SECTION WW
WIPER & WASHER

CONTENTS

PRECAUTION

PRECAUTIONS

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

INFOID:0000000010260696

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:

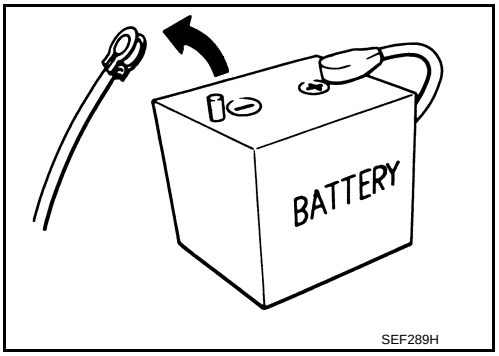
Always observe the following items for preventing accidental activation.

- **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.**

Precautions for Removing Battery Terminal

INFOID:0000000010260698

- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
  NOTE:
  ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.
  NOTE:
  If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

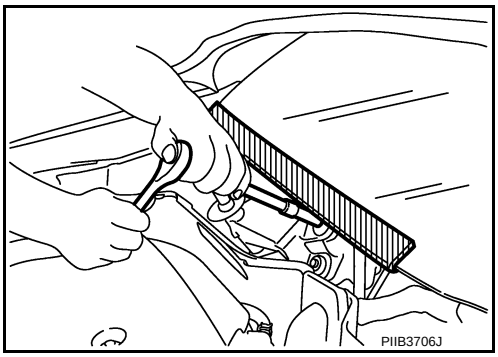


- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
  NOTE:
  The removal of 12V battery may cause a DTC detection error.

Precaution for Procedure without Cowl Top Cover

INFOID:0000000010260697

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



Precaution for Battery Service

INFOID:0000000011509830

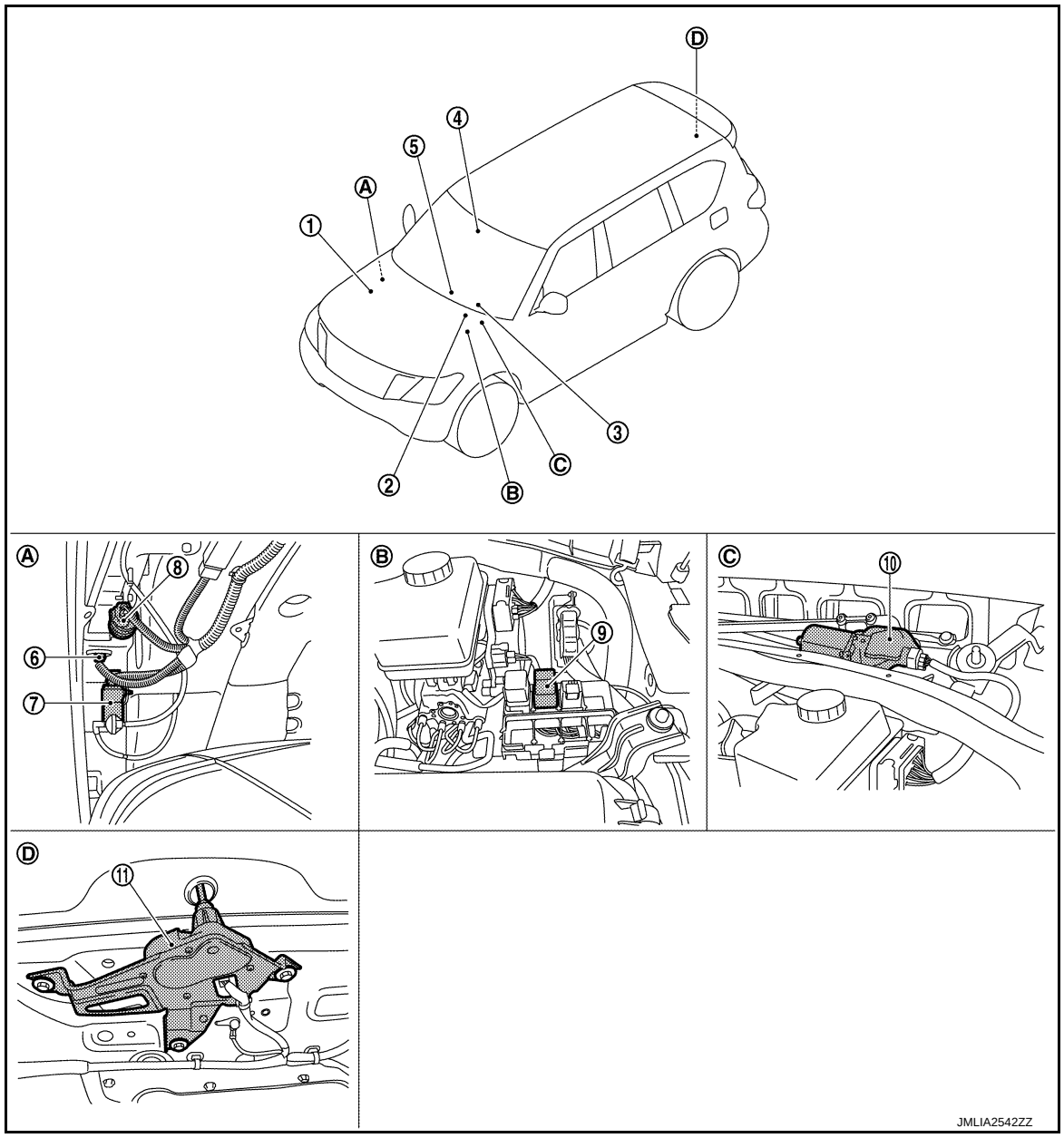
Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference.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

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000010260699



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

*:For models with headlamp washer

Component Description

INFOID:0000000010260700

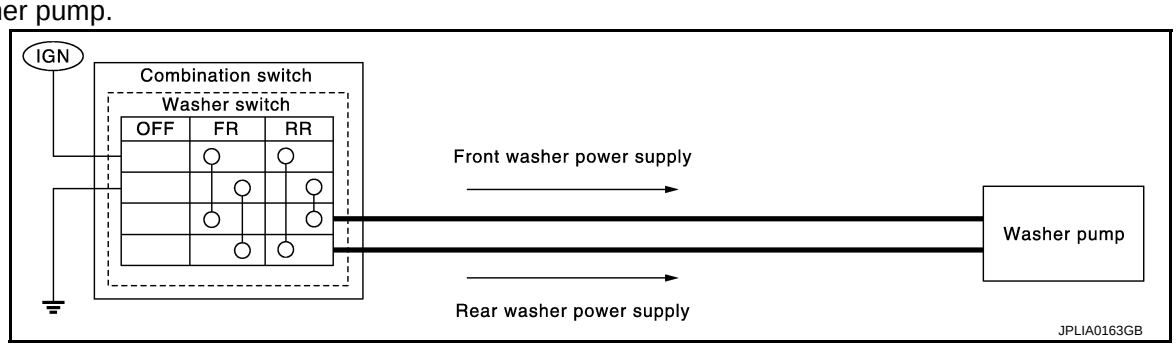
Part	Description
IPDM E/R	• Controls the integrated relay according to the request (via CAN communication) from BCM. • Performs the auto stop control of the front wiper.
BCM	• Judges each switch status by the combination switch reading function. • Requests (via CAN communication) the front wiper relay and the front wiper high relay ON to IPDM E/R. • Supplies power to the rear wiper motor. • Performs the auto stop control of the rear wiper. • Requests (via CAN communication) the headlamp washer relay ON to IPDM I/R.
Rain sensor	Detects water droplets on the windshield with infrared rays, and transmits the rain sensor signal to BCM via the rain sensor serial link.
Combination switch (Wiper & washer switch)	Refer to BCS-8, "COMBINATION SWITCH READING SYSTEM : System Description".
Washer switch	Refer to WW-6, "Washer Switch".
Washer pump	• Washer fluid is sprayed according to washer switch states. • Combination switch operates front washer or rear washer by changing voltage polarity to be supplied to washer pump.
Headlamp washer pump*	Washer fluid is sprayed according to washer switch states and headlamp switch status.
Front wiper motor	• IPDM E/R controls front wiper operation. • Front wiper stop position signal is transmitted to IPDM E/R.
Rear wiper motor	• BCM controls rear wiper operation. • Rear wiper stop position signal is transmitted to BCM.
Combination meter	Transmits the vehicle speed signal to BCM via CAN communication.

*:For models with headlamp washer

Washer Switch

INFOID:0000000010260701

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

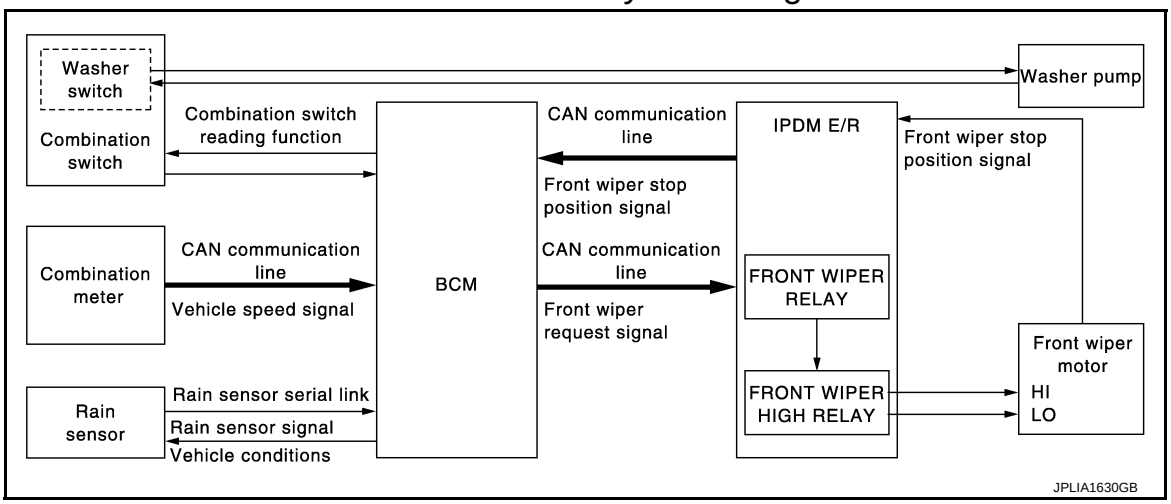


SYSTEM

FRONT WIPER AND WASHER SYSTEM

FRONT WIPER AND WASHER SYSTEM : System Diagram

INFOID:0000000010260702



FRONT WIPER AND WASHER SYSTEM : System Description

INFOID:0000000010260703

OUTLINE

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

Control by BCM
- Combination switch reading function
- Front wiper control function

Control by IPDM E/R
- Front wiper control function
- Relay control function

Combination meter indicates low washer fluid warning judged by the signal from the washer level switch. For details of low washer fluid warning, refer to MWI-16, "MASTER WARNING LAMP : System Description".

FRONT WIPER BASIC OPERATION

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

FRONT WIPER LO OPERATION

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

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

FRONT WIPER HI OPERATION

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

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

FRONT WIPER AUTO OPERATION

Rain Detection

Rain level and sensor conditions are detected by rain sensor.

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

Auto Wiping Operation

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

Front wiper AUTO operating condition

- Ignition switch ON
- Front wiper switch AUTO

NOTE:

- When the front wiper switch is turned to AUTO position, front wiper operates once regardless of rainy conditions.
- Factory setting of the front wiper AUTO operation is operation linked with rain sensor. Front wiper AUTO operation can be set to operation linked or not linked with rain sensor using CONSULT. Refer to WW-15, "WIPER : CONSULT Function (BCM - WIPER)".

Rain Sensor Sensitivity Setting

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

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

NOTE:

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

Splash mode operation

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

SPLASH MODE OPERATION CONDITIONS

- Front wiper switch AUTO
- Ignition switch ON

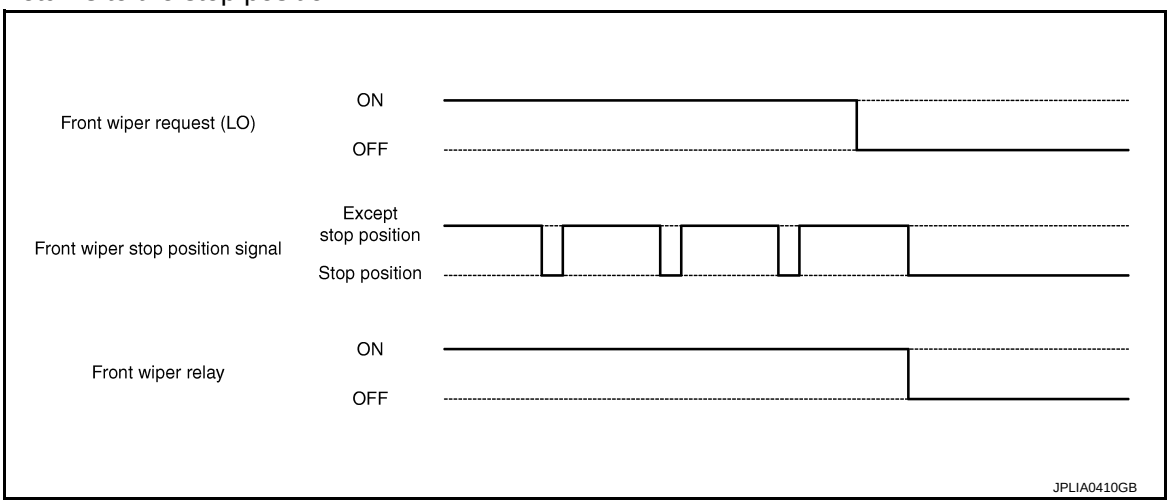
NOTE:

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

FRONT WIPER AUTO STOP OPERATION

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

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



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

FRONT WIPER OPERATION LINKED WITH WASHER

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

Washer linked operating condition of front wiper
- Ignition switch ON
- Front washer switch ON (0.4 second or more)

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

FRONT WIPER DROP WIPE OPERATION

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

Front wiper drop wipe operating condition
- Ignition switch ON
- Front wiper switch OFF
- Front washer switch OFF

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

NOTE:
Factory setting of the front wiper drop wipe operation is ON. Front wiper drop wipe operation can be set to ON or OFF using CONSULT. Refer to WW-15, "WIPER : CONSULT Function (BCM - WIPER)".

WIPER LINKED AUTO LIGHTING FUNCTION

When light switch is in the AUTO position, front wiper operates, and then headlamp illuminates. Refer to EXL-14, "AUTO LIGHT SYSTEM : System Description".

FRONT WIPER AND WASHER SYSTEM : Fail-safe

INFOID:0000000010260704

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 ignition switch is turned OFF while the front wiper is operating at LO or HI speed. • The wiper is operated at LO speed until the ignition switch is turned OFF if the fail-safe control is activated while the front wiper is set in the AUTO mode and the front wiper motor is operating. • Return automatically wiper to stop position when ignition switch is turned ON if fail-safe control is activated while front wiper motor is operated and wiper stops in the other position than stop position.

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.

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

NOTE:

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

BCM

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

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

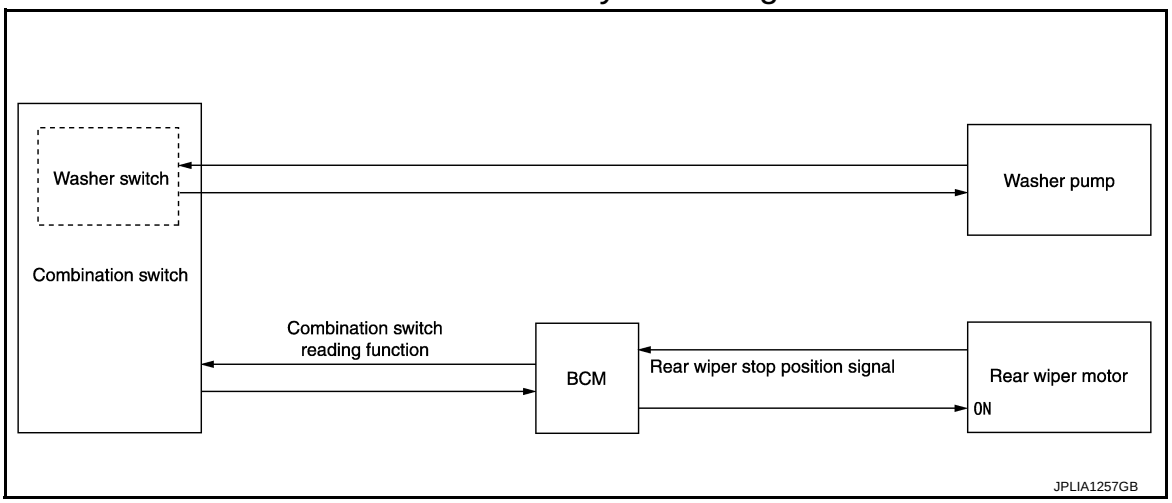
Fail-safe Control

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

REAR WIPER AND WASHER SYSTEM

REAR WIPER AND WASHER SYSTEM : System Diagram

INFOID:0000000010260705



REAR WIPER AND WASHER SYSTEM : System Description

INFOID:0000000010260706

OUTLINE

The rear wiper is controlled by each function of BCM.

Control by BCM
- Combination switch reading function
- Rear wiper control function

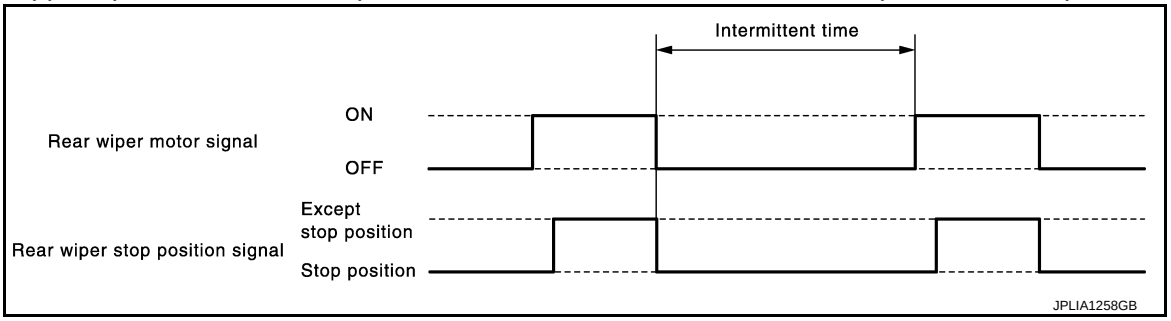
REAR WIPER BASIC OPERATION
- BCM detects the combination switch condition by the combination switch reading function.
- BCM controls the rear wiper to start or stop.

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

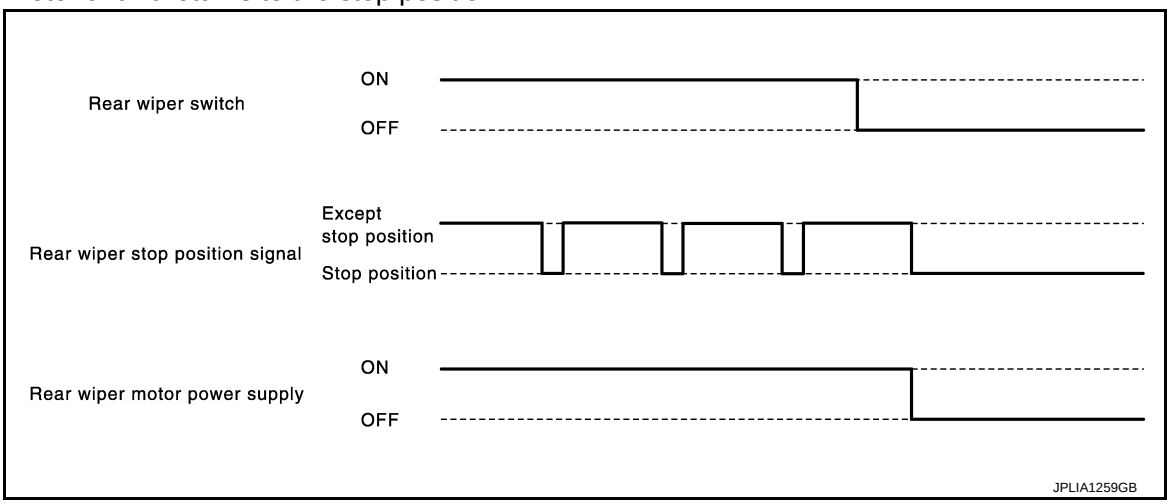
Rear wiper ON operating condition
- Ignition switch ON
- Rear wiper switch ON

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



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



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

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

Washer linked operating condition of rear wiper
- Ignition switch ON
- Rear washer switch ON (0.4 second or more)
- The washer pump is grounded through the combination switch with the rear washer switch ON.

REAR WIPER DROP WIPE OPERATION
- BCM controls the rear wiper to operate once according to the rear wiper drop wipe operating condition.

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

NOTE:
Factory setting of the rear wiper drop wipe operation is OFF. Rear wiper drop wipe operation can be set to ON or OFF using CONSULT. Refer to WW-15, "WIPER : CONSULT Function (BCM - WIPER)".

REAR WIPER AND WASHER SYSTEM : Fail Safe

INFOID:0000000010260707

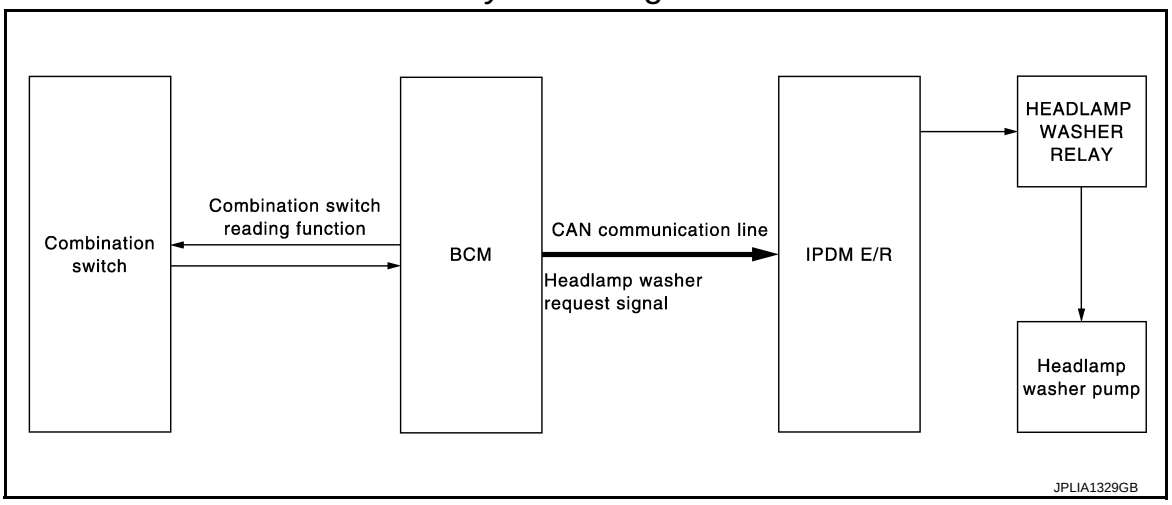
REAR WIPER MOTOR PROTECTION
BCM detects the rear wiper stop position according to the rear wiper stop position signal.
When the rear wiper stop position signal does not change for more than 5 seconds while driving the rear wiper, BCM stops power supply to protect the rear wiper motor.

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

HEADLAMP WASHER SYSTEM

HEADLAMP WASHER SYSTEM : System Diagram

INFOID:0000000010260708



HEADLAMP WASHER SYSTEM : System Description

INFOID:0000000010260709

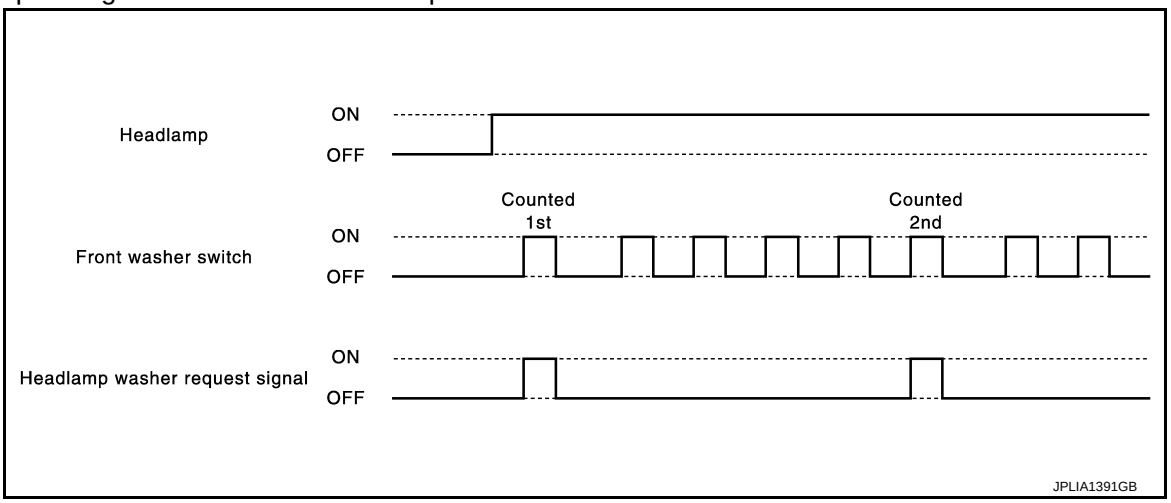
OUTLINE
Headlamp washer is controlled by each function of BCM and IPDM E/R.

Control by BCM
- Combination switch reading function
- Headlamp washer control function

Control by IPDM E/R
- Headlamp washer relay control function

HEADLAMP WASHER BASIC OPERATION

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



The operating condition to activate headlamp washer at first time
- Ignition switch ON
- Headlamps ON
- Front washer switch ON at first time

The operating condition to activate headlamp washer from the second time
- Ignition switch ON
- Headlamps ON
- Front washer switch ON at fifth time after the first time

- IPDM E/R turns ON/OFF the headlamp washer relay by receiving the headlamp washer request signal, and controls the headlamp washer.

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

INFOID:0000000011543268

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

Diagnosis mode	Function Description
Work Support	Changes the setting for each system function.
Self Diagnostic Result	Displays the diagnosis results judged by BCM. Refer to BCS-58, "DTC Index".
CAN Diag Support Monitor	Monitors the reception status of CAN communication viewed from BCM.
Data Monitor	The BCM input/output signals are displayed.
Active Test	The signals used to activate each device are forcibly supplied from BCM.
Ecu Identification	The BCM part number is displayed.
Configuration	• Read and save the vehicle specification. • Write the vehicle specification when replacing BCM.

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

×: Applicable item

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

*: This item is indicated, but not used.

FREEZE FRAME DATA (FFD)
The BCM records the following vehicle condition at the time a particular DTC is detected, and displays on CONSULT.

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

WIPER

WIPER : CONSULT Function (BCM - WIPER)

INFOID:0000000010260711

WORK SUPPORT

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

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

*:Factory setting

DATA MONITOR

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

Monitor Item [Unit]	Description
PUSH SW [Off/On]	The switch status input from push-button ignition switch.
VEH SPEED 1 [km/h]	Displays the value of the vehicle speed signal received from combination meter via CAN communication.
FR WIPER HI [Off/On]	Status of each switch judged by BCM using the combination switch reading function
FR WIPER LOW [Off/On]	
FR WASHER SW [Off/On]	
FR WIPER INT [Off/On]	
FR WIPER STOP [Off/On]	Displays the status of the front wiper stop position signal received from IPDM E/R via CAN communication.
INT VOLUME [1 – 7]	Status of each switch judged by BCM using the combination switch reading function
RR WIPER ON [Off/On]	Status of each switch judged by BCM using the combination switch reading function
RR WIPER INT [Off/On]	
RR WASHER SW [Off/On]	
RR WIPER STOP [Off/On]	Rear wiper motor (stop position) status input from the rear wiper motor
H/L WSR SW [Off/On]	**NOTE:** This item is indicated, but not monitored
RAIN SENSOR [OFF/LOW/HIGH/SPLASH/NG]	Request signal from rain sensor detected by BCM is displayed

ACTIVE TEST

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

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

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

DIAGNOSIS SYSTEM (IPDM E/R)

Diagnosis Description

INFOID:0000000011543269

AUTO ACTIVE TEST

Description

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

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

Operation Procedure

CAUTION:

Never perform auto active test in the following conditions.

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

1. Close the hood and lift the wiper arms from the windshield. (Prevent windshield damage due to wiper operation)
   NOTE:
   When auto active test is performed with hood opened, sprinkle water on windshield beforehand.
2. Turn the ignition switch OFF.
3. Turn the ignition switch ON, and within 20 seconds, press the driver door switch 10 times. Then turn the ignition switch OFF.
   CAUTION:
   Close passenger door.
4. Turn the ignition switch ON within 10 seconds. After that the horn sounds once and the auto active test starts.
   CAUTION:
   Engine starts when ignition switch is turned ON while brake pedal is depressed.
5. The oil pressure warning lamp starts blinking when the auto active test starts.
6. After a series of the following operations is repeated 3 times, auto active test is completed.

NOTE:

- When auto active test has to be cancelled halfway through test, turn the ignition switch OFF.
- When auto active test is not activated, door switch may be the cause. Check door switch. Refer to DLK-121, "Component Function Check".

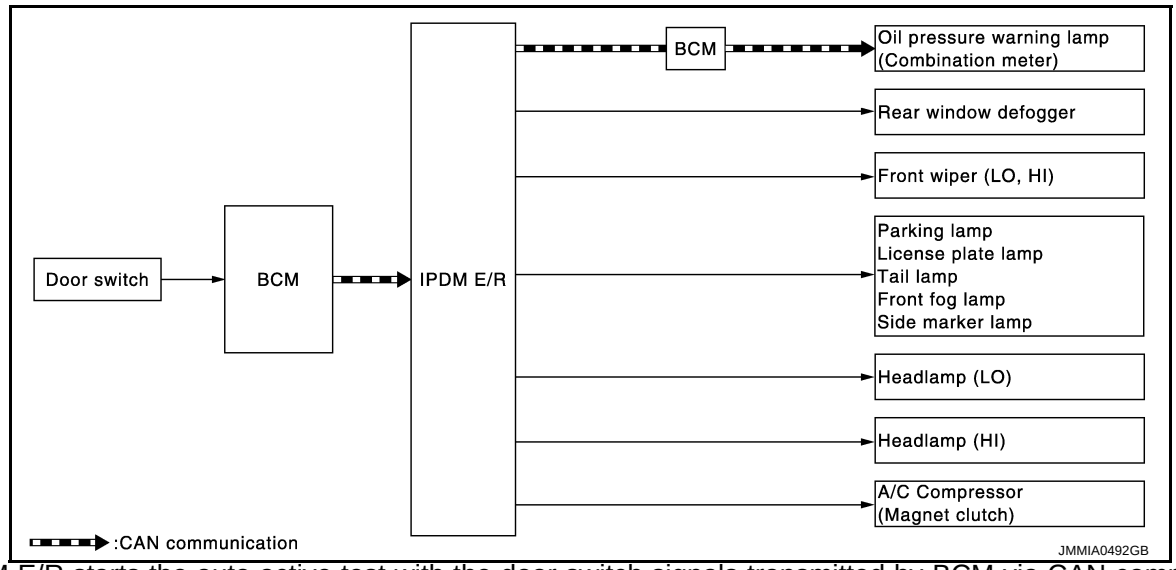
Inspection in Auto Active Test

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

Operation sequence	Inspection location	Operation
1	Oil pressure warning lamp	Blinks continuously during operation of auto active test
2	Rear window defogger	10 seconds
3	Front wiper	LO for 5 seconds → HI for 5 seconds
4	• Parking lamp • License plate lamp • Tail lamp • Side marker lamp • Front fog lamp	10 seconds

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

Concept of auto active test



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

Diagnosis chart in auto active test

Symptom	Inspection contents		Possible cause
Rear window defogger does not operate	Perform auto active test. Does the rear window defogger operate?	YES	BCM signal input circuit
		NO	• 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 • Side marker lamp • Front fog lamp • Headlamp (HI, LO) • Front wiper (HI, LO)	Perform auto active test. Does the applicable system operate?	YES	BCM signal input circuit
		NO	• Lamp or motor • Lamp or motor ground circuit • Harness or connector between IPDM E/R and applicable system • IPDM E/R
A/C compressor does not operate	Perform auto active test. Does the magnet clutch operate?	YES	• A/C auto amp. signal input circuit • CAN communication signal between A/C auto amp. and ECM • CAN communication signal between ECM and IPDM E/R
		NO	• Magnet clutch • Harness or connector between IPDM E/R and magnet clutch • IPDM E/R

Symptom	Inspection contents		Possible cause
Oil pressure warning lamp does not operate	Perform auto active test. Does the oil pressure warning lamp blink?	YES	• Harness or connector between IPDM E/R and oil pressure switch • Oil pressure switch • IPDM E/R
		NO	• CAN communication signal between IPDM E/R and BCM • CAN communication signal between BCM and combination meter • Combination meter

CONSULT Function (IPDM E/R)

INFOID:0000000011543270

APPLICATION ITEM

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

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

SELF DIAGNOSTIC RESULT

Refer to PCS-22, "DTC Index".

DATA MONITOR

NOTE:

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

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

Monitor Item [Unit]	MAIN SIGNALS	Description
IGN RLY [Off/On]	×	Displays the status of the ignition relay judged by IPDM E/R.
PUSH SW [Off/On]		Displays the status of the push-button ignition switch judged by IPDM E/R.
INTER/NP SW [Off/On]		Displays the status of the shift position judged by IPDM E/R.
ST RLY CONT [Off/On]		Displays the status of the starter relay status signal received from BCM via CAN communication.
IHBT RLY -REQ [Off/On]		Displays the status of the starter control relay signal received from BCM via CAN communication.
ST/INHI RLY [Off/ ST ON/INHI ON/UNKWN]		Displays the status of the starter relay and starter control relay judged by IPDM E/R.
DETENT SW [Off/On]		Displays the status of the A/T shift selector (detention switch) judged by IPDM E/R.
S/L RLY -REQ [Off/On]		**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 day time running light request signal received from BCM via CAN communication
OIL P SW [Open/Close]		Displays the status of the oil pressure switch judged by IPDM E/R.
HOOD SW [Off/On]		Displays the status of the hood switch 1 judged by IPDM E/R.
HL WASHER REQ [Off/On]		Displays the status of the headlamp washer request signal received from BCM via CAN communication.
THFT HRN REQ [Off/On]		Displays the status of the theft warning horn request signal received from BCM via CAN communication.
HORN CHIRP [Off/On]		Displays the status of the horn reminder signal received from BCM via CAN communication.
HOOD SW 2 [Off/On]		Displays the status of the hood switch 2 judged by IPDM E/R.

ACTIVE TEST

Test item	Operation	Description
CORNERING LAMP	LH	**NOTE:** This item is indicated, but cannot be tested.
	RH	
HORN	On	Operates horn relay for 20 ms.
REAR DEFOGGER	Off	OFF
	On	Operates the rear window defogger relay.
FRONT WIPER	Off	OFF
	Lo	Operates the front wiper relay.
	Hi	Operates the front wiper relay and front wiper high relay.
MOTOR FAN*	1	OFF
	2	Transmits 50% pulse duty signal (PWM signal) to the cooling fan control module.
	3	Transmits 75% pulse duty signal (PWM signal) to the cooling fan control module.
	4	Transmits 100% pulse duty signal (PWM signal) to the cooling fan control module.
HEAD LAMP WASHER	On	Operates the headlamp washer relay for 1 second.

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

*: Operates while the engine is running.

ECU DIAGNOSIS INFORMATION

BCM, IPDM E/R

List of ECU Reference

INFOID:0000000010260714

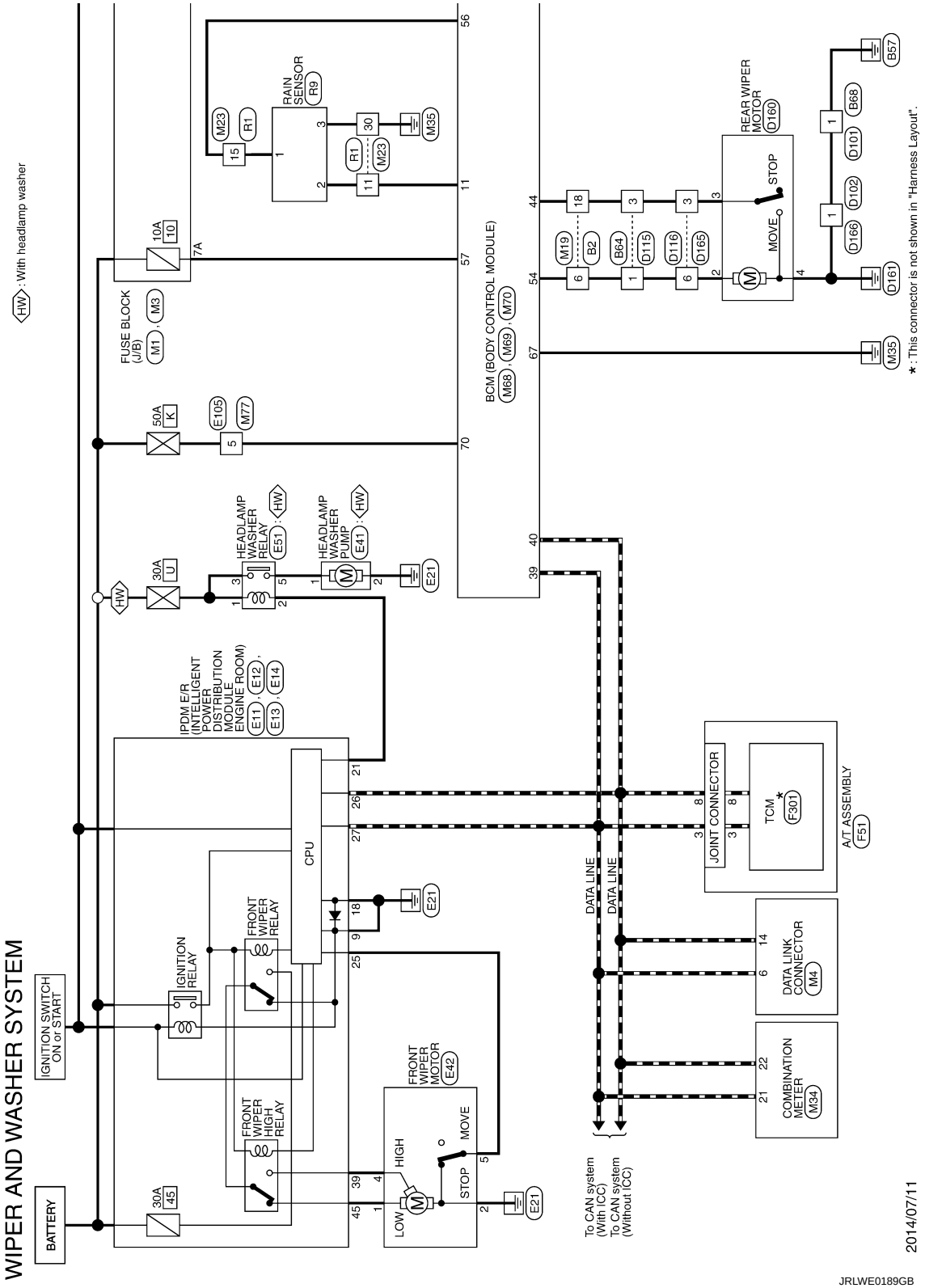
ECU	Reference
BCM	BCS-35, "Reference Value"
	BCS-56, "Fail-safe"
	BCS-57, "DTC Inspection Priority Chart"
	BCS-58, "DTC Index"
IPDM E/R	PCS-15, "Reference Value"
	PCS-21, "Fail-safe"
	PCS-22, "DTC Index"

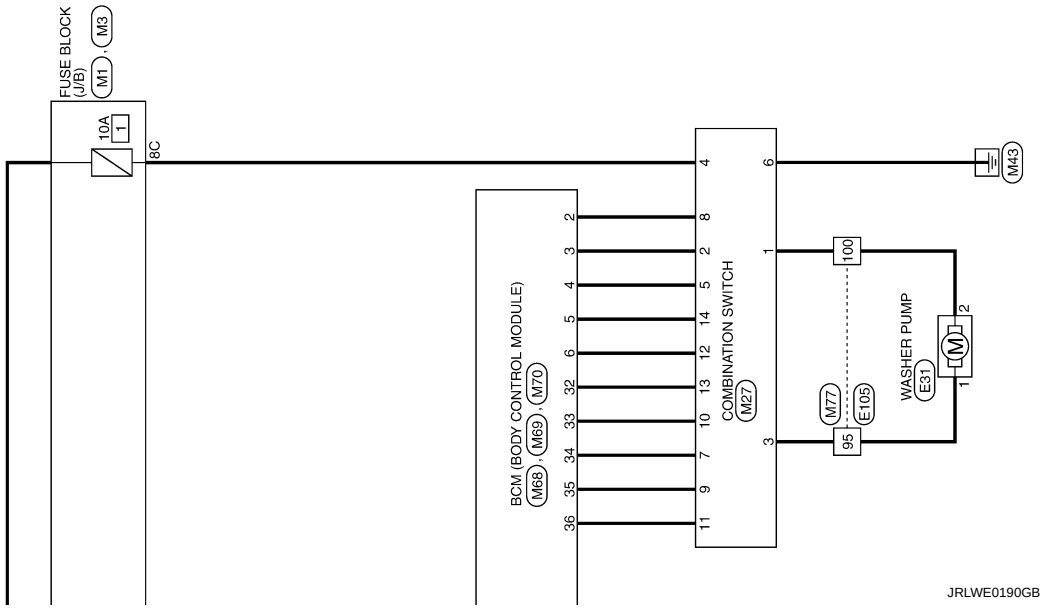
WIRING DIAGRAM

WIPER AND WASHER SYSTEM

Wiring Diagram

INFOID:0000000010260715




FUSE BLOCK (J/B)
M1
M3
10A
1
8C
BCM (BODY CONTROL MODULE)
M68
M69
M70
2
3
4
5
6
32
33
34
35
36
COMBINATION SWITCH
M27
4
8
2
5
14
12
13
10
7
9
11
6
1
3
M43
100
95
M77
E105
WASHER PUMP
E31
M1
2
1
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WIPER AND WASHER SYSTEM

Connector No.	B2
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
2	L	–
3	BR	–
5	R/W	–
6	L	–
7	V	–
9	G	–
11	W/B	–
12	BR	–
13	G/R	–
14	B/Y	–
15	W/R	–
16	GR/R	–
18	G/W	–
19	V	–
20	W/G	–
21	B/W	–
22	V	–
24	G	–
25	O	–
26	Y	–
27	L/O	–
28	Y/R	–
29	L	–
30	R	–
31	G/Y	–
32	B/SB	–
33	LG/R	–
34	BR/W	–
35	GR/R	–
36	SB	–
37	LG	–
38	L	–
39	P	–
40	W/G	–
41	O	–
43	V/W	–
44	LG/B	–
46	B	–
47	BR	–
49	GR	–
50	R/B	–
51	W/R	–
52	BR/Y	–
53	O/B	–
54	G/O	–
55	R/B	–
56	LG/R	–
57	GR/R	–
58	Y/G	–
59	V/W	–
60	R	–
63	B	–
64	R	–
65	W	–
66	G	–
67	SHIELD	–
69	LG/B	–
70	P/L	–
71	L	–
72	R	–
77	Y/B	–
78	Y/L	–
79	Y	–
80	W/R	–
81	Y/L	–
84	L/O	–
86	O	–
87	W/R	–
88	O	–
89	W/L	–
90	GR/L	–
91	W	–
92	G	–
94	W/R	–
96	L/W	–
97	R	–
98	V	–
99	L/W	–
100	P/B	–

Connector No.	B64
Connector Name	WIRE TO WIRE
Connector Type	NS08MW-CS

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	–
2	R/Y	–
3	G/W	–
4	R	–
5	R	–
7	L/W	–
8	V	–

Connector No.	B68
Connector Name	WIRE TO WIRE
Connector Type	M02MW-LC

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	–
2	R	–

Connector No.	D101
Connector Name	WIRE TO WIRE
Connector Type	M02FW-LC

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	–
2	L	–

Connector No.	D102
Connector Name	WIRE TO WIRE
Connector Type	M01FBR-S-LC

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	–

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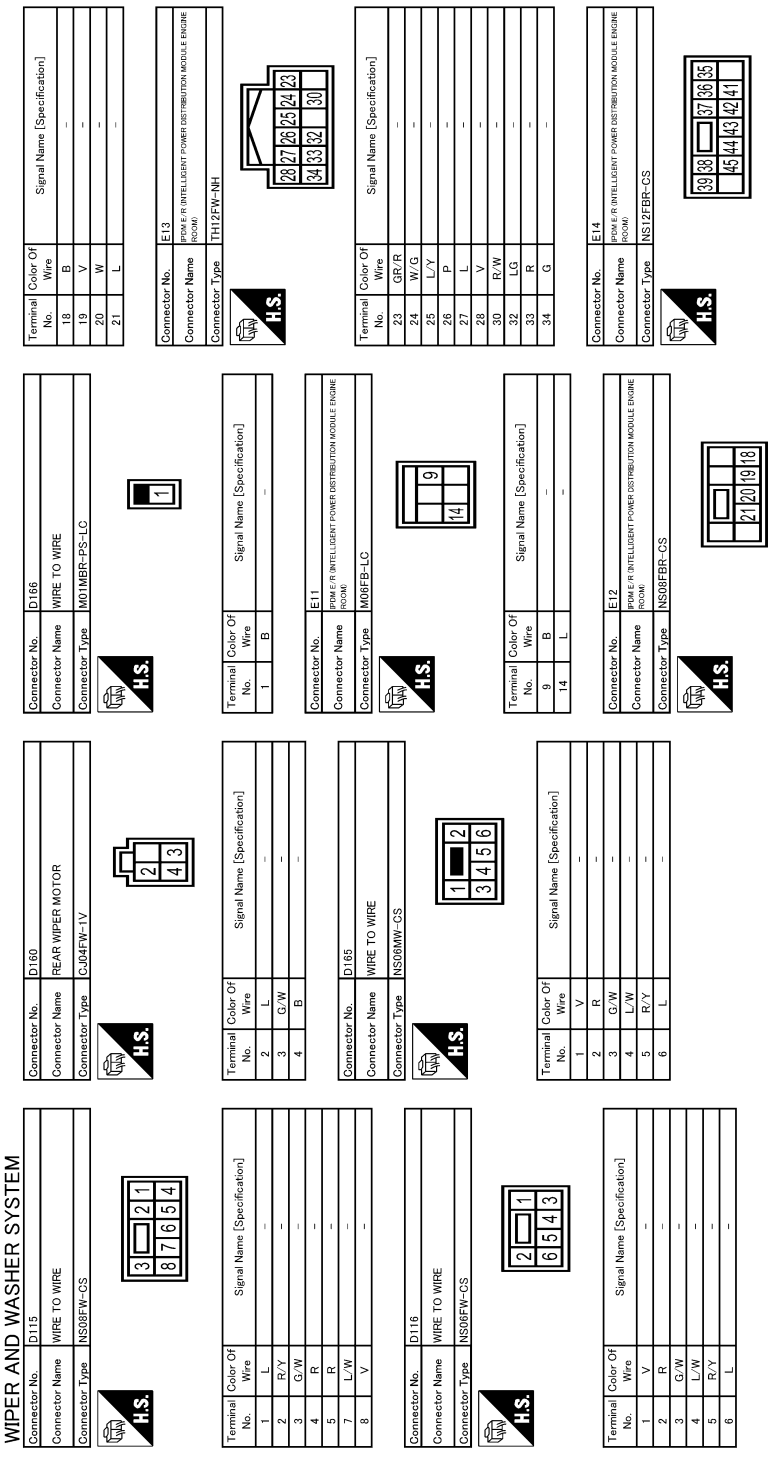

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WIPER AND WASHER SYSTEM

Terminal No.	Color Of Wire	Signal Name [Specification]
35	W	–
36	V	–
37	L	–
38	Y	–
39	L/B	–
41	L/G	–
42	L	–
43	LG	–
44	L/W	–
45	Y/R	–

Connector No.	E31
Connector Name	WASHER PUMP
Connector Type	E02FGY-RS

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	G/R	–
2	W/R	–

Connector No.	E41
Connector Name	HEADLAMP WASHER PUMP
Connector Type	SJZ02FB

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	GR	–
2	B	–

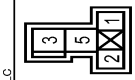
Connector No.	E42
Connector Name	FRONT WIPER MOTOR
Connector Type	HS05FGY

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	Y/R	–
2	B	–
4	L/B	–
5	L/Y	–

Connector No.	E51
Connector Name	HEADLAMP WASHER RELAY
Connector Type	MS02FL-M2-LC

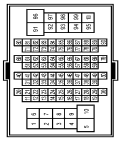
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	G	–
2	L	–
3	G	–
5	GR	–

Connector No.	E105
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	–
2	L/W	–
3	R/B	–
4	L	–
5	Y	–
7	W/G	–
8	P/B	–
9	W/B	–
10	G	–
11	L	–
12	P	–
13	P/B	–
14	BR	–
15	L/B	–
16	SB	–
18	BR	–
19	Y/G	–
20	BR/Y	–
21	Y/V	–
22	L	–
23	Y	–
24	L/W	–
28	O	–
29	R/W	–
30	L/B	–
31	Y	–
32	GR/R	–
34	Y	–
35	R	–
36	B/R	–
37	G/Y	–
38	G	–
40	SB	–
41	W/R	–
42	R	–
43	V	–

54	GR/L	–
91	BR	–
92	L/W	–
94	Y/B	–
95	G/R	–
97	R	–
98	G/B	–
100	W/R	–

Connector No.	F51
Connector Name	A/T ASSEMBLY
Connector Type	RK10FG

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	V	IGNITION POWER SUPPLY
2	P	BATTERY POWER SUPPLY
3	L	CAN-H
4	SB	K-LINE
5	B	GROUND
6	V	IGNITION POWER SUPPLY
7	R	BACK-UP LAMP RELAY
8	P	CAN-L
9	BR	STARTER RELAY
10	B	GROUND

JRLWE0193GB

WIPER AND WASHER SYSTEM

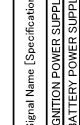
Connector No.	F301
Connector Name	TCM
Connector Type	SP10FG

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	–	IGNITION POWER SUPPLY
2	–	BATTERY POWER SUPPLY
3	–	CAN-H
4	–	K-LINE
5	–	GROUND
6	–	IGNITION POWER SUPPLY
7	–	BACK-UP LAMP RELAY
8	–	CAN-L
9	–	STARTER RELAY
10	–	GROUND

Connector No.	M1
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS06FW-M2

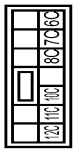
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1A	Y	–
2A	GR	–
3A	W	–
4A	Y/G	–
5A	V	–
6A	L/W	–
7A	LG	–
8A	W	–

Connector No.	M3
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS12FW-CS

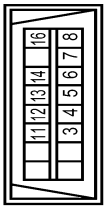
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
10C	GR	–
11C	R/L	–
12C	GR/L	–
6C	R	–
7C	B	–
8C	W	–

Connector No.	M4
Connector Name	DATA LINK CONNECTOR
Connector Type	BD16FW

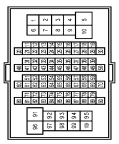
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
3	LG	–
4	B	–
5	B	–
6	L	–
7	SB	–
8	GR	–
11	SB	–
12	R	–
13	L	–
14	P	–
16	Y	–

Connector No.	M19
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
2	L	–
3	BR	–
5	R/W	–
6	L	–
7	V	–
9	G	–
11	W/B	–
12	BR	–
13	G/R	–
14	B/Y	–
15	W/R	–
16	GR/R	–
18	G/W	–
19	V	–
20	W/G	–
21	B/W	–
22	V	–
24	G	–
25	O	–
26	Y	–
27	L	–
28	Y	–
29	L	–
30	R	–
31	G/Y	–
32	B/SB	–
33	LG/R	–
34	BR/W	–
35	GR/R	–
36	SB	–
37	LG	–
38	L	–
39	P	–
40	W/G	–
41	O	–
43	V/W	–
44	LG/B	–
46	B	–
47	BR/W	–
49	GR	–
50	R/B	–
51	W/R	–
52	BR/Y	–
53	O/B	–
54	G/O	–
55	R/B	–
56	LG/R	–
57	GR/R	–
58	Y/G	–
59	V/W	–
60	R	–
63	B	–
64	R	–
65	W	–
66	G	–
67	SHIELD	–
69	LG/B	–
70	P/L	–
71	L	–
72	R	–
77	Y/B	–
78	Y/L	–
79	Y	–
80	W/R	–
81	Y/L	–
84	L/O	–
86	O	–
87	W/R	–
88	O	–
89	W/L	–
90	GR/L	–
91	W	–
92	G	–
94	W/R	–
96	L/W	–
97	R	–
98	V	–
99	L/W	–
100	P/B	–

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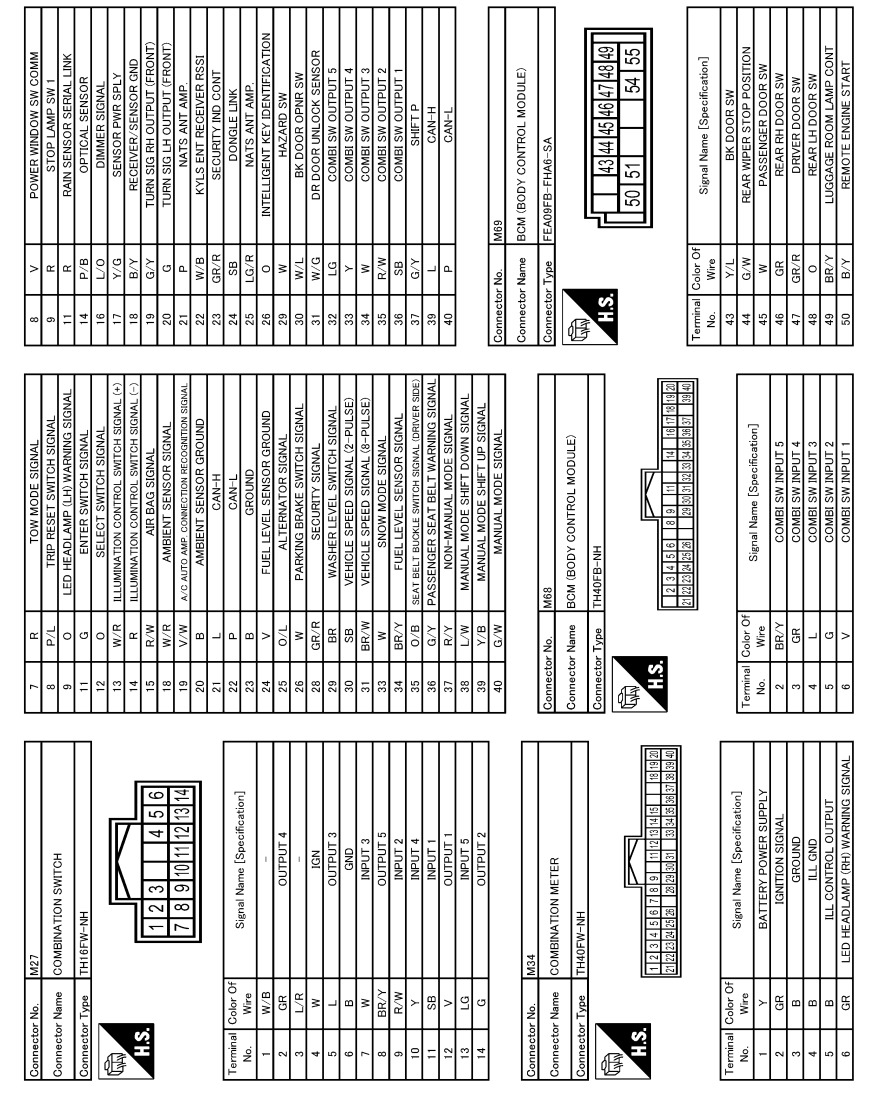

JRLWE0195GB

WIPER AND WASHER SYSTEM

51	W/R	BACK DOOR REQ SW
54	L	REAR WIPER OUTPUT
55	G	REAR DOOR UNLK OUTPUT

Connector No.	M70
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	FE40FW-FHA6-SA

H.S.

56	57	58	59	60	61	62	63	64
65	66	67	68	69	70			

Terminal No.	Color Of Wire	Signal Name [Specification]
56	W/R	INT ROOM LAMP PWR SPLY
57	LG	BAT (FUSE)
58	R/W	SHOCK DETECT SENS
59	G	PASSENGER DOOR UNLK OUTPUT
60	G	TURN SIG LH OUTPUT (SIDE, REAR)
61	G/Y	TURN SIG RH OUTPUT (SIDE, REAR)
62	R	STEP LAMP CONT
63	BR	ROOM LAMP TIMER CONT
64	GR/R	CRANKING REQUEST
65	R	ALL DOOR LOCK OUTPUT
66	V	DR DOOR, FUEL LID UNLK OUTPUT
67	B	GND
68	Y	PW PWR SPLY (IGN)
69	W	PW PWR SPLY (BAT)
70	Y	BAT (F/L)

Connector No.	M77
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4

H.S.

96	97	98	99	100
91	92	93	94	95
86	87	88	89	90
81	82	83	84	85
76	77	78	79	80
71	72	73	74	75

Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	–
2	L/W	–
3	R/B	–
4	L	–
5	Y	–
7	W/G	–
8	P/B	–
9	W/B	–
10	G	–
11	L	–
12	P	–
13	P/B	–
14	BR	–
15	O/L	–
16	SB	–
18	BR	–
19	Y/G	–
20	BR/Y	–
21	V	–
22	L	–
23	Y	–
24	L/W	–
28	O	–
29	R/W	–
30	O/L	–
31	Y	–
32	GR/R	–
34	Y	–
35	R	–
36	B/O	–
37	G/Y	–
38	G	–
40	SB	–
41	W/R	–
42	R	–
43	V	–

54	GR/L
91	BR
92	L/W
94	Y/B
95	L/R
97	R
98	O/L
100	W/B

Connector No.	R1
Connector Name	WIRE TO WIRE
Connector Type	TH32FW-NH

H.S.

16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17

Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	–
2	V	–
3	B	–
4	Y	–
5	B/R	–
6	B/Y	–
7	B	–
8	Y/L	–
9	G	–
10	B	–
11	R	–
14	B/Y	–
15	W/R	–
16	L/O	–
17	Y	–
18	L/O	–
20	W	–
21	O	–
22	SB	–
23	B	–
24	SHIELD	–
25	Y/G	–
26	B/SB	–
27	W/G	–
28	Y	–
29	L	–

30	B/SB
31	BR
32	B/R

Connector No.	R9
Connector Name	RAIN SENSOR
Connector Type	AAB03FB

H.S.

1	2	3

Terminal No.	Color Of Wire	Signal Name [Specification]
1	W/R	–
2	R	–
3	B	–

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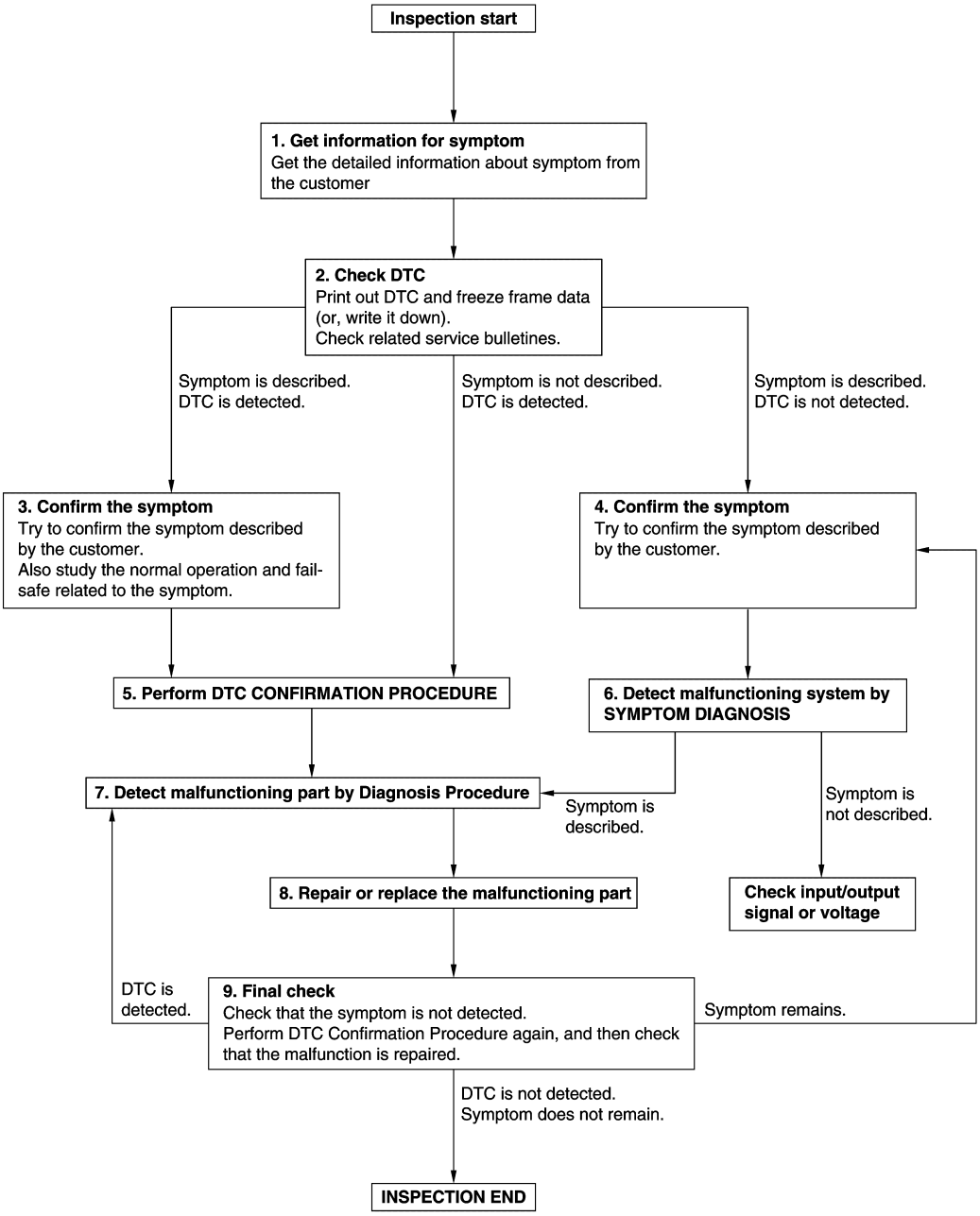
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000010260716

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 DTC INSPECTION PRIORITY CHART, and determine trouble diagnosis order.

NOTE:

- Freeze frame data is useful if the DTC is not detected.
- Perform Component Function Check if DTC CONFIRMATION PROCEDURE is not included on Service Manual. This simplified check procedure is an effective alternative though DTC cannot be detected during this check.
  If the result of Component Function Check is NG, it is the same as the detection of DTC by DTC CONFIRMATION PROCEDURE.

Is DTC detected?

YES >> GO TO 7.
NO >> Check according to GI-43, "Intermittent Incident".

6.DETECT MALFUNCTIONING SYSTEM BY SYMPTOM DIAGNOSIS

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

Is the symptom described?

YES >> GO TO 7.
NO >> Monitor input data from related sensors or check voltage of related module terminals using CONSULT.

7.DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

Inspect according to Diagnosis Procedure of the system.

Is malfunctioning part detected?

YES >> GO TO 8.
NO >> Check according to GI-43, "Intermittent Incident".

8. REPAIR OR REPLACE THE MALFUNCTIONING PART

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

>> GO TO 9.

9. FINAL CHECK

When DTC is detected in step 2, perform DTC CONFIRMATION PROCEDURE again, and then check that the malfunction is repaired securely.
When symptom is described by the customer, refer to confirmed symptom in step 3 or 4, and check that the symptom is not detected.

Is DTC detected and does symptom remain?

YES-1 >> DTC is detected: GO TO 7.
YES-2 >> Symptom remains: GO TO 4.
NO >> Before returning the vehicle to the customer, always erase DTC.

DTC/CIRCUIT DIAGNOSIS

FRONT WIPER MOTOR LO CIRCUIT

Component Function Check

INFOID:0000000010260717

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-35, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000010260718

1.CHECK FRONT WIPER MOTOR (LO) OUTPUT VOLTAGE

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

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

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

Is the inspection result normal?

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

2.CHECK FRONT WIPER MOTOR (LO) CIRCUIT

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

IPDM E/R		Front wiper motor		Continuity
Connector	Terminal	Connector	Terminal	
E14	45	E42	1	Existed

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

IPDM E/R		Ground	Continuity
Connector	Terminal		
E14	45		Not existed

Is the inspection result normal?

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

FRONT WIPER MOTOR HI CIRCUIT

Component Function Check

INFOID:0000000010260719

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-36, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000010260720

1.CHECK FRONT WIPER MOTOR (HI) OUTPUT VOLTAGE

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

(+)		(–)	Condition		Voltage (Approx.)
Front wiper motor					
Connector	Terminal				
E42	4	Ground	FRONT WIPER	Hi	Battery voltage (10 seconds)*

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

Is the inspection result normal?

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

2.CHECK FRONT WIPER MOTOR (HI) CIRCUIT

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

IPDM E/R		Front wiper motor		Continuity
Connector	Terminal	Connector	Terminal	
E14	39	E42	4	Existed

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

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

Is the inspection result normal?

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

FRONT WIPER STOP POSITION SIGNAL CIRCUIT

Component Function Check

INFOID:0000000010260721

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-37, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000010260722

1.CHECK IPDM E/R OUTPUT VOLTAGE

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

(+)		(–)	Voltage (Approx.)
Front wiper motor			
Connector	Terminal		
E42	5	Ground	12 V

Is the inspection result normal?

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

2.CHECK FRONT WIPER STOP POSITION SIGNAL CIRCUIT

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

IPDM E/R		Front wiper motor		Continuity
Connector	Terminal	Connector	Terminal	
E13	25	E42	5	Existed

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

IPDM E/R		Ground	Continuity
Connector	Terminal		
E13	25		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:0000000010260723

1.CHECK FRONT WIPER MOTOR GROUND CIRCUIT

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

Front wiper motor		Ground	Continuity
Connector	Terminal		
E42	2		Existed

Is the inspection result normal?

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

RAIN SENSOR

Component Function Check

INFOID:0000000010260724

1.CHECK FRONT WIPER AUTO OPERATION

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

Is front wiper (AUTO) operation normally?

YES >> Rain sensor circuit is normal.
NO >> Refer to WW-39, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000010260725

1.CHECK RAIN SENSOR FUSE

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

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

Is the inspection result normal?

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

2.CHECK RAIN SENSOR POWER SUPPLY

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

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

Is the inspection result normal?

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

3.CHECK RAIN SENSOR GROUND CIRCUIT

Check continuity between rain sensor harness connector and ground.

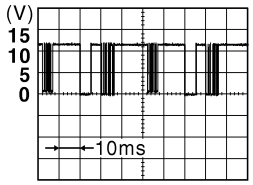
Rain sensor		Ground	Continuity
Connector	Terminal		
R9	3		Existed

Is the inspection result normal?

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

4.CHECK RAIN SENSOR SIGNAL

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

(+)		(–)	Condition	Signal (Reference value)
BCM				
Connector	Terminal			
M68	11	Ground	Ignition switch ON	 JPMIA0156GB Approx. 8.7V

Is the inspection result normal?

YES >> Replace rain sensor.
NO >> GO TO 5.

5.CHECK RAIN SENSOR SIGNAL CIRCUIT FOR OPEN

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

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

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace harness.

6.CHECK RAIN SENSOR SIGNAL CIRCUIT FOR SHORT

Check continuity between BCM harness connector and ground.

BCM		Ground	Continuity
Connector	Terminal		
M68	11		Not existed

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-95, "Removal and Installation".
NO >> Repair or replace harness.

WASHER SWITCH

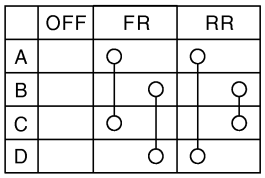
Component Inspection

INFOID:0000000010260726

1.CHECK WASHER SWITCH

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

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



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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.

REAR WIPER MOTOR CIRCUIT

Component Function Check

INFOID:0000000010260727

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-42, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000010260728

1.CHECK REAR WIPER MOTOR OUTPUT VOLTAGE

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

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

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

Is the inspection result normal?

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

2.CHECK REAR WIPER MOTOR CIRCUIT

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

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

4. Check continuity between BCM harness connector and ground.

BCM		Ground	Continuity
Connector	Terminal		
M69	54		Not existed

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-95, "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		
D160	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:0000000010260729

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-44, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000010260730

1.CHECK BCM OUTPUT VOLTAGE

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

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

Is the inspection result normal?

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

2.CHECK REAR WIPER STOP POSITION SIGNAL CIRCUIT

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

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

4. Check continuity between BCM harness connector and ground.

BCM		Ground	Continuity
Connector	Terminal		
M69	44		Not existed

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-95, "Removal and Installation".
NO >> Repair or replace harness.

HEADLAMP WASHER CIRCUIT

Component Function Check

INFOID:0000000010260731

1.CHECK HEADLAMP WASHER OPERATION

CONSULT ACTIVE TEST
1. Select “HEAD LAMP WASHER” of IPDM E/R active test item.
2. With operating the test item, check headlamp operation.

On :Headlamp washer ON operation
Off :Stop the headlamp washer.

Is headlamp washer operation normally?

YES >> Headlamp washer circuit is normal.
NO >> Refer to WW-45, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000010260732

1.CHECK HEADLAMP WASHER FUSIBLE LINK

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

Unit	Fusible link No.	Capacity
Headlamp washer	U	30 A

Is the inspection result normal?

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

2.CHECK HEADLAMP WASHER RELAY POWER SUPPLY

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

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

Is the inspection result normal?

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

3.CHECK HEADLAMP WASHER RELAY

Check headlamp washer relay. Refer to WW-47, "Component Inspection".

Is the headlamp washer relay normal?

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

4.CHECK HEADLAMP WASHER RELAY CONTROL SIGNAL

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

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

Is the inspection result normal?

YES >> GO TO 7.
Fixed at 0 V >> GO TO 5.
Fixed at 12 V>>Replace IPDM E/R.

5.CHECK HEADLAMP WASHER RELAY CONTROL SIGNAL OPEN CIRCUIT

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

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

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace harness.

6.CHECK HEADLAMP WASHER RELAY CONTROL SIGNAL SHORT CIRCUIT

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

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

Is the inspection result normal?

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

7.CHECK HEADLAMP WASHER PUMP OPEN CIRCUIT

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

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

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair or replace harness.

8.CHECK HEADLAMP WASHER PUMP (GND) OPEN CIRCUIT

Check continuity headlamp washer pump harness connector and ground.

Headlamp washer pump		Ground	Continuity
Connector	Terminal		
E41	2		Existed

Is the inspection result normal?

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

Component Inspection

INFOID:0000000010260733

1. CHECK HEADLAMP WASHER RELAY

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

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

Is the inspection result normal?

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

SYMPTOM DIAGNOSIS

WIPER AND WASHER SYSTEM SYMPTOMS

Symptom Table

INFOID:0000000010260734

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-93, "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-36, "Component Function Check"
		Front wiper request signal • BCM • IPDM E/R	IPDM E/R DATA MONITOR “FR WIP REQ”
	LO only	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-93, "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-35, "Component Function Check"
		Front wiper request signal • BCM • IPDM E/R	IPDM E/R DATA MONITOR “FR WIP REQ”
	AUTO only	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-93, "Symptom Table"
		• Rain sensor • Harness between rain sensor and BCM • BCM	Rain sensor Refer to WW-39, "Component Function Check"
	HI, LO and AUTO	SYMPTOM DIAGNOSIS “FRONT WIPER DOES NOT OPERATE” Refer to WW-52, "Diagnosis Procedure"	
Front wiper does not stop	HI only	• Combination switch • BCM	Combination switch Refer to BCS-93, "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-93, "Symptom Table"
		Front wiper request signal • BCM • IPDM E/R	IPDM E/R DATA MONITOR “FR WIP REQ”
		IPDM E/R	—
	AUTO only	• Combination switch • BCM	Combination switch Refer to BCS-93, "Symptom Table"
		• Rain sensor • Harness between rain sensor and BCM • BCM	Rain sensor Refer to WW-39, "Component Function Check"

Symptom		Probable malfunction location	Inspection item
Front wiper does not operate normally	Sensitivity adjustment cannot be performed.	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer toBCS-93, "Symptom Table"
		BCM	—
	Auto wiping operation does not operate	Check that the wiper setting is auto wiping operation Refer to WW-15, "WIPER : CONSULT Function (BCM - WIPER)"	
	Wiper is not linked to the washer operation.	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-93, "Symptom Table"
		BCM	—
	Does not return to stop position. [Repeatedly operates for 10 seconds and then stops for 20 seconds. (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-37, "Component Function Check"
Rear wiper does not operate	ON only	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-93, "Symptom Table"
	INT only	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-93, "Symptom Table"
	ON and INT	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-93, "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-42, "Component Function Check"
Rear wiper does not stop	ON only	• Combination switch • BCM	Combination switch Refer to BCS-93, "Symptom Table"
	INT only	• Combination switch • BCM	Combination switch Refer to BCS-93, "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-93, "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-44, "Component Function Check"

Symptom		Probable malfunction location	Inspection item
Headlamp washer does not operate.	Headlamp washer does not operate with the front washer when headlamps are turned ON.	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-93, "Symptom Table"
		• Fusible link • Harness between fusible link and headlamp washer relay • Headlamp washer relay • Harness between headlamp washer relay and IPDM E/R • IPDM E/R • Harness between headlamp washer relay and headlamp washer pump • headlamp washer pump • Harness between headlamp washer pump and ground	Headlamp washer circuit Refer to WW-45, "Component Function Check"
		BCM	—

NORMAL OPERATING CONDITION

Description

INFOID:0000000010260735

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:0000000010260736

The front wiper does not operate under any operation conditions.

Diagnosis Procedure

INFOID:0000000010260737

1.CHECK WIPER RELAY OPERATION

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

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

Is front wiper operation normally?

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

2.CHECK FRONT WIPER MOTOR FUSE

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

Unit	Location	No.	Capacity
Front wiper motor	IPDM E/R	45	30 A

Is the inspection result normal?

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

3.CHECK FRONT WIPER MOTOR GROUND CIRCUIT

Check front wiper motor ground circuit. Refer to WW-38, "Diagnosis Procedure".

Is the inspection result normal?

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

4.CHECK FRONT WIPER REQUEST SIGNAL INPUT

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

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

Is the inspection result normal?

YES >> Replace IPDM E/R.
NO >> GO TO 5.

5.CHECK COMBINATION SWITCH

Perform the inspection of the combination switch. Refer to BCS-93, "Symptom Table".

Is combination switch normal?

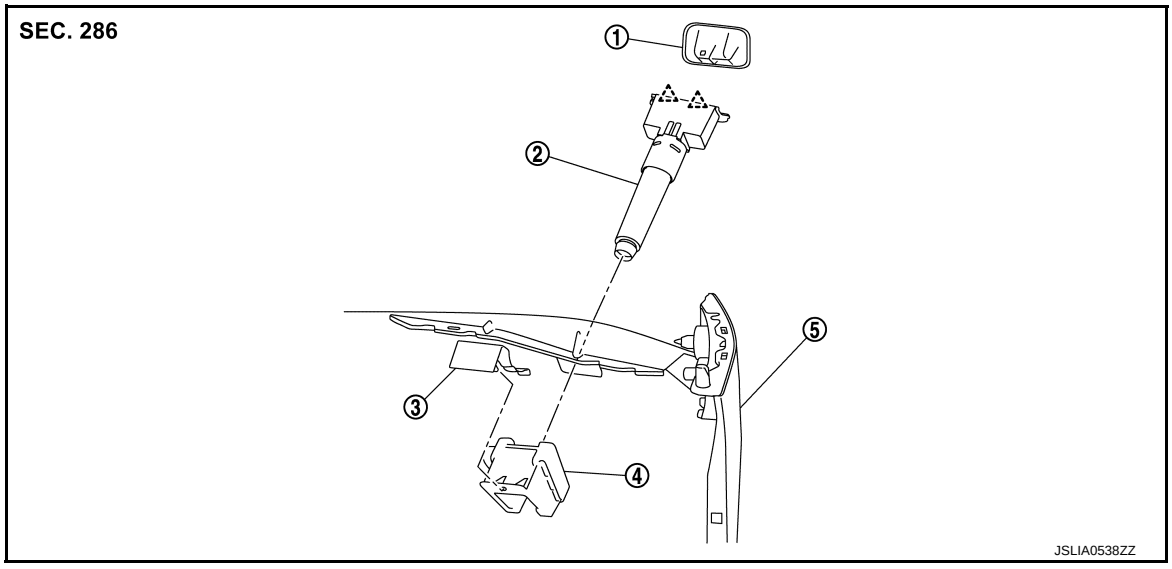
YES >> Replace BCM. Refer to BCS-95, "Removal and Installation".
NO >> Repair or replace the applicable parts.

REMOVAL AND INSTALLATION

HEADLAMP WASHER NOZZLE AND TUBE

Exploded View

INFOID:0000000011509876

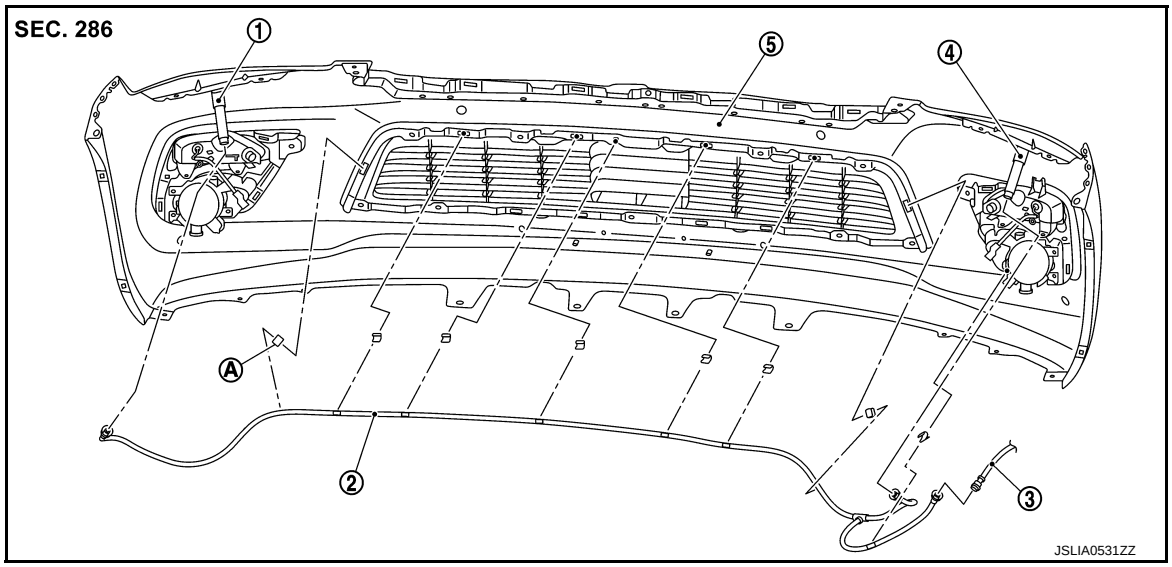


1. Headlamp washer nozzle cover
2. Headlamp washer nozzle assembly
3. Headlamp washer nozzle retainer
4. Headlamp washer nozzle bracket
5. Front bumper fascia

: Pawl

Hydraulic Layout

INFOID:0000000011509877



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

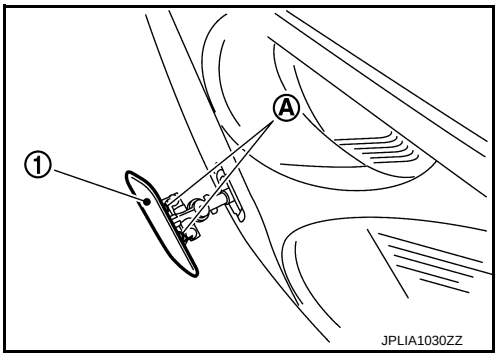
A. Metal clip

Removal and Installation

INFOID:0000000011509878

REMOVAL

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



2. Remove front bumper fascia. Refer to EXT-13, "Removal and Installation".
3. Disconnect headlamp washer tube joint.
4. Remove headlamp washer nozzle retainer.
5. Remove headlamp washer nozzle bracket.
6. Remove headlamp washer nozzle from the front bumper fascia.

INSTALLATION

Install in the reverse order of removal.

Inspection

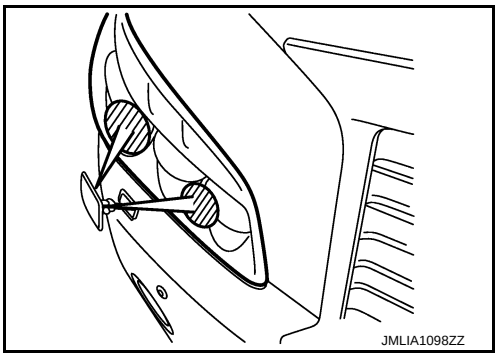
INFOID:0000000011509879

HEADLAMP WASHER NOZZLE SPRAY POSITION INSPECTION

CAUTION:

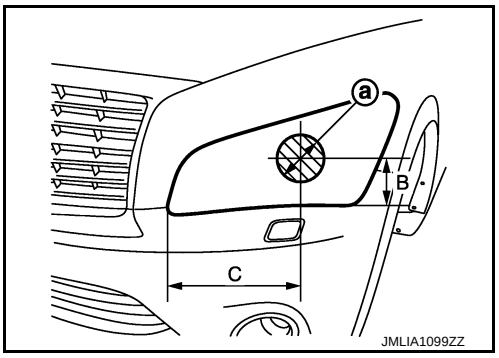
Replace headlamp washer nozzle assembly with a new part if headlamp washer jet position is outside the headlamp illumination area shown in the figure.

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

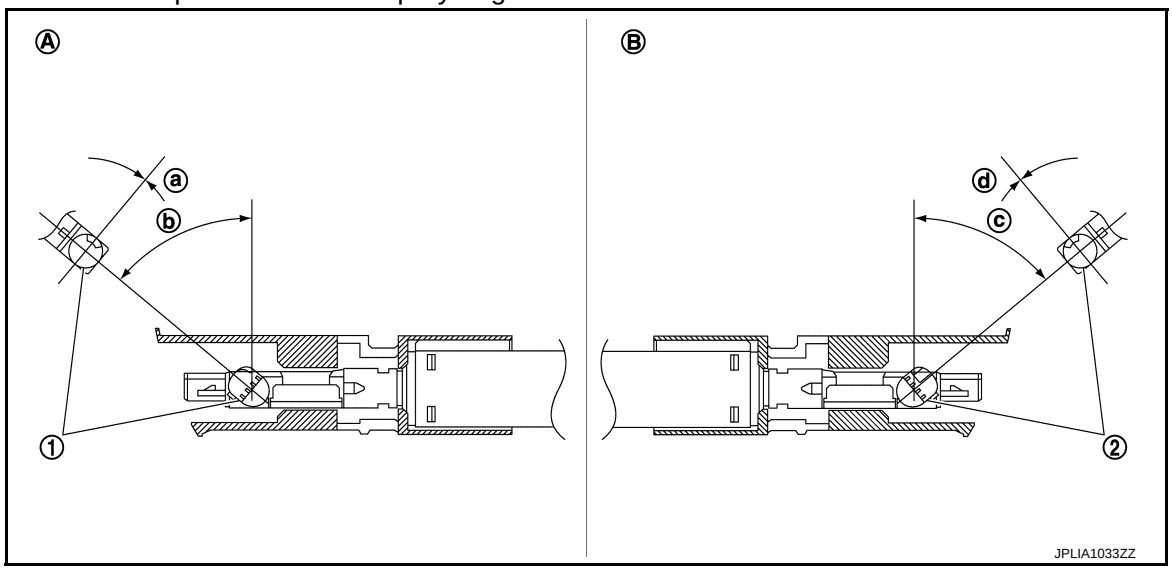


- Check the headlamp washer injection range as shown in the figure.

a : 80 mm (3.15 in)
B : 80 mm (3.15 in)
C : 273 mm (10.75 in)



- Check the headlamp washer nozzle spray angle.



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

Outside (A)

a : 47°± 3°

b : 40°± 3°

Inside (B)

c : 53°± 3°

d : 43°± 3°

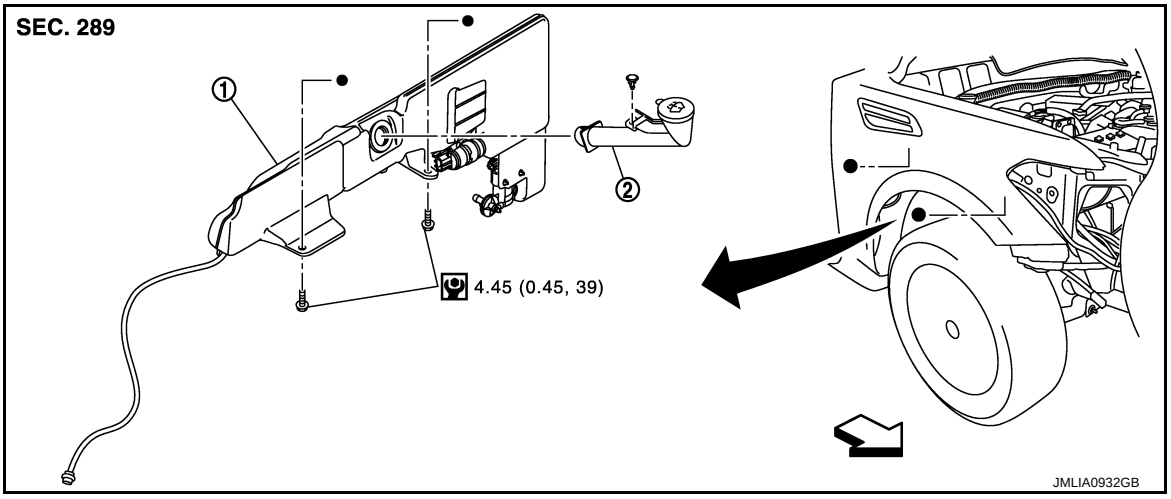
NOTE:

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

WASHER TANK

Exploded View

INFOID:0000000010260742



1. Washer tank
2. Washer tank inlet

⇦ : Vehicle front

: N·m (kg-m, in-lb)

● : Indicates that the part is connected at points with same symbol in actual vehicle.

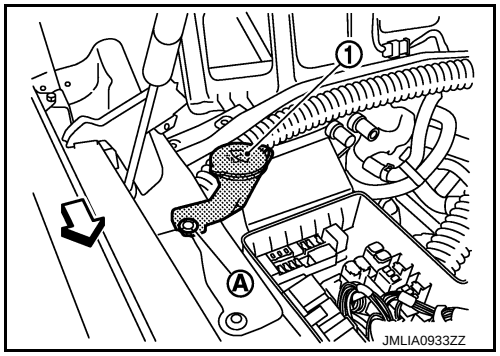
Removal and Installation

INFOID:0000000010260743

REMOVAL

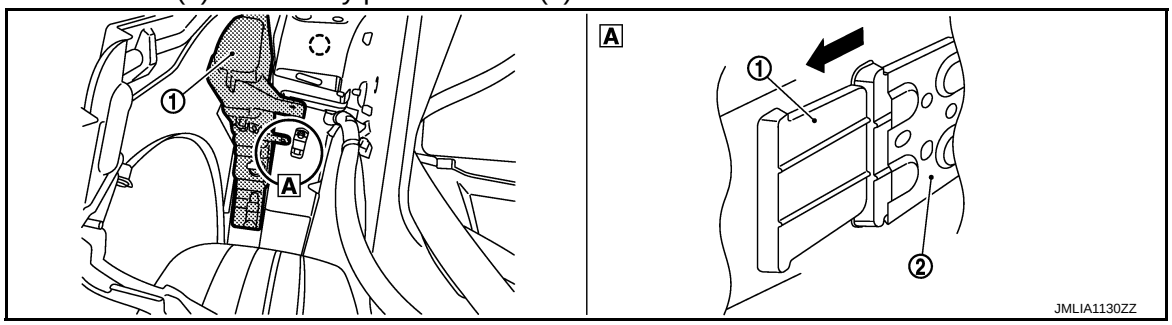
1. Fully open hood.
2. Remove washer tank inlet fixing clip (A).
3. Pull out washer tank inlet (1) from washer tank.

⇦ : Vehicle front



4. Remove fender protector RH (front). Refer to EXT-24, "FENDER PROTECTOR : Removal and Installation".
5. Disconnect washer pump connector.
6. Disconnect headlamp washer pump connector.
7. Disconnect washer level switch connector.
8. Disconnect front washer tube and rear washer tube.
9. Disconnect headlamp washer tube joint.
10. Remove washer tank mounting bolts.

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



INSTALLATION

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

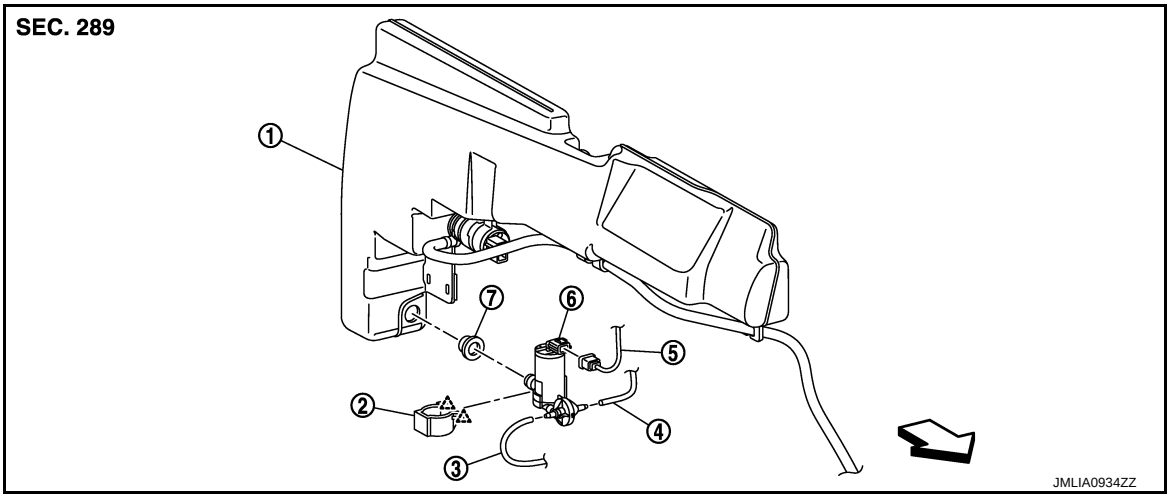
CAUTION:

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

WASHER PUMP

Exploded View

INFOID:0000000010260744



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

: Pawl

: Vehicle front

Removal and Installation

INFOID:0000000010260745

REMOVAL

1. Remove washer tank. Refer to WW-57, "Removal and Installation".
2. Remove washer pump from washer tank.
3. Remove packing from washer tank.

INSTALLATION

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

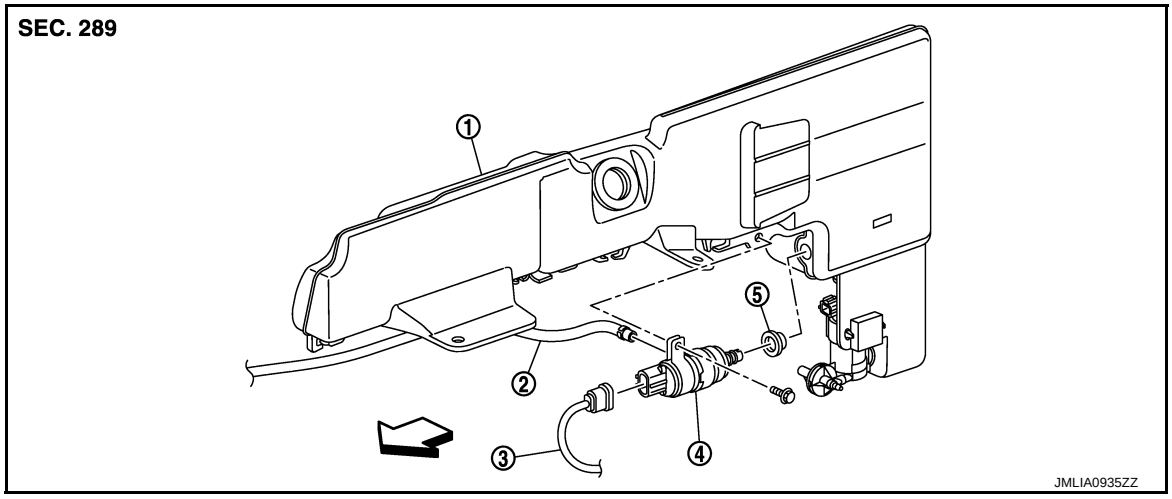
CAUTION:

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

HEADLAMP WASHER PUMP

Exploded View

INFOID:0000000010260746



1. Washer tank
2. Headlamp washer tube
3. Headlamp washer pump harness connector
4. Headlamp washer pump
5. Packing

⇦ : Vehicle front

Removal and Installation

INFOID:0000000010260747

REMOVAL

1. Remove washer tank. Refer to WW-57, "Removal and Installation".
2. Remove the mounting bolt, and then remove headlamp washer pump from the washer tank.
3. Remove the packing from the washer tank.

INSTALLATION

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

CAUTION:

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

WASHER LEVEL SWITCH

Removal and Installation

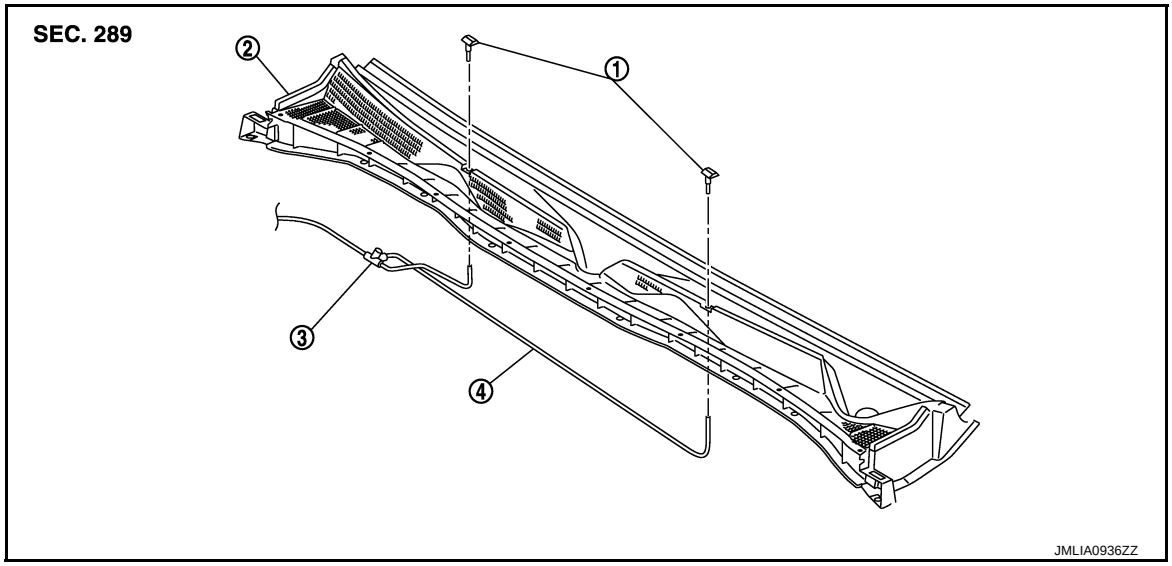
INFOID:0000000010260748

The washer level switch must be replaced together with the washer tank as an assembly. Refer to WW-57, "Removal and Installation".

FRONT WASHER NOZZLE AND TUBE

Exploded View

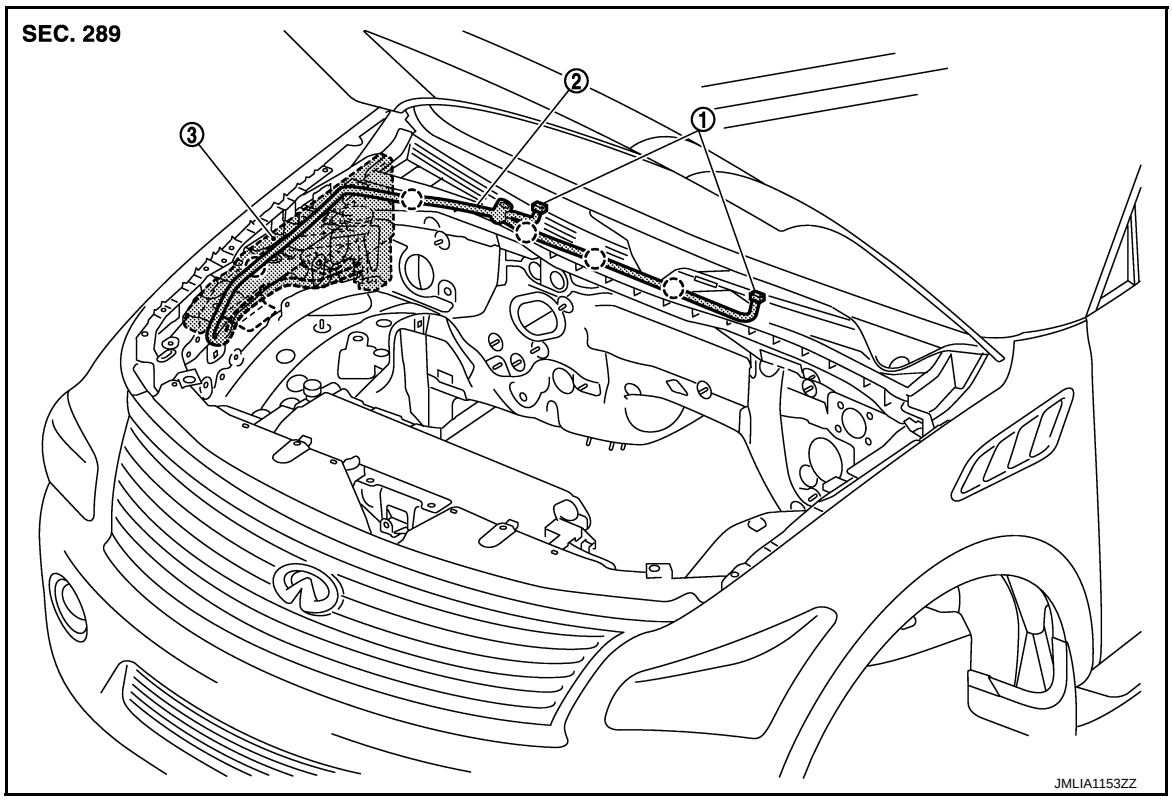
INFOID:0000000010260749



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

Hydraulic Layout

INFOID:0000000010260750



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

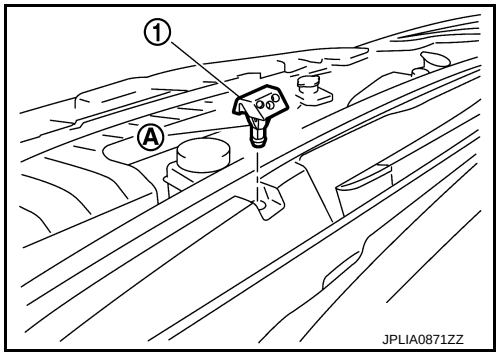
: Clip

Removal and Installation

INFOID:0000000010260751

REMOVAL

1. Remove cowl top cover. Refer to EXT-22, "Removal and Installation".
2. Disconnect front washer tube from front washer nozzle.
3. While pressing pawl (A) on the cowl top cover front side of front washer nozzle (1), remove front washer nozzle from cowl top cover.



INSTALLATION

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

CAUTION:

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

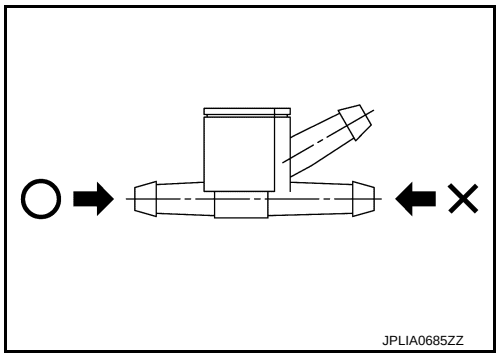
Inspection and Adjustment

INFOID:0000000010260752

INSPECTION

Check valve Inspection

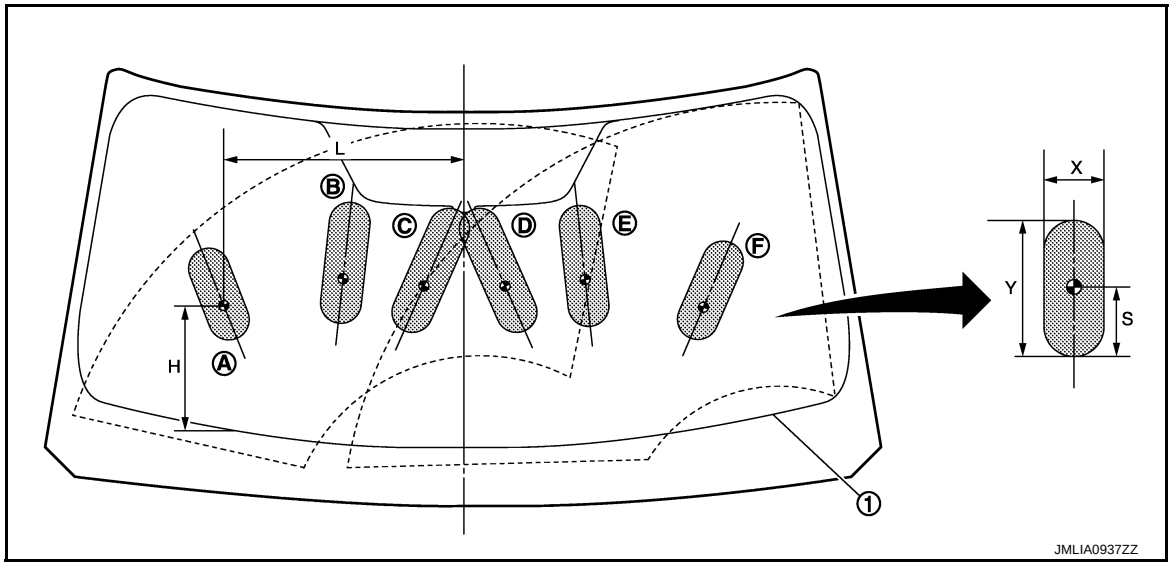
Check that air can pass through the hose by blowing forward (toward the nozzle), and check that air cannot pass through by sucking.



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

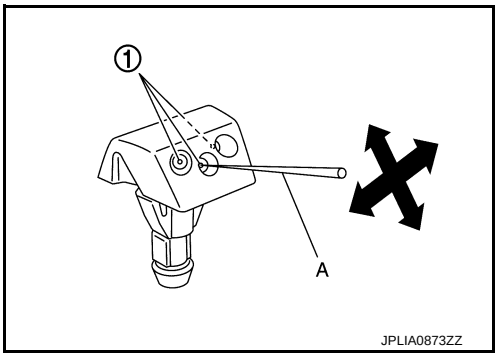
Unit: mm (in)

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

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

NOTE:

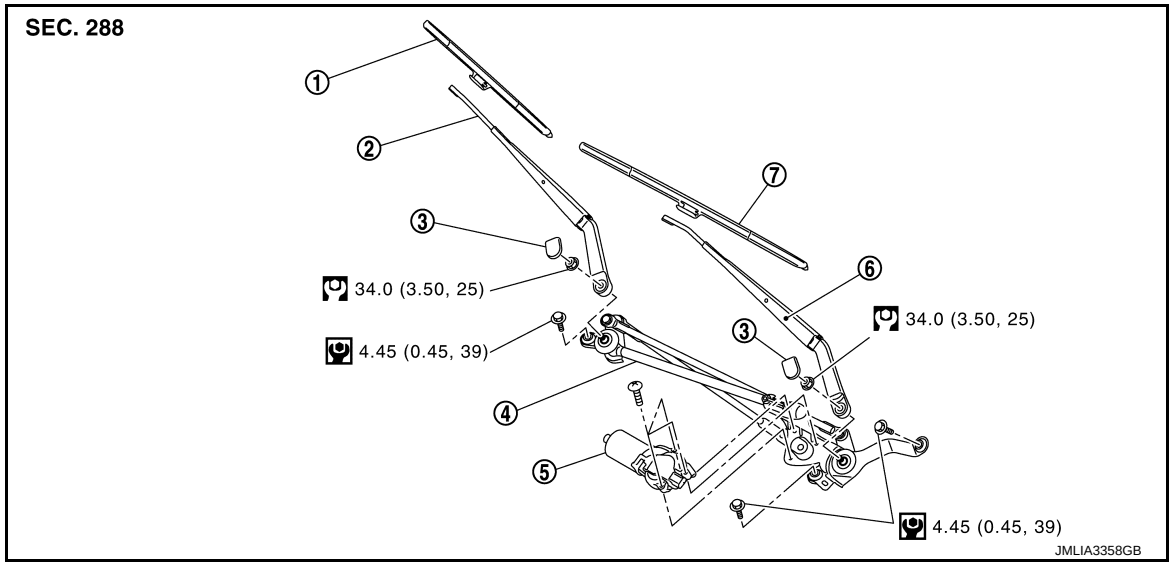
If wax or dust gets into the nozzle, remove wax or dust with a needle or small pin.



FRONT WIPER ARM

Exploded View

INFOID:0000000010260753



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

: N·m (kg-m, ft-lb)

: N·m (kg-m, in-lb)

Removal and Installation

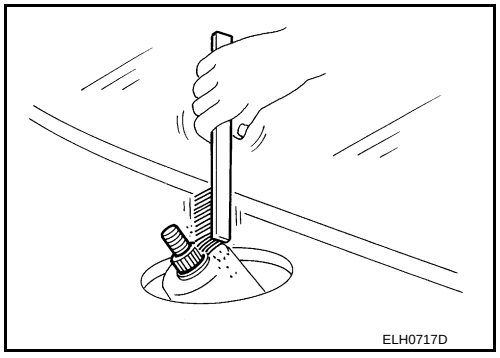
INFOID:0000000010260754

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-65, "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.

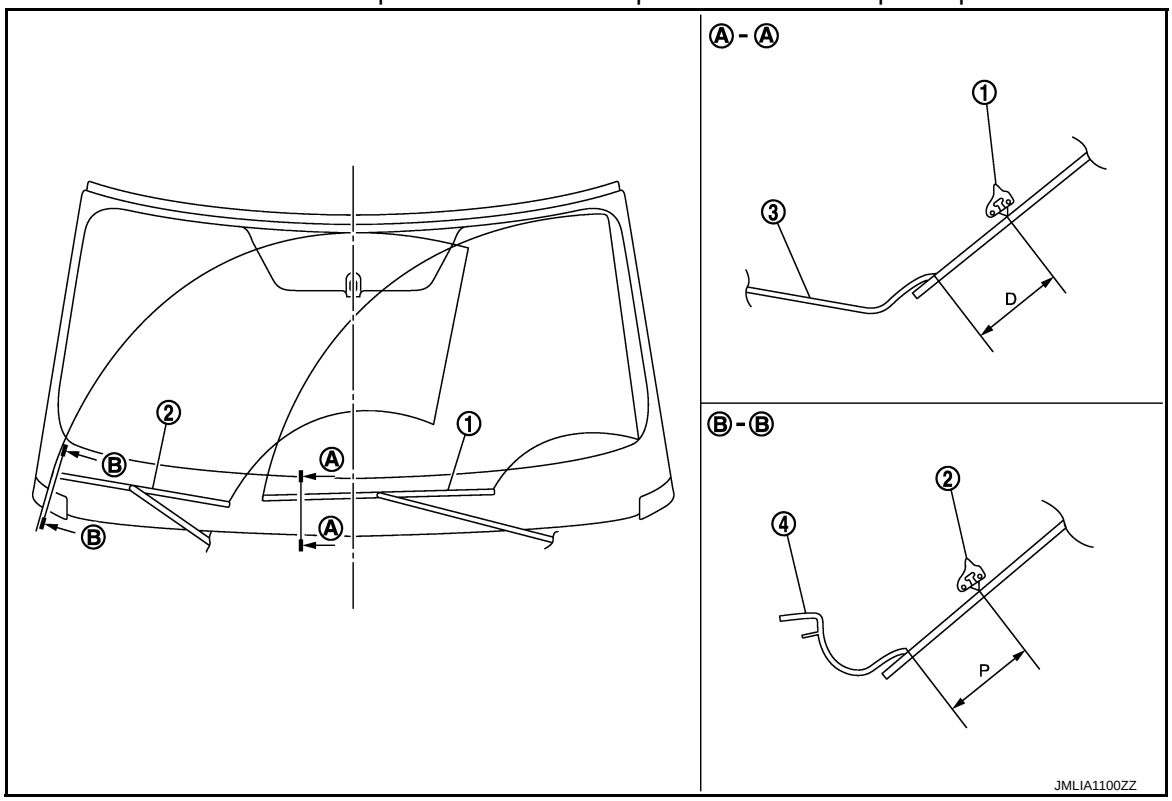


Adjustment

INFOID:0000000010260755

WIPER BLADE POSITION ADJUSTMENT

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



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

Standard clearance

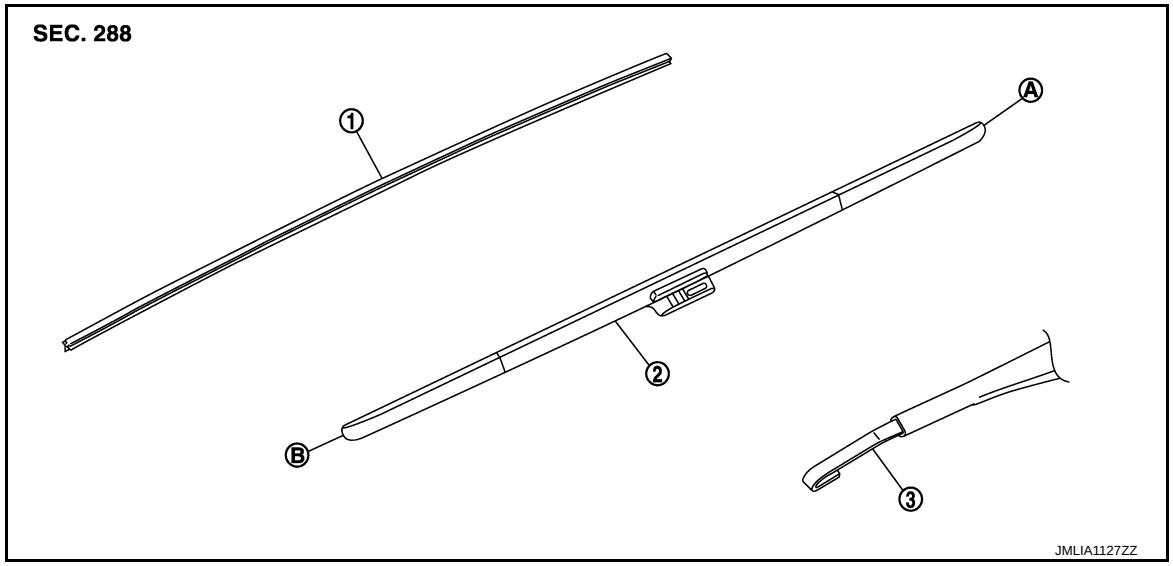
P : 51.6 ± 7.5 mm (2.031 ± 0.295 in)

D : 53.6 ± 7.5 mm (2.110 ± 0.295 in)

FRONT WIPER BLADE

Exploded View

INFOID:0000000010260756



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

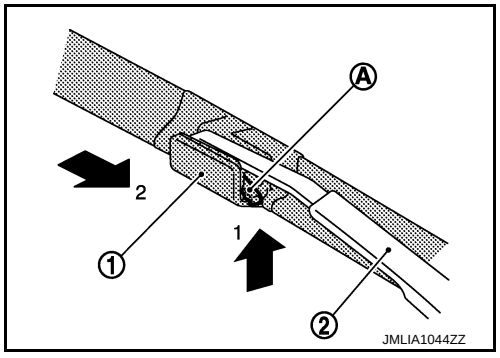
A. Wiper blade end
B. Wiper blade tip

Removal and Installation

INFOID:0000000010260757

REMOVAL

1. Push up the lever (A) of wiper blade (1), while sliding wiper blade toward the direction of the arrow, to remove it from wiper arm (2).
   CAUTION:
   Be careful not to drop the wiper blade onto the windshield glass.



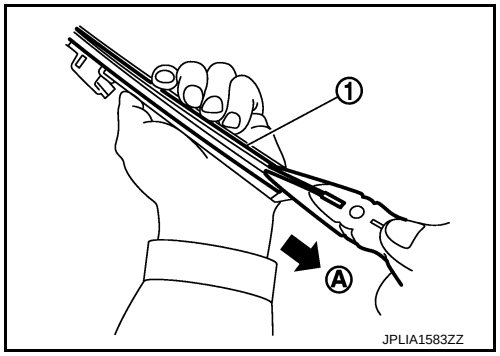
INSTALLATION

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

Replacement

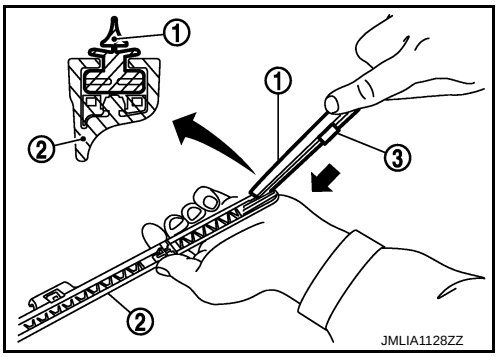
INFOID:0000000010260758

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).

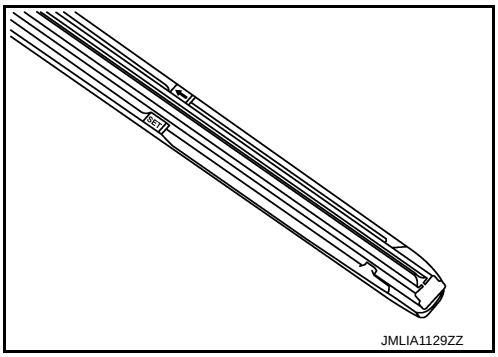


2. Insert the tip of new wiper refill (1) into the rear end of wiper blade (2). Slide the new wiper refill to the direction shown by the arrow while pressing the new wiper refill onto the wiper blade rear end.
   NOTE:
   - Insert the wiper refill to be held securely by tab of wiper blade as shown in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

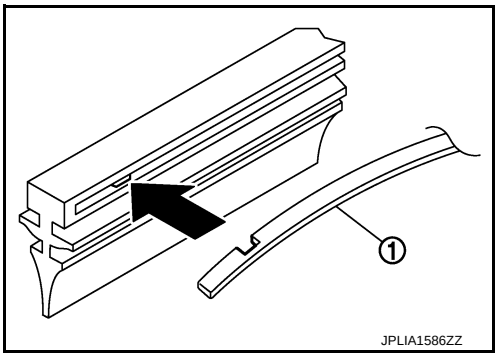
   *: Attached to service parts.



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.

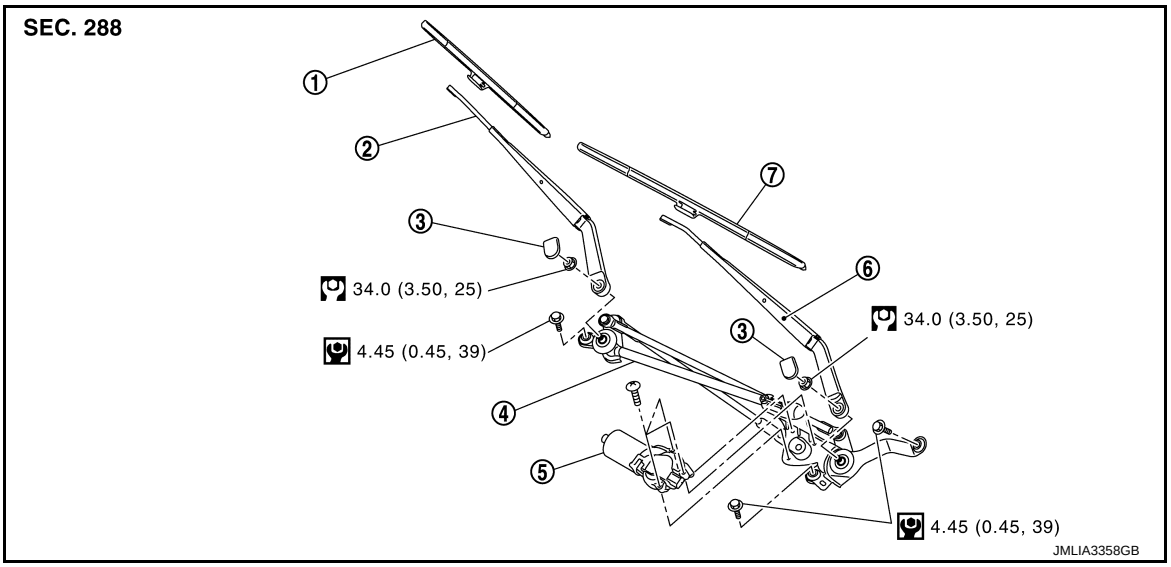


FRONT WIPER DRIVE ASSEMBLY

Exploded View

INFOID:0000000010260759

REMOVAL

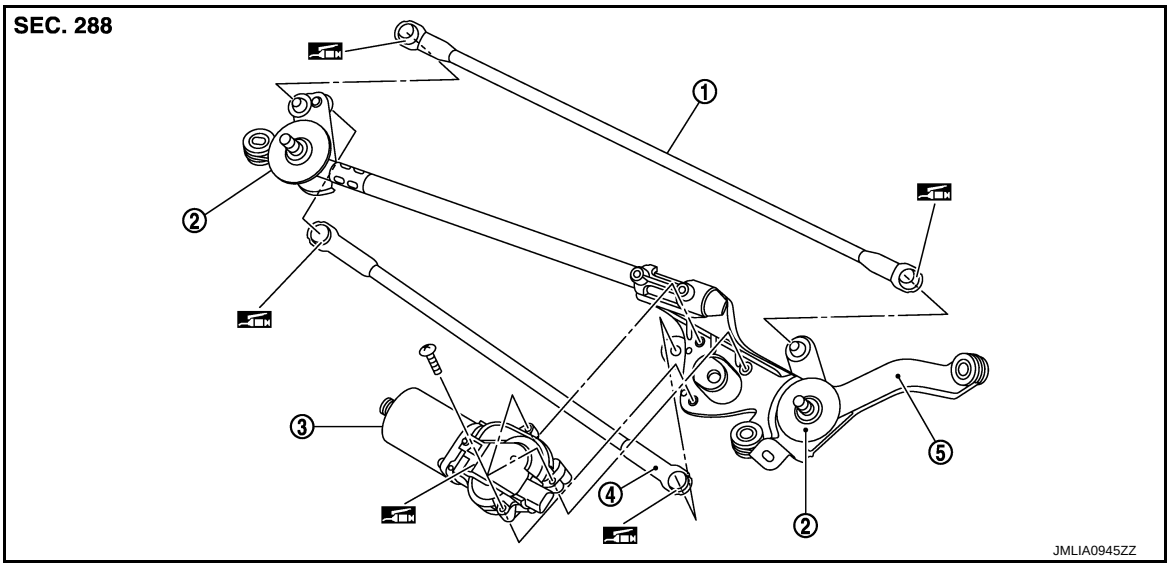


1. Front wiper blade RH
2. Front wiper arm RH
3. Front wiper arm cap
4. Front wiper drive assembly
5. Front wiper motor
6. Front wiper arm LH
7. Front wiper blade LH

: N·m (kg-m, ft-lb)

: N·m (kg-m, in-lb)

DISASSEMBLY



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

: Multi–purpose grease or an equivalent.

Removal and Installation

INFOID:0000000010260760

REMOVAL

1. Remove front wiper arms (LH and RH). Refer to WW-65, "Removal and Installation".
2. Remove cowl top cover. Refer to EXT-22, "Removal and Installation".
3. Disconnect the front wiper motor connector.
4. Remove the mounting bolts from front wiper drive assembly.
5. Remove the front wiper drive assembly from the vehicle.

INSTALLATION

1. Install the front wiper drive assembly to the vehicle.
2. Connect front wiper motor connector.
3. Operate front wiper to move it to the auto stop position.
4. Install cowl top cover. Refer to EXT-22, "Removal and Installation".
5. Install front wiper arms. Refer to WW-65, "Removal and Installation".

Disassembly and Assembly

INFOID:0000000010260761

DISASSEMBLY

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

ASSEMBLY

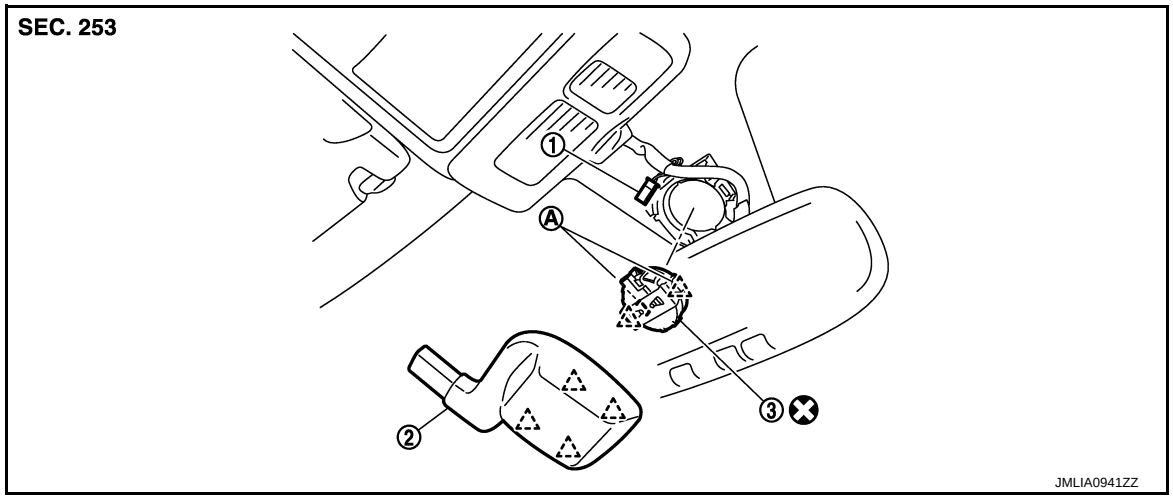
1. Connect the front wiper motor connector.
2. Operate the front wiper to move it to the auto stop position.
3. Disconnect the front wiper motor connector.
4. Install the front wiper motor to the front wiper frame.
5. Install the front wiper linkage 2 to the front wiper motor and the front wiper frame.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

LIGHT & RAIN SENSOR

Exploded View

INFOID:0000000010260762

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



1. Light & rain sensor connector
2. Light & rain sensor cover
3. Light & rain sensor
A. Metal spring clip
: Pawl
: Always replace after every disassembly.

Removal and Installation

INFOID:0000000010260763

REMOVAL

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

INSTALLATION

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

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

WIPER AND WASHER SWITCH

Exploded View

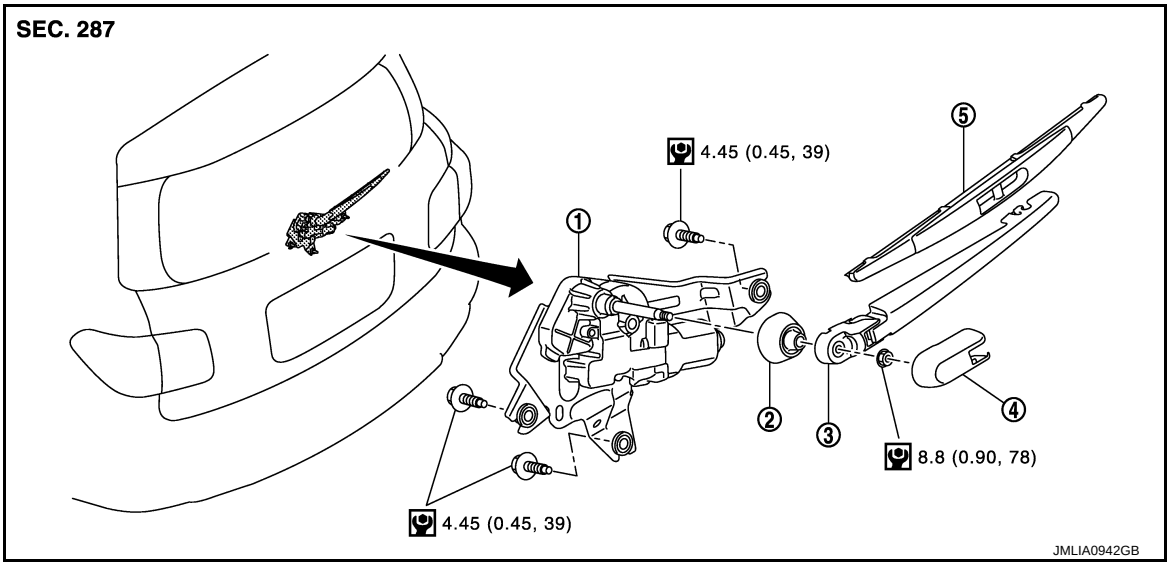
INFOID:0000000010260764

Refer to BCS-96, "Exploded View".

REAR WIPER ARM

Exploded View

INFOID:0000000010260765



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

: N·m (kg-m, in-lb)

Removal and Installation

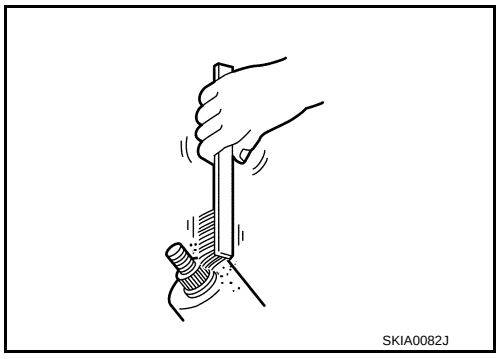
INFOID:0000000010260766

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-73, "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

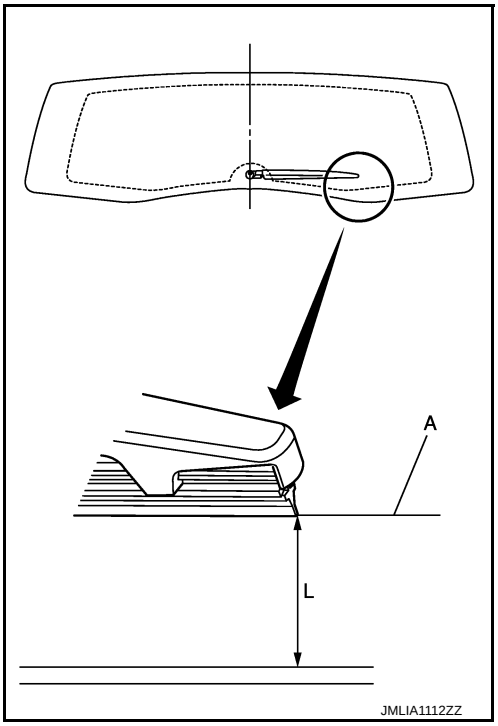
INFOID:0000000010260767

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

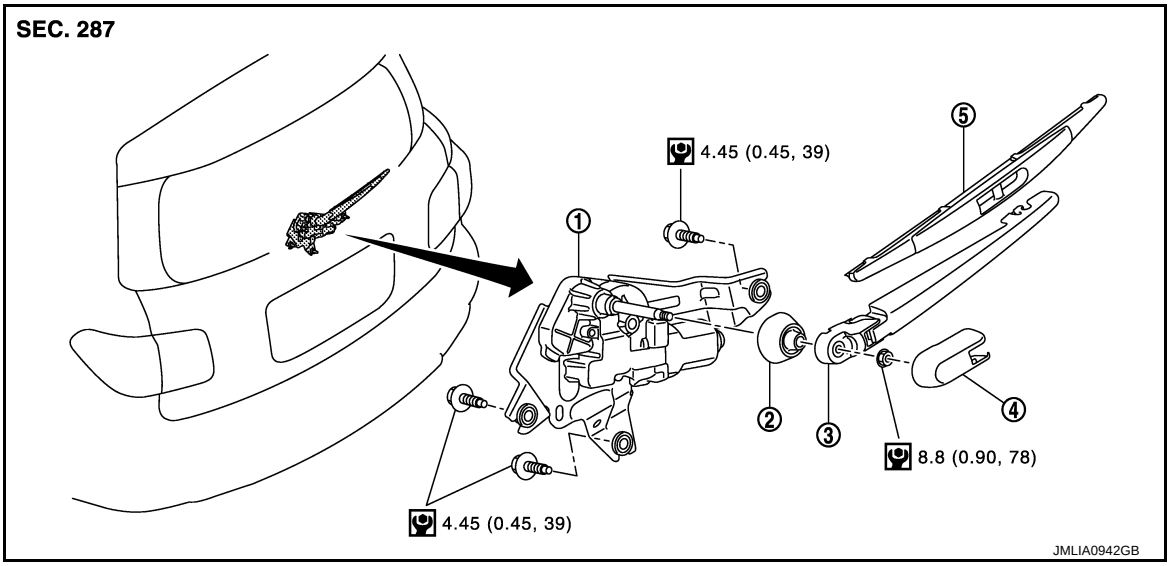
L : 88.5 ± 7.5 mm (3.484 ± 0.295 in)



REAR WIPER MOTOR

Exploded View

INFOID:0000000010260768



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

: N·m (kg-m, in-lb)

Removal and Installation

INFOID:0000000010260769

REMOVAL

1. Remove rear wiper arm. Refer to WW-73, "Removal and Installation".
2. Remove back door finisher inner. Refer to INT-39, "Removal and Installation".
3. Disconnect rear wiper motor connector.
4. Remove rear wiper motor mounting bolts.
5. Remove rear wiper motor from the vehicle.
6. Remove the pivot seal.

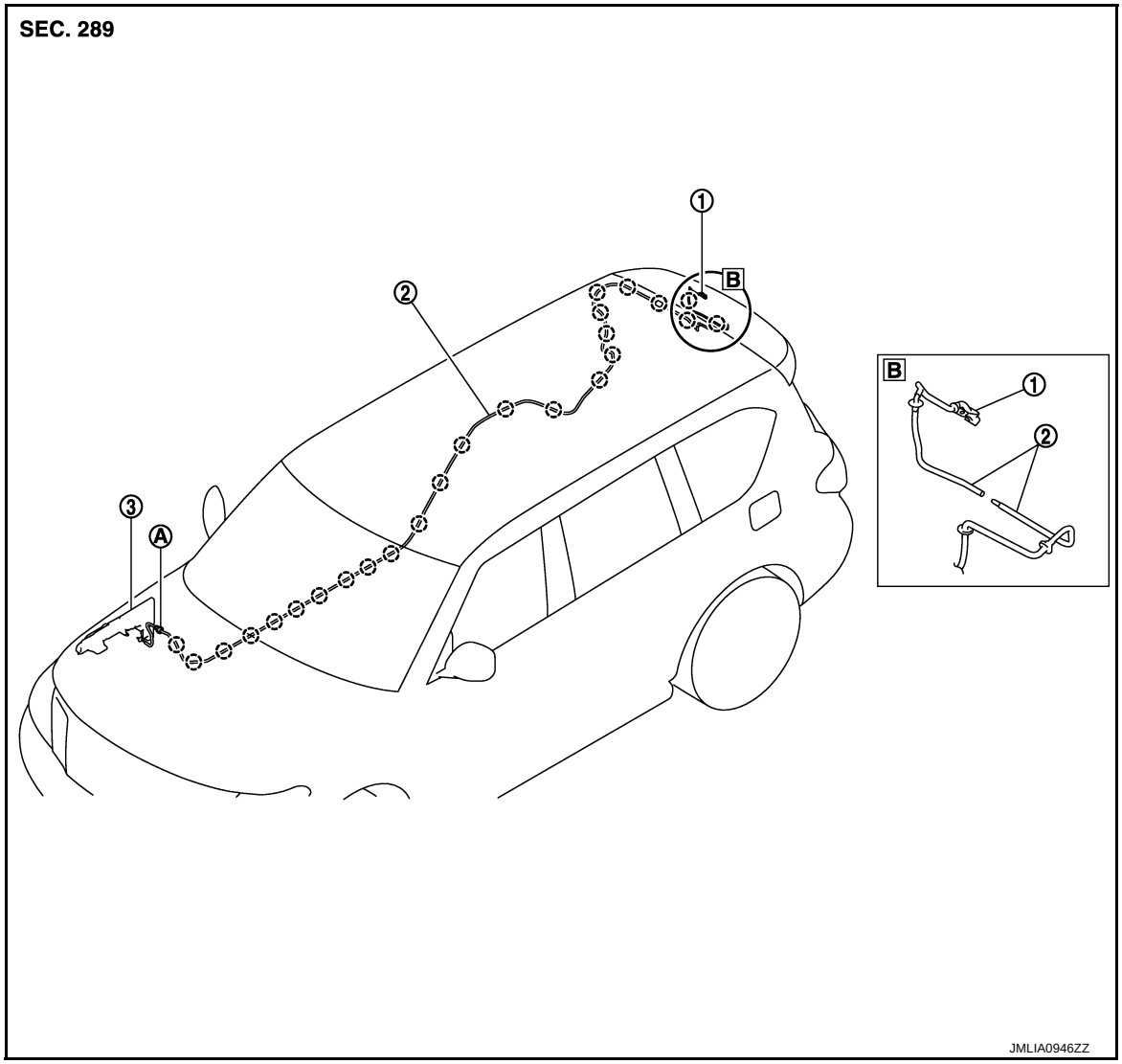
INSTALLATION

Install in the reverse order of removal.

REAR WASHER NOZZLE AND TUBE

Hydraulic Layout

INFOID:0000000010260770



1. Rear washer nozzle
2. Rear washer tube
3. Washer tank

A : Grommet

: Clip

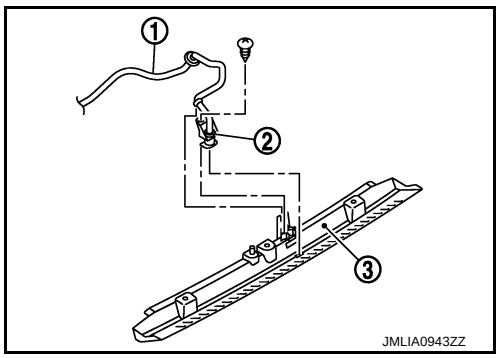
Removal and Installation

INFOID:0000000010260771

REMOVAL

1. Remove rear spoiler. Refer to EXT-42, "Removal and Installation".
2. Remove high-mounted stop lamp. Refer to EXL-168, "Removal and Installation".

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



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INSTALLATION

Install in the reverse order of removal.

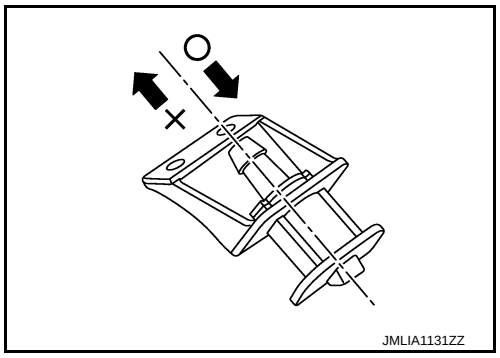
Inspection and Adjustment

INFOID:0000000010260772

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.



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ADJUSTMENT

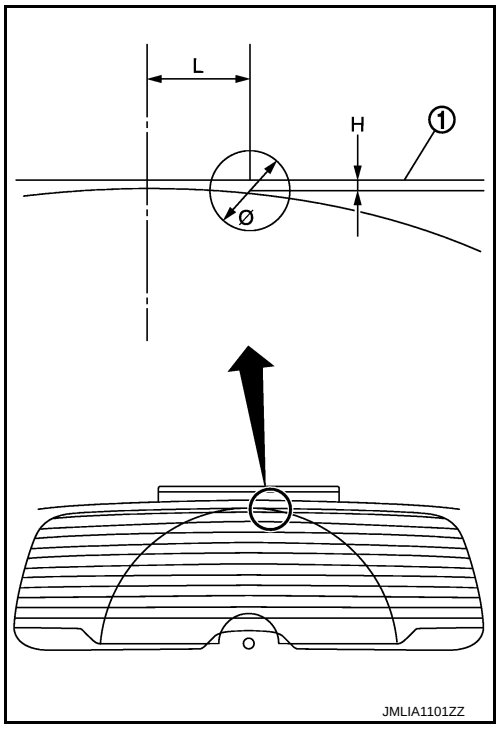
Washer Nozzle Spray Position adjustment

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

1 : Black printed frame line

Unit: mm (in)

L : Length	H : Height	ϕ : Spray area
40.7 (1.60)	3.9 (0.15)	30 (1.18)



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

NOTE:

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