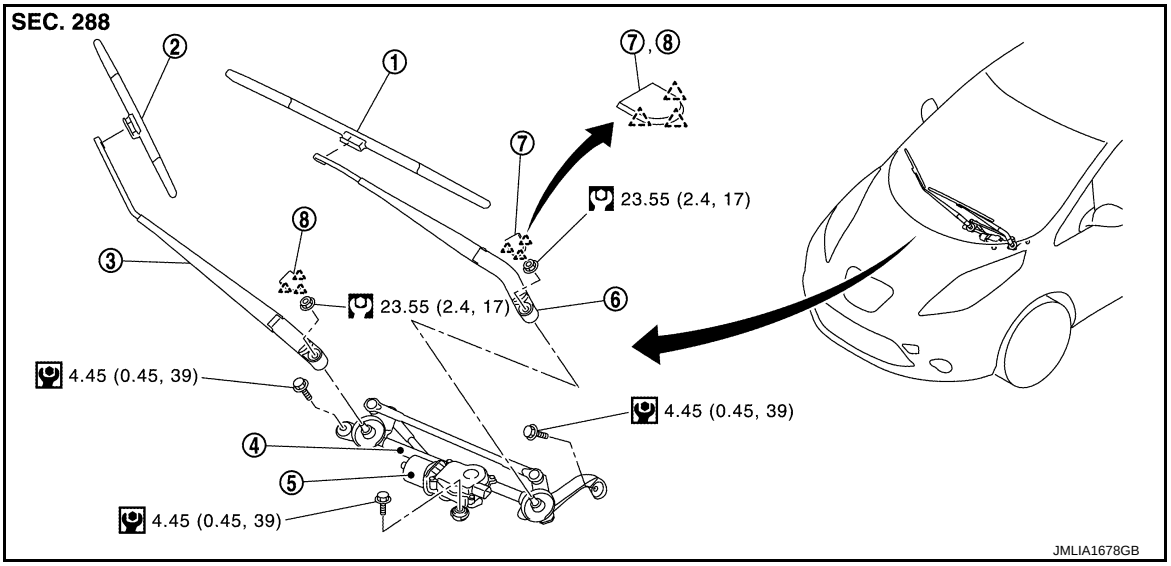
If wax or dust gets into the front washer nozzle (1), remove wax or dust with a needle or small pin.



FRONT WIPER ARM

Exploded View

INFOID:0000000007631621



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

: Pawl

: N·m (kg-m, in-lb)

: N·m (kg-m, ft-lb)

Removal and Installation

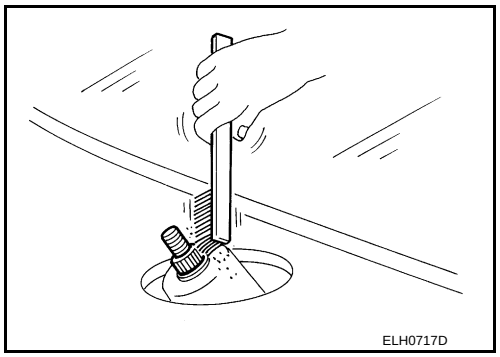
INFOID:0000000007631622

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-50, "Adjustment".
4. Install front wiper arm by tightening the mounting nuts.

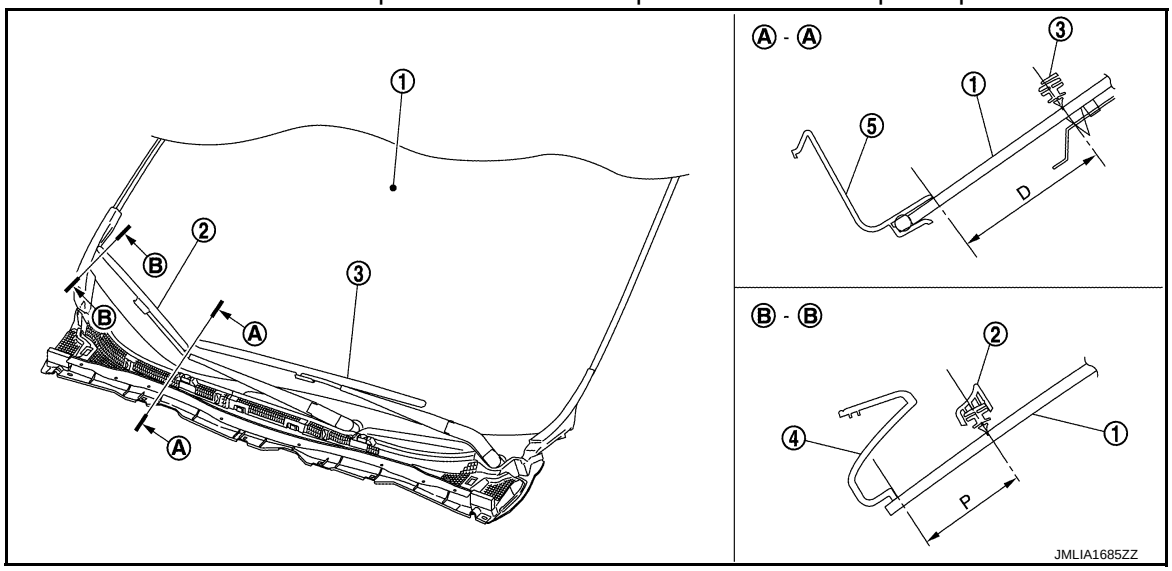
5. Inject the washer fluid.
6. Operate front wiper to move it to the auto stop position.
7. Check that the front wiper blades stop at the specified position.
8. Install front wiper arm caps.

Adjustment

INFOID:0000000007631623

WIPER BLADE POSITION ADJUSTMENT

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



1. Windshield glass assembly
2. Front wiper blade RH
3. Front wiper blade LH
4. Front fender cover
5. Cowl top cover

Standard clearance

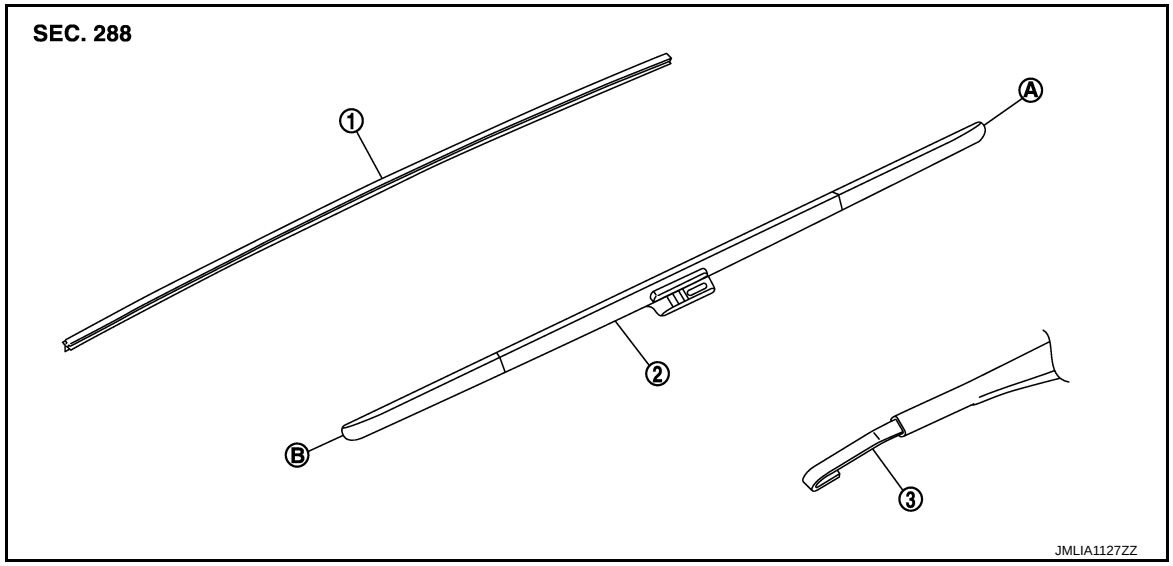
D : 86.2 ± 7.5 mm (3.394 ± 0.295 in)

P : 48.5 ± 7.5 mm (1.909 ± 0.295 in)

FRONT WIPER BLADE

Exploded View

INFOID:0000000007631624



1. Wiper refill
2. Wiper blade
3. Wiper arm

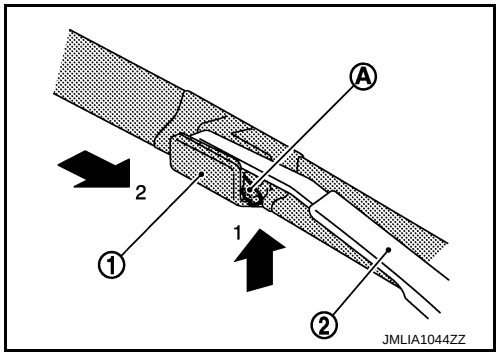
A : Wiper blade end
B : Wiper blade tip

Removal and Installation

INFOID:0000000007631625

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 to prevent damege to the windshield glass.



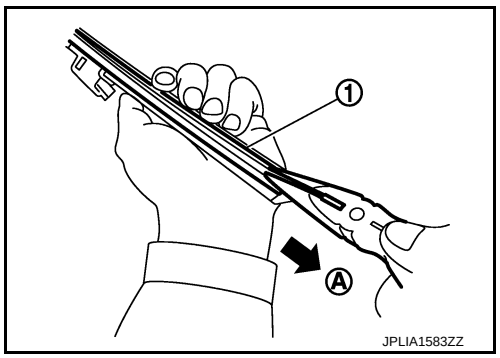
INSTALLATION

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

Replacement

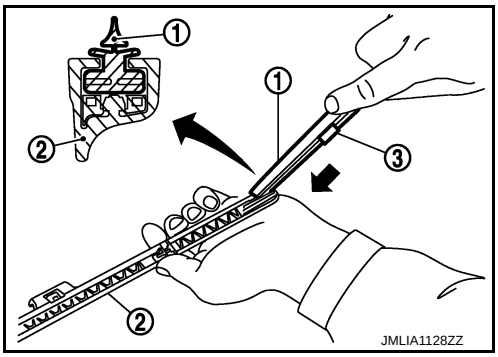
INFOID:0000000007631626

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).

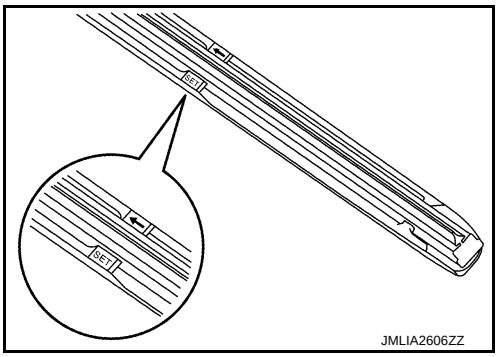


2. Insert the tip of new wiper refill (1) into the rear end of wiper blade (2). Slide the new wiper refill to the direction shown by the arrow while pressing the new wiper refill onto the wiper blade rear end.
   NOTE:
   - Insert the wiper refill to be held securely by tab of wiper blade as shown in section.
   - After the wiper refill is fully inserted, remove the holder* (3).

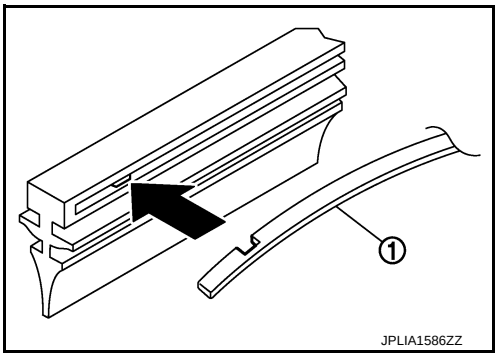
   *: Attached to service parts.



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.

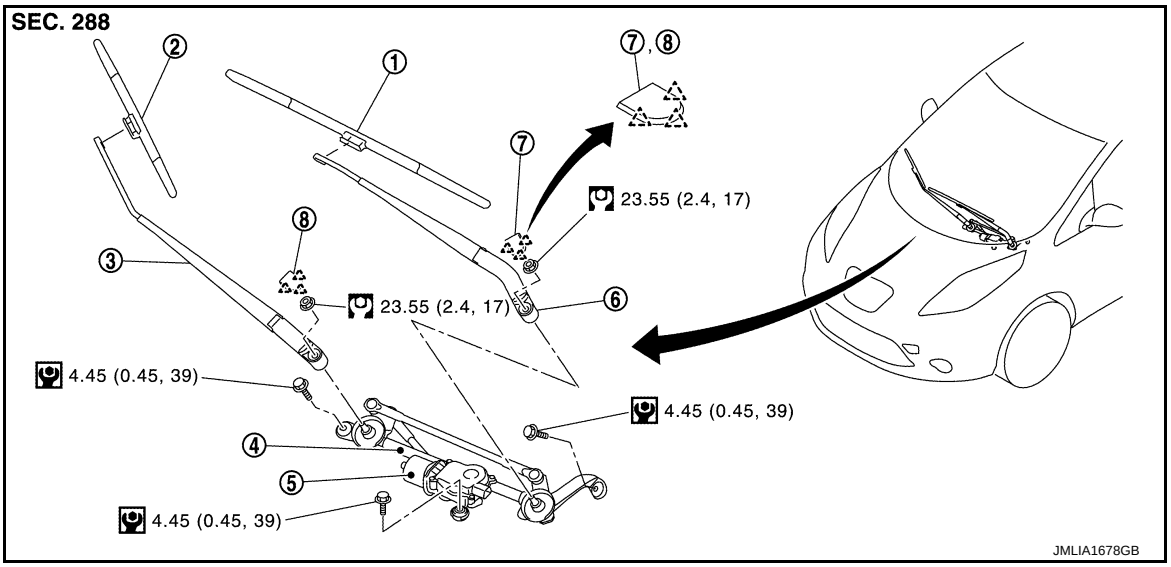


FRONT WIPER DRIVE ASSEMBLY

Exploded View

INFOID:0000000007631627

REMOVAL



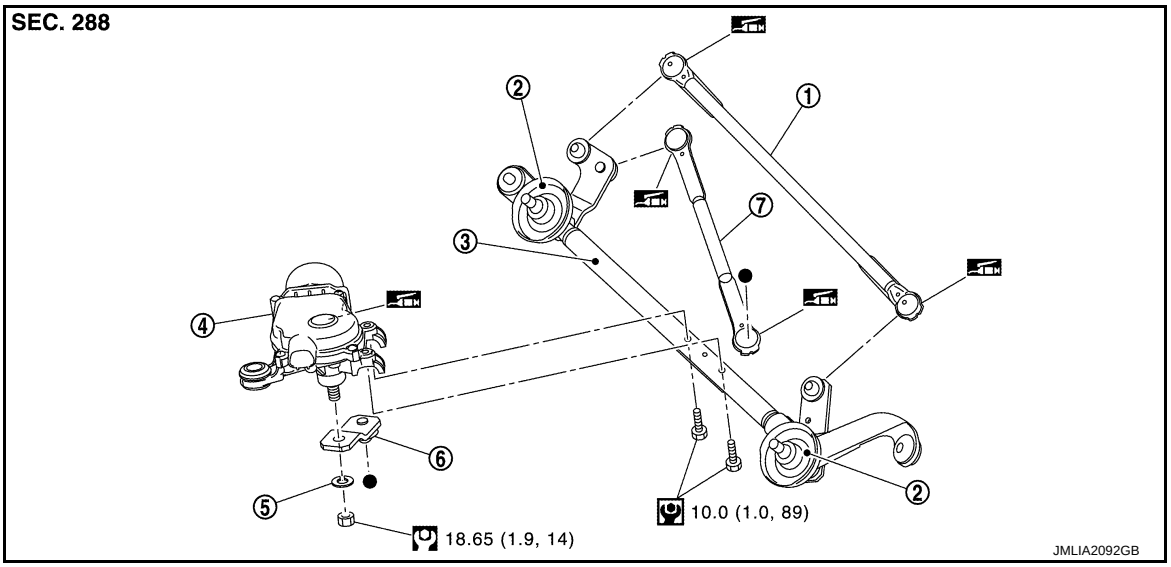
1. Front wiper blade LH
2. Front wiper blade RH
3. Front wiper arm RH
4. Front wiper drive assembly
5. Front wiper motor
6. Front wiper arm LH
7. Front wiper arm cap LH
8. Front wiper arm cap RH

: Pawl

: N·m (kg-m, in-lb)

: N·m (kg-m, ft-lb)

DISASSEMBLY



1. Front wiper linkage 2
2. Shaft seal
3. Front wiper frame
4. Front wiper motor
5. Retaining washer
6. Front wiper motor arm
7. Front wiper linkage 1

: N·m (kg-m, in-lb)

: N·m (kg-m, ft-lb)

: Nissan MP special grease No.2

Removal and Installation

INFOID:0000000007631628

REMOVAL

1. Remove front wiper arms (LH and RH). Refer to WW-49, "Removal and Installation".
2. Remove cowl top cover. Refer to EXT-19, "Removal and Installation".
3. Disconnect the front wiper motor harness 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 harness connector.
3. Operate front wiper to move it to the auto stop position.
4. Install cowl top cover. Refer to EXT-19, "Removal and Installation".
5. Install front wiper arms. Refer to WW-49, "Removal and Installation".

Disassembly and Assembly

INFOID:0000000007631629

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 harness connector.
2. Operate the front wiper to move it to the auto stop position.
3. Disconnect the front wiper motor harness connector.
4. Install the front wiper motor to the front wiper frame.
5. Install the front wiper linkage 1 to the front wiper motor and to 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, to prevent damage to the wiper motor or to other parts around it.**
   - **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.**

WIPER AND WASHER SWITCH

Exploded View

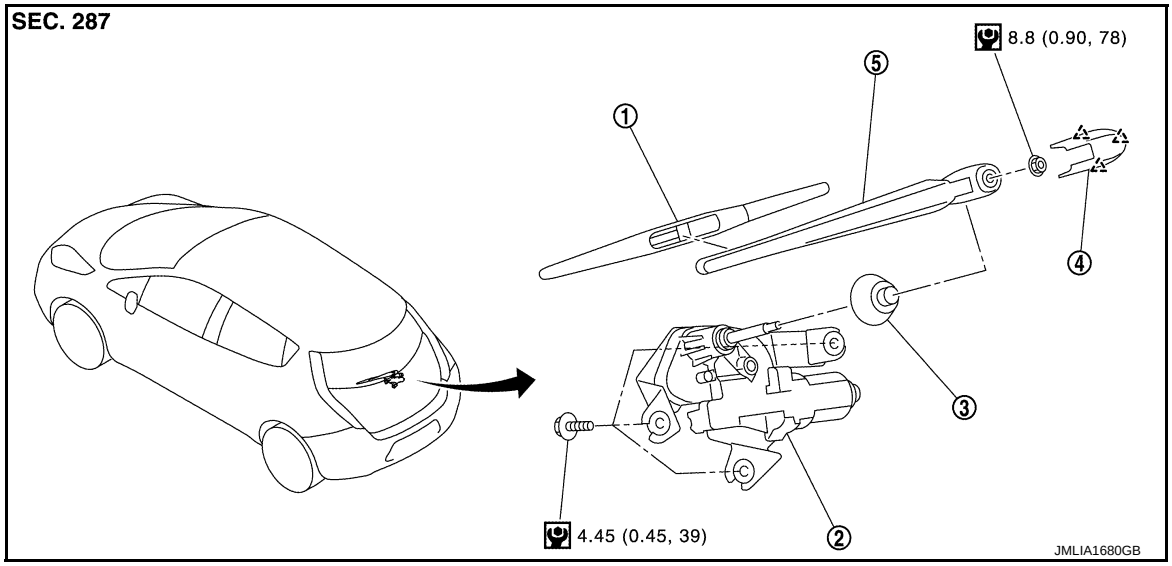
INFOID:0000000007631630

Wiper and washer switch is integrated in the combination switch. Refer to BCS-78, "Exploded View".

REAR WIPER ARM

Exploded View

INFOID:0000000007631631



1. Rear wiper blade
2. Rear wiper motor
3. Rear wiper pivot seal
4. Rear wiper arm cover
5. Rear wiper arm

: Pawl

: N·m (kg-m, in-lb)

Removal and Installation

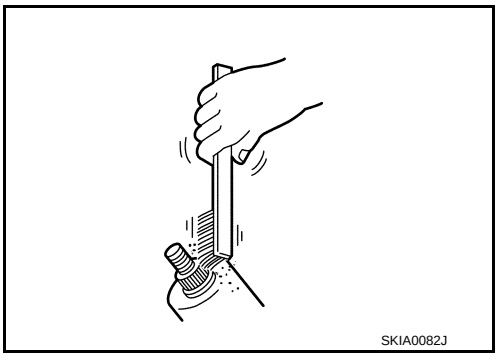
INFOID:0000000007631632

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-57, "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

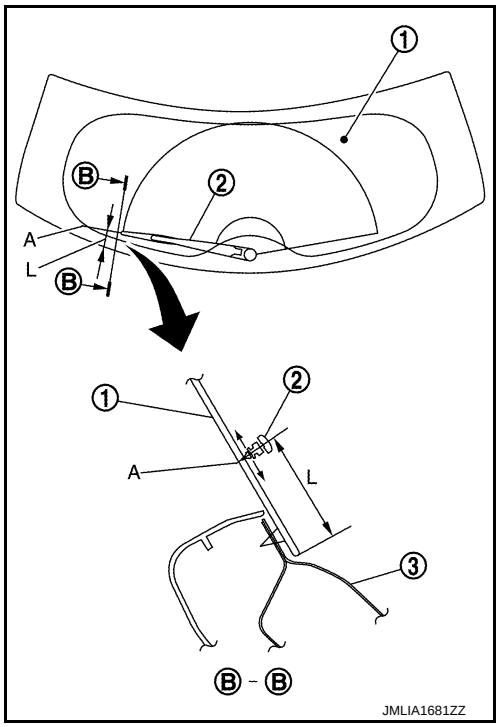
INFOID:0000000007631633

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).

Standard clearance

1. Back door window glass
2. Rear wiper blade
3. Back door outer panel
A : Rear defogger wire print
L : 53.1 ± 7.5 mm (2.091 ± 0.295in)



REAR WIPER MOTOR

Exploded View

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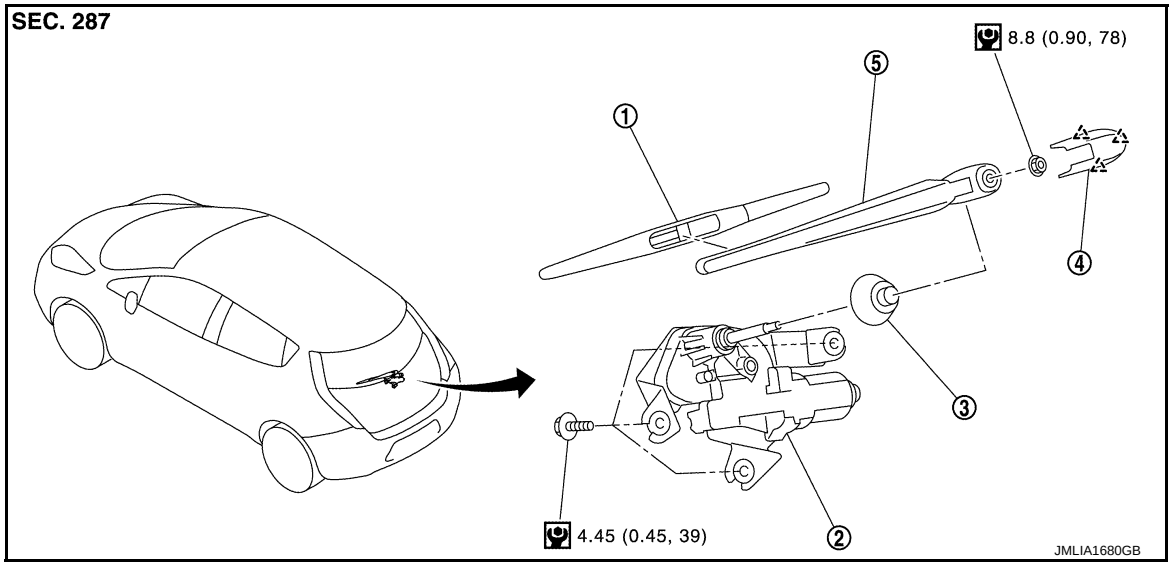

1. Rear wiper blade
2. Rear wiper motor
3. Rear wiper pivot seal
4. Rear wiper arm cover
5. Rear wiper arm

: Pawl

: N·m (kg-m, in-lb)

Removal and Installation

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REMOVAL

1. Remove rear wiper arm. Refer to WW-56, "Removal and Installation".
2. Remove back door lower finisher. Refer to INT-43, "BACK DOOR LOWER FINISHER : Removal and Installation".
3. Disconnect rear wiper motor harness 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

Hydraulic Layout

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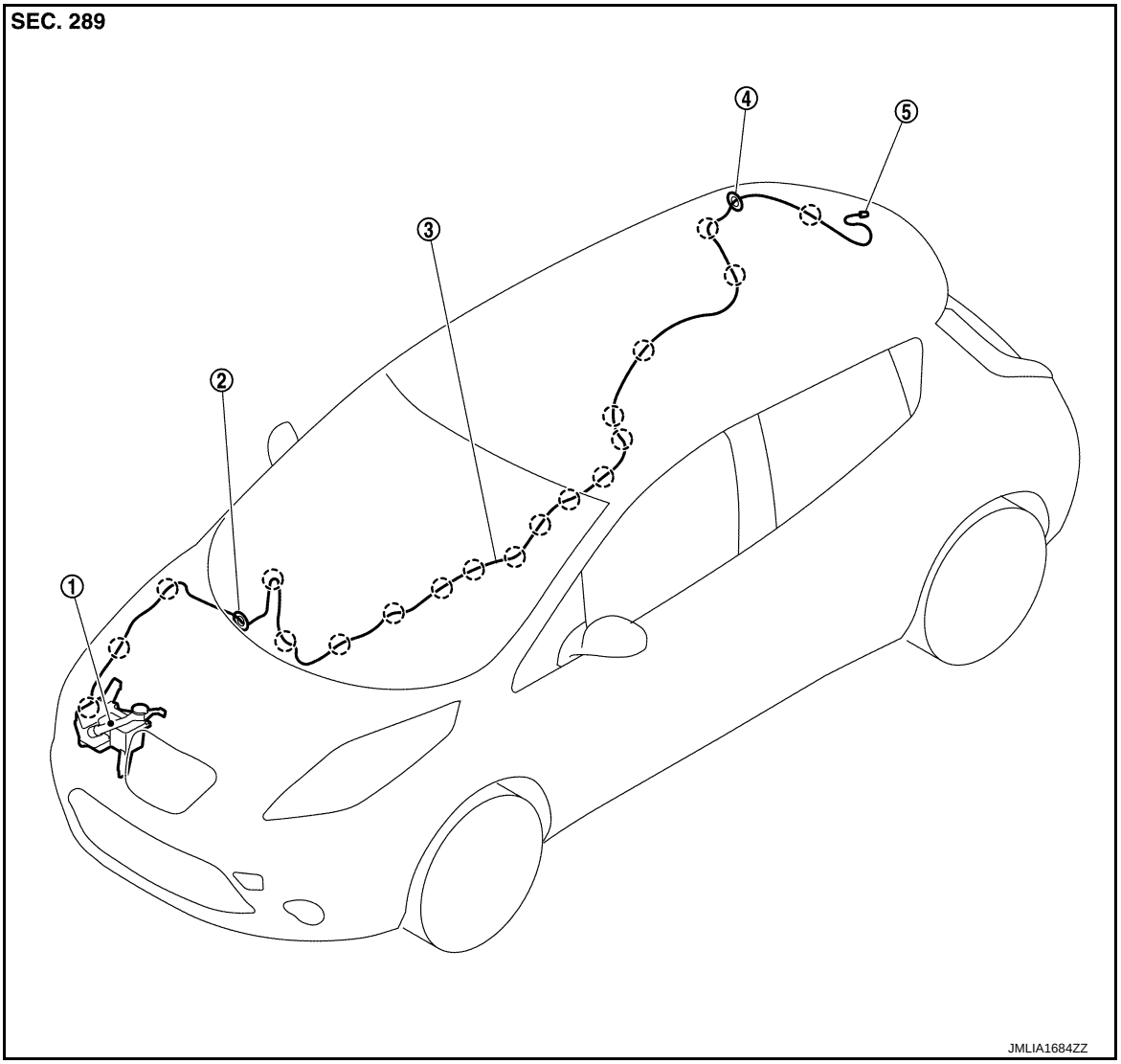

1. Washer tank
2. Front grommet
3. Rear washer tube
4. Rear grommet
5. Rear washer nozzle

◌ : Clip

Removal and Installation

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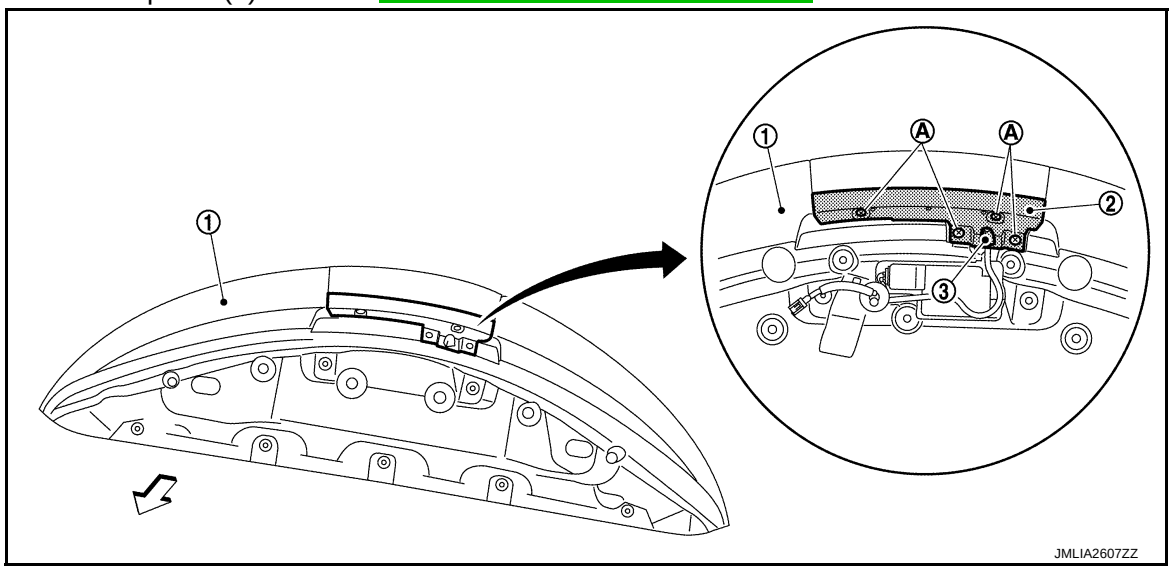
REMOVAL

1. Remove rear spoiler (1). Refer to EXT-36, "Removal and Installation".



⇦ : Vehicle front

2. Remove high-mounted stop lamp cover (2) mounting screws (A), and then remove the bracket.
3. Disconnect rear washer nozzle tube and remove rear washer nozzle (3) from the bracket.

INSTALLATION

Install in the reverse order of removal.

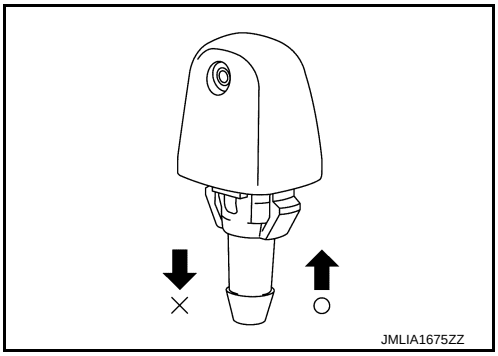
Inspection and Adjustment

INFOID:0000000007631638

INSPECTION

Washer Nozzle Inspection

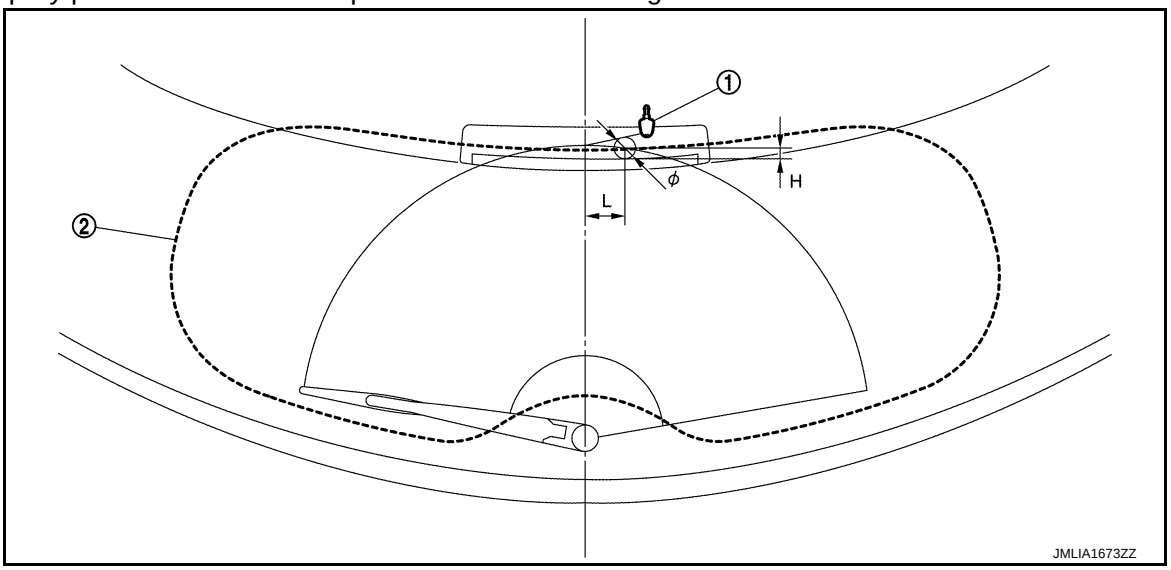
Check that air can pass through the hose by blowing forward (toward the nozzle), and check that air cannot pass through by sucking.



ADJUSTMENT

Washer Nozzle Spray Position adjustment

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



1. Rear washer nozzle
2. Black print frame line
H : 10.7 (0.42)
ϕ : 30 (1.18)
L : 31.6 (1.24)
Unit: mm (in)

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 spray opening of rear washer nozzle (2), remove wax or dust with a needle or small pin.