SECTION WW
WIPER & WASHER

CONTENTS

PRECAUTION

PRECAUTIONS

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

INFOID:0000000012229384

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 SR and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which 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 the SR section.**
- **Do not 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

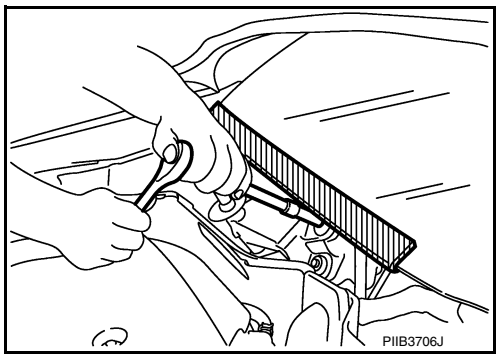
WARNING:

- **When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT 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 three minutes before performing any service.**

Precaution for Procedure without Cowl Top Cover

INFOID:0000000012157309

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 Work

INFOID:0000000012157310

- When removing or disassembling each component, be careful not to damage or deform it. If a component may be subject to interference, be sure to protect it with a shop cloth.
- When removing (disengaging) components with a screwdriver or similar tool, be sure to wrap the component with a shop cloth or vinyl tape to protect it.
- Protect the removed parts with a shop cloth and prevent them from being dropped.
- Replace a deformed or damaged clip.
- If a part is specified as a non-reusable part, always replace it with a new one.
- Be sure to tighten bolts and nuts securely to the specified torque.
- After installation is complete, be sure to check that each part works properly.
- Follow the steps below to clean components.

- Water soluble dirt:
- Dip a soft cloth into lukewarm water, wring the water out of the cloth and wipe the dirty area.
- Then rub with a soft, dry cloth.

- Oily dirt:

- Dip a soft cloth into lukewarm water with mild detergent (concentration: within 2 to 3%) and wipe the dirty area.
- Then dip a cloth into fresh water, wring the water out of the cloth and wipe the detergent off.
- Then rub with a soft, dry cloth.

- Do not use organic solvent such as thinner, benzene, alcohol or gasoline.
- For genuine leather seats, use a genuine leather seat cleaner.

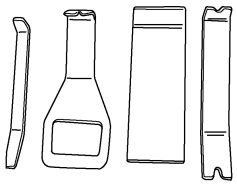
PREPARATION

PREPARATION

Special Service Tools

INFOID:0000000012157311

The actual shape of the tools may differ from those illustrated here.

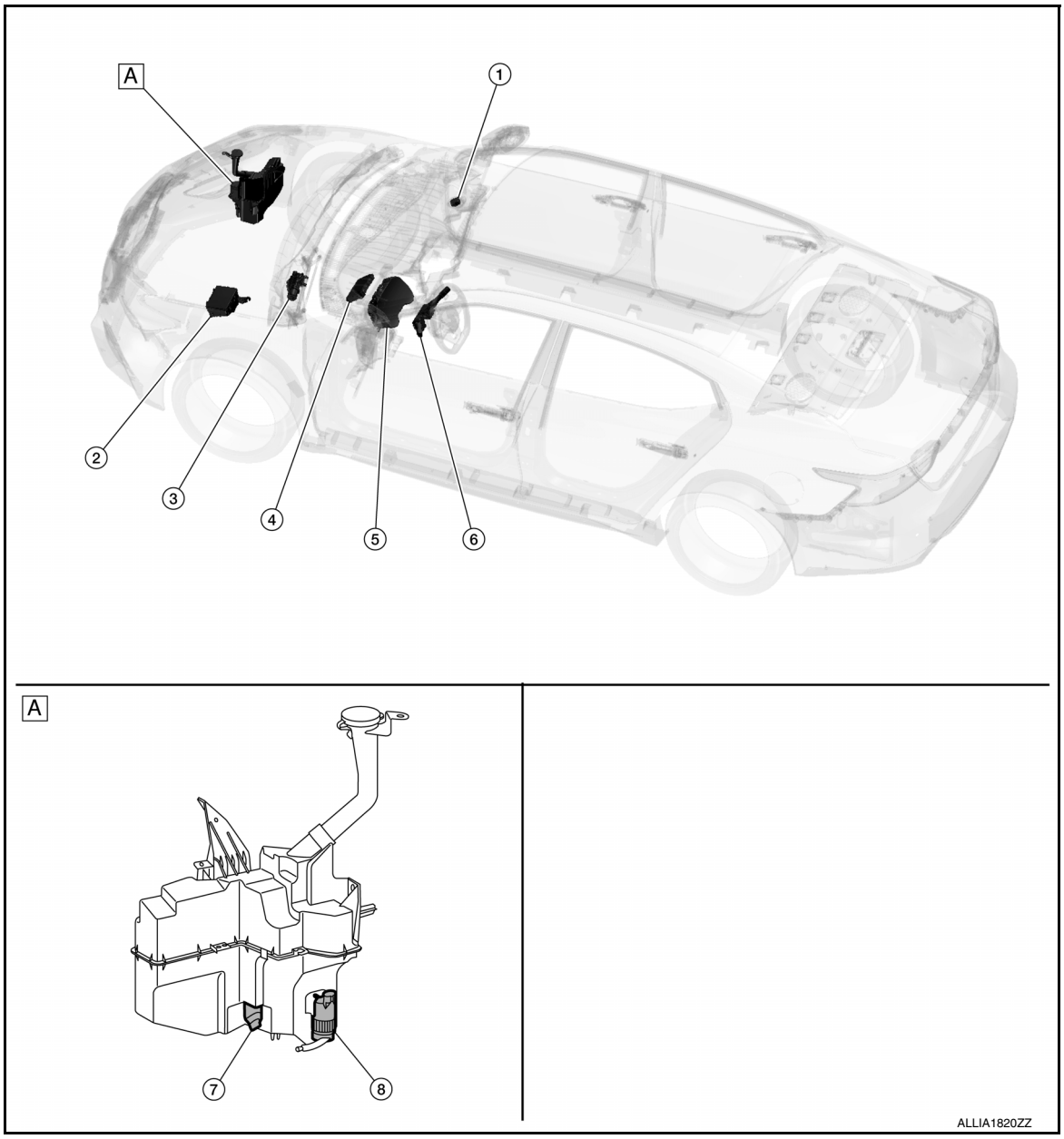
Tool number (TechMate No.) Tool name	Description
— (J-46534) Trim Tool Set  AWJIA0483ZZ	Removing trim components

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000012157312



A. View with washer tank removed from vehicle

No.	Component	Function
1.	Rain sensor*	Refer to WW-7, "Rain Sensor".
2.	IPDM E/R	• Controls integrated relays according to the request (via CAN communication) from BCM. • Performs the auto stop control of front wiper. • Refer to PCS-5, "Component Parts Location" for detailed installation location.
3.	Front wiper motor	Refer to WW-7, "Front Wiper Motor".

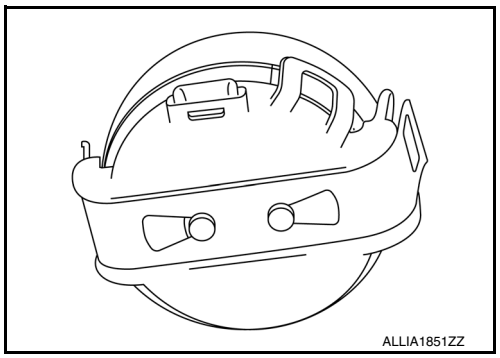
No.	Component	Function
4.	BCM	• Judges each switch status by the combination switch (wiper and washer switch) reading function. • Requests (via CAN communication) the front wiper relay and the front wiper HI/LO relay ON to IPDM E/R. • Refer to BCS-5, "BODY CONTROL SYSTEM : Component Parts Location" for detailed installation location.
5.	Combination meter	• Transmits vehicle speed signal to BCM via CAN communication. • Refer to MWI-5, "METER SYSTEM : Component Parts Location" for detailed installation location.
6.	Combination switch (wiper and washer switch)	• Combination switch (wiper and washer switch): Transmits the status of the combination switch (wiper and washer switch) to BCM. • Washer switch: Refer to WW-7, "Washer Switch".
7.	Washer fluid level switch	Refer to WW-8, "Washer Fluid Level Switch".
8.	Front washer motor	Refer to WW-8, "Front Washer Motor".

*: For vehicles equipped with driver assistance system.

Rain Sensor

INFOID:0000000012226869

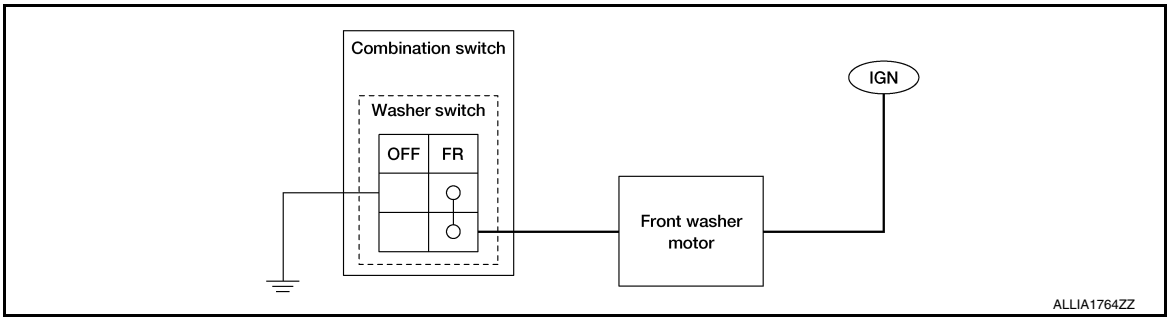
Detects water droplets on the windshield with infrared rays, and transmits the rain sensor signal to BCM via the rain sensor serial link.



Washer Switch

INFOID:0000000012157313

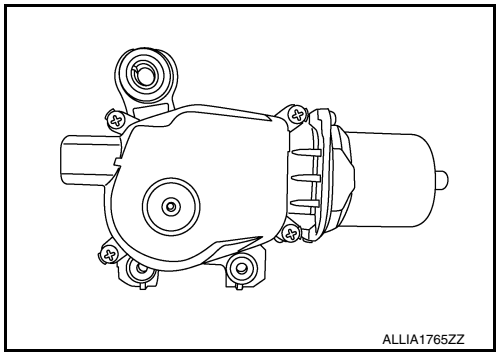
- Washer switch is integrated with combination switch (wiper and washer switch).
- Washer pump is grounded through the combination switch (wiper and washer switch) while the washer switch is ON.



Front Wiper Motor

INFOID:0000000012157314

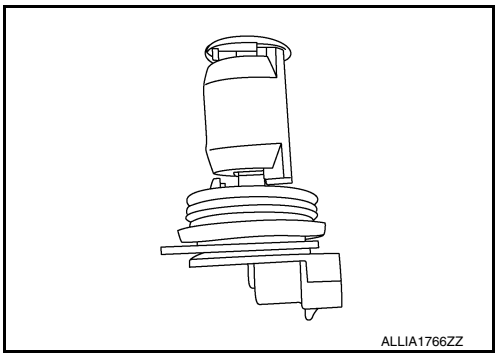
- Controls front wiper operation with IPDM E/R control.
- Transmits front wiper stop position signal to IPDM E/R.



Washer Fluid Level Switch

INFOID:0000000012157315

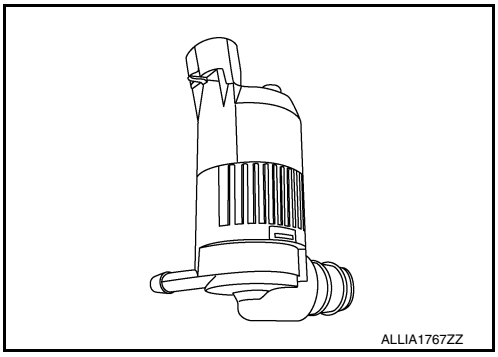
Detects that washer fluid level is low and transmits washer level signal to combination meter.



Front Washer Motor

INFOID:0000000012157316

Washer fluid is sprayed according to washer switch status.



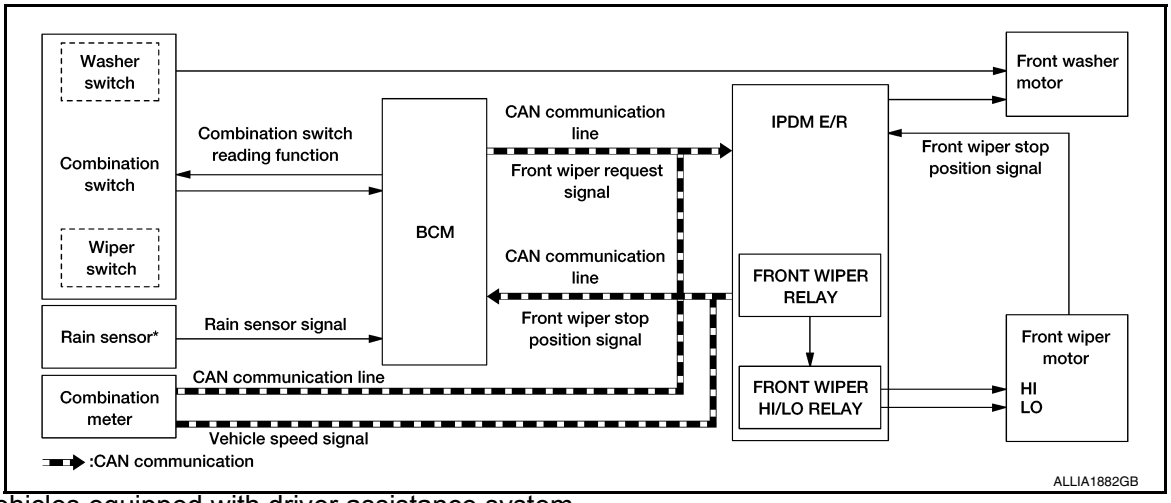
SYSTEM

FRONT WIPER AND WASHER SYSTEM

FRONT WIPER AND WASHER SYSTEM : System Description

INFOID:0000000012157317

SYSTEM DIAGRAM



*:For vehicles equipped with driver assistance system.

OUTLINE

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

Control by BCM:
- Combination switch (wiper and washer switch) reading function
- Front wiper control function

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

FRONT WIPER BASIC OPERATION

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

FRONT WIPER LO OPERATION

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

Front wiper LO operating condition:
- 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 HI/LO 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. 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. 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, the 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-16, "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	Medium–high sensitivity
3	Low–medium sensitivity
4	Low sensitivity

NOTE:

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

Splash mode operation

The 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 INT OPERATION

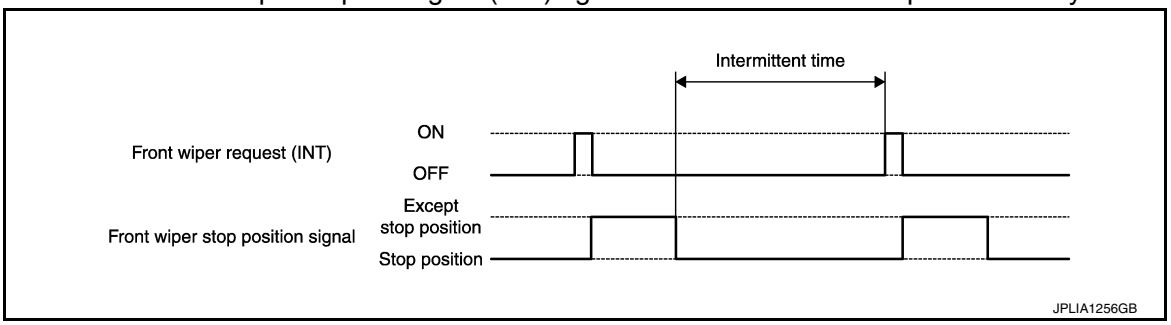
- BCM transmits the front wiper request signal (INT) to IPDM E/R via CAN communication depending on the front wiper INT operating condition and intermittent operation delay interval according to the wiper volume dial position.

Front wiper INT operating condition:

- Ignition switch ON
- Front wiper switch INT

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

- BCM transmits the front wiper request signal (INT) again after the intermittent operation delay interval.



NOTE:
Front wiper intermittent operation can be set to operation linked or not linked with vehicle speed using CONSULT. Refer to WW-16, "WIPER : CONSULT Function (BCM - WIPER)".

Front wiper intermittent operation with vehicle speed

- BCM calculates the intermittent operation delay interval from the following:
- Vehicle speed signal
- Wiper volume dial position

Intermittent operation delay Interval

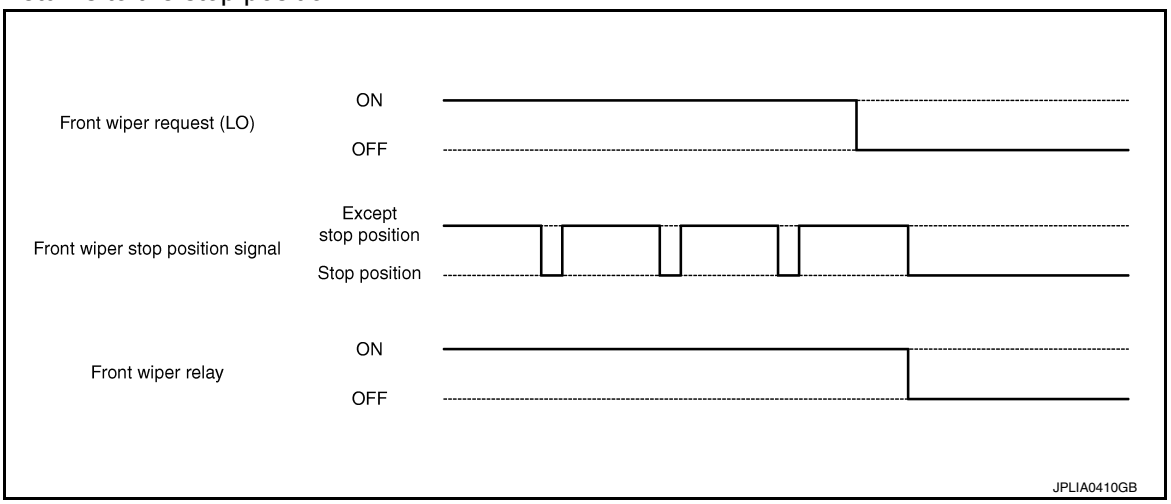
Unit: Second

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

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

FRONT WIPER AUTO STOP OPERATION

- BCM stops transmitting the front wiper request signal when the front wiper switch is turned OFF.
- IPDM E/R detects the front wiper stop position signal from the front wiper motor and detects the front wiper motor position (stop position/except stop position).
- When the front wiper request signal is stopped, IPDM E/R turns ON the front wiper relay until the front wiper motor returns to the stop position.



NOTE:
- BCM stops the transmitting of the front wiper request signal when the 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 (wiper and washer switch) with the front washer switch ON.

FRONT WIPER AND WASHER SYSTEM : Fail-Safe

INFOID:0000000012157318

CAN COMMUNICATION CONTROL

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

If No CAN Communication Is Available With BCM

Control part	Fail-safe operation
Front wiper motor	• The status just before activation of fail-safe control is maintained until the ignition switch is turned OFF while the front wiper is operating at LO or HI speed. • The wiper is operated at LO speed until the ignition switch is turned OFF if the fail-safe control is activated while the front wiper is set in the INT mode and the front wiper motor is operating. • Automatically returns wiper to stop position when ignition switch is turned ON if fail-safe control is activated while front wiper motor is operated and wiper stop is in any 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) can not 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.

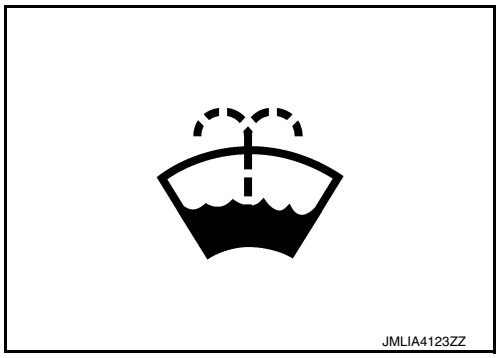
INFORMATION DISPLAY (COMBINATION METER)

INFORMATION DISPLAY (COMBINATION METER) : Washer Fluid Warning

INFOID:0000000012157319

DESIGN/PURPOSE

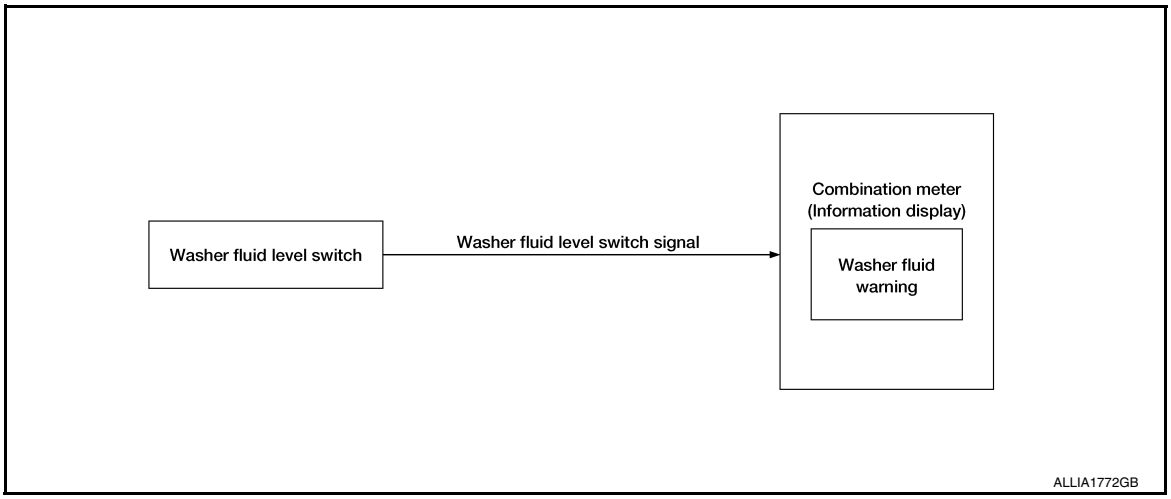
Washer fluid warning reminds driver the washer fluid is insufficient.

Symbol	Message
 JMLIA4123ZZ	Low Washer Fluid

SYNCHRONIZATION WITH MASTER WARNING LAMP

Not applicable

SYSTEM DIAGRAM



SIGNAL PATH

- When washer fluid level is low, washer fluid level switch turns ON and transmits washer fluid level switch signal to combination meter.
- Combination meter displays washer fluid warning according to washer fluid level switch signal.

WARNING/INDICATOR OPERATING CONDITION

When all of the conditions listed below are satisfied:

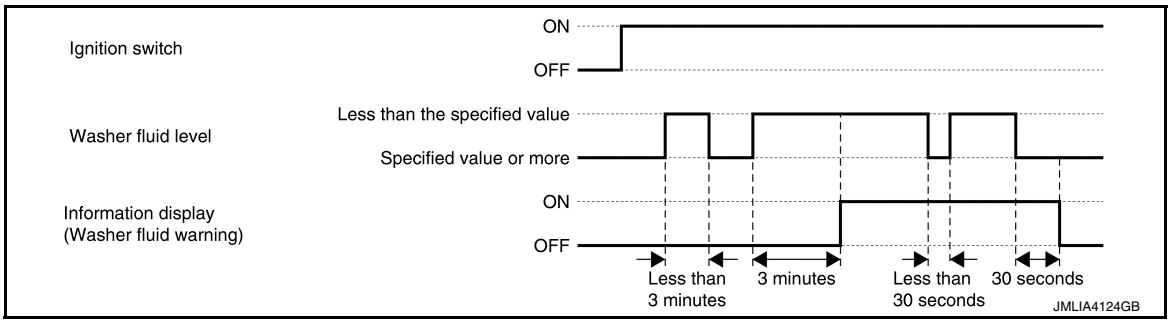
- Ignition switch is ON.
- Washer fluid is insufficient. (Washer fluid level switch is ON and 3 minutes have passed)

WARNING/INDICATOR CANCEL CONDITION

When any of the condition listed below is satisfied:

- Ignition switch is OFF.
- After the washer fluid is refilled. (Washer fluid level switch is OFF and 30 seconds have passed)

TIMING CHART



WARNING/INDICATOR/CHIME LIST

WARNING/INDICATOR/CHIME LIST : Warning/Indicator (Information Display)

INFOID:0000000012157320

Item	Reference
Low windshield-washer fluid warning light	Refer to WW-12, "INFORMATION DISPLAY (COMBINATION METER) : Washer Fluid Warning".

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

INFOID:0000000012193920

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

Direct Diagnostic Mode	Description
ECU Identification	The BCM part number is displayed.
Self Diagnostic Result	The BCM self diagnostic results are displayed.
Data Monitor	The BCM input/output data is displayed in real time.
Active Test	The BCM activates outputs to test components.
Work support	The settings for BCM functions can be changed.
Configuration	• The vehicle specification can be read and saved. • The vehicle specification can be written when replacing BCM.
CAN Diag Support Mntr	The result of transmit/receive diagnosis of CAN communication is displayed.

SYSTEM APPLICATION
BCM can perform the following functions:

System	Sub System	Direct Diagnostic Mode						
		ECU Identification	Self Diagnostic Result	Data Monitor	Active Test	Work support	Configuration	CAN Diag Support Mntr
Door lock	DOOR LOCK		×	×	×	×		
Rear window defogger	REAR DEFOGGER			×	×	×		
Warning chime	BUZZER			×	×			
Interior room lamp timer	INT LAMP			×	×	×		
Exterior lamp	HEADLAMP			×	×	×		
Wiper and washer	WIPER			×	×	×		
Turn signal and hazard warning lamps	FLASHER			×	×	×		
Air conditioner	AIR CONDITIONER			×				
Intelligent Key system	INTELLIGENT KEY		×	×	×	×		
Combination switch	COMB SW			×				
BCM	BCM	×	×			×	×	×
Immobilizer	IMMU		×	×	×			
Interior room lamp battery saver	BATTERY SAVER			×	×			
Trunk	TRUNK			×				
Vehicle security system	THEFT ALM			×	×	×		
RAP system	RETAINED PWR			×				
Signal buffer system	SIGNAL BUFFER			×	×			
TPMS	AIR PRESSURE MONITOR		×	×	×			

FREEZE FRAME DATA (FFD)

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

CONSULT screen item	Indication/Unit	Description	
Vehicle Speed	km/h	Vehicle speed at the moment a particular DTC is detected	
Odo/Trip Meter	km	Total mileage (Odometer value) at the moment a particular DTC is detected	
Vehicle Condition	SLEEP>LOCK	Power position status at 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 stopped and selector lever is in 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)*
	OFF		Power supply position is “OFF” (Ignition switch OFF)
	ACC		Power supply position is “ACC” (Ignition switch ACC)
	ON		Power supply position is “IGN” (Ignition switch ON with engine stopped)
	ENGINE RUN		Power supply position is “RUN” (Ignition switch ON with engine running)
	CRANKING		Power supply position is “CRANKING” (At engine cranking)
IGN Counter	0 - 39	The number of times that ignition switch is turned ON after DTC is detected • The number is 0 when a malfunction is detected now. • The number increases like 1 → 2 → 3...38 → 39 after returning to the normal condition whenever ignition is switched OFF → ON. • The number is fixed to 39 until the self-diagnosis results are erased if it is over 39.	

NOTE:
*: Power supply position shifts to “LOCK” from “OFF”, when ignition switch is in the OFF position, selector lever is in the P position, and any of the following conditions are met:
- Closing door
- Opening door
- Door is locked using door request switch
- Door is locked using Intelligent Key

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

WIPER

WIPER : CONSULT Function (BCM - WIPER)

INFOID:0000000012193921

DATA MONITOR

Monitor Item [Unit]	Description
PUSH SW [On/Off]	Indicates condition of push button ignition switch
VEH SPEED 1 [km/h]	Indicates vehicle speed signal received from ABS on CAN communication line
FR WIPER HI [On/Off]	Indicates condition of wiper operation of combination switch
FR WIPER LOW [On/Off]	
FR WASHER SW [On/Off]	
FR WIPER INT [On/Off]	
FR WIPER STOP [On/Off]	Indicates front wiper auto stop signal received from IPDM E/R on CAN communication line
INT VOLUME [1 – 7]	Indicates condition of intermittent wiper operation of combination switch
RAIN SENSOR [On/Off]	Indicates condition of rain sensor.

ACTIVE TEST

Test Item	Description
FR WIPER	This test is able to check front wiper operation [INT/Lo/Hi/Off].

WORK SUPPORT

Support Item	Setting	Description
RAIN SENSOR	On*	Rain sensor function ON.
	Off	Rain sensor function OFF
WIPER SPEED SETTING	On*	Wiper speed setting function ON.
	Off	Wiper speed setting function OFF.

* : Initial setting

DIAGNOSIS SYSTEM (IPDM E/R)

Diagnosis Description

INFOID:0000000012193923

AUTO ACTIVE TEST

Description

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

- Front wiper (LO, HI)
- Front fog lamps
- Parking lamps
- Side marker lamps
- Tail lamps
- License plate lamps
- Daytime running lamps
- Headlamps (LO, HI)
- A/C compressor (magnet clutch)
- Cooling fans (LO, HI)

Operation Procedure

CAUTION:

Do not start the engine.

NOTE:

When auto active test is performed with hood opened, sprinkle water on windshield beforehand.

NOTE:

- If auto active test mode cannot be actuated, check door switch system. Refer to DLK-98, "Component Function Check".
- When auto active test mode has to be canceled halfway through test, turn ignition switch OFF.

1. Close the hood and lift the wiper arms from the windshield (to prevent windshield damage due to wiper operation).
2. Turn ignition switch OFF.
3. Turn the ignition switch ON, and within 20 seconds, press the front door switch LH 10 times. Then turn the ignition switch OFF.
4. Turn the ignition switch ON within 10 seconds. After that, the horn sounds once and the auto active test starts.
5. After a series of the following operations is repeated 3 times, auto active test is completed.

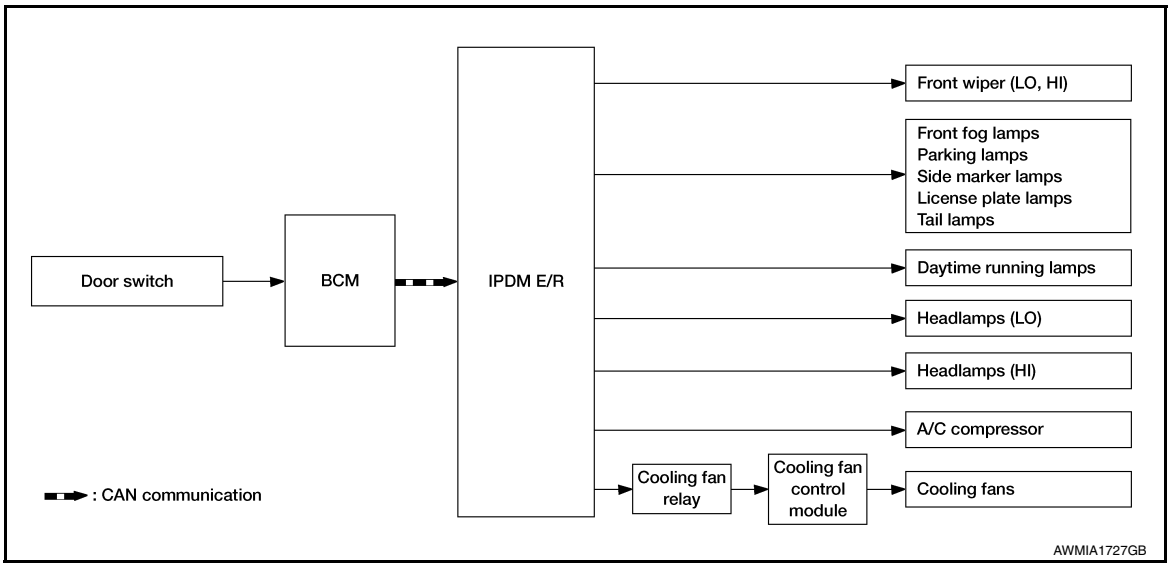
Inspection in Auto Active Test Mode

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

Operation sequence	Inspection Location	Operation
1	Front wiper	LO for 3 seconds → HI for 3 seconds
2	• Front fog lamps • Parking lamps • Side marker lamps • Tail lamps • License plate lamps	10 seconds
3	Daytime running lamps	10 seconds
4	Headlamps	LO ⇔ HI 5 times
5	A/C compressor	ON ⇔ OFF 5 times
6*	Cooling fans	LO for 5 seconds → HI for 5 seconds

*: Outputs duty ratio of 50% for 5 seconds → duty ratio of 100% for 5 seconds on the cooling fan control module.

Concept of auto active test



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

Diagnosis chart in auto active test mode

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

Symptom	Inspection contents		Possible cause
Cooling fans do not operate.	Perform auto active test. Do the cooling fans operate?	YES	• ECM signal input circuit • CAN communication signal between ECM and IPDM E/R
		NO	• Cooling fans • Harness or connectors between cooling fans and cooling fan control module • Cooling fan control module • Harness or connectors between cooling fan relay and cooling fan control module • Cooling fan relay • Harness or connectors between IPDM E/R and cooling fan relay • IPDM E/R

CONSULT Function (IPDM E/R)

INFOID:0000000012193924

APPLICATION ITEM

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

Direct Diagnostic Mode	Description
ECU Identification	The IPDM E/R part number is displayed.
Self Diagnostic Result	The IPDM E/R self diagnostic results are displayed.
Data Monitor	The IPDM E/R input/output data is displayed in real time.
Active Test	The IPDM E/R activates outputs to test components.
CAN Diag Support Mntr	The result of transmit/receive diagnosis of CAN communication is displayed.

ECU IDENTIFICATION

The IPDM E/R part number is displayed.

SELF DIAGNOSTIC RESULT

Refer to PCS-21, "DTC Index".

DATA MONITOR

Monitor Item [Unit]	Main Signals	Description
MOTOR FAN REQ [1/2/3/4]	×	Indicates cooling fan speed signal received from ECM on CAN communication line
AC COMP REQ [On/Off]	×	Indicates A/C compressor request signal received from ECM on CAN communication line
TAIL&CLR REQ [On/Off]	×	Indicates position light request signal received from BCM on CAN communication line
HL LO REQ [On/Off]	×	Indicates low beam request signal received from BCM on CAN communication line
HL HI REQ [On/Off]	×	Indicates high beam request signal received from BCM on CAN communication line
FR FOG REQ [On/Off]	×	Indicates front fog light request signal received from BCM on CAN communication line
FR WIP REQ [Stop/1LOW/Low/Hi]	×	Indicates front wiper request signal received from BCM on CAN communication line
WIP AUTO STOP [STOP P/ACT P]	×	Indicates condition of front wiper auto stop signal
WIP PROT [Off/BLOCK]	×	Indicates condition of front wiper fail-safe operation

Monitor Item [Unit]	Main Signals	Description
IGN RLY1 -REQ [On/Off]		Indicates ignition switch ON signal received from BCM on CAN communication line
IGN RLY [On/Off]	×	Indicates condition of ignition relay-1
PUSH SW [On/Off]		Indicates condition of push-button ignition switch
INTER/NP SW [On/Off]		Indicates condition of CVT shift position
ST RLY CONT [On/Off]		Indicates starter relay status signal received from BCM on CAN communication line
IHBT RLY -REQ [On/Off]		Indicates starter control relay signal received from BCM on CAN communication line
ST/INHI RLY [Off/ ST /INHI]		Indicates condition of starter relay and starter control relay
DETENT SW [On/Off]		Indicates condition of CVT shift selector (park position switch)
DTRL REQ [Off]		Indicates daytime running light request signal received from BCM on CAN communication line
HOOD SWITCH		Indicates condition of hood switch
THFT HRN REQ [On/Off]		Indicates theft warning horn request signal received from BCM on CAN communication line
HORN CHIRP [On/Off]		Indicates horn reminder signal received from BCM on CAN communication line
HOOD SWITCH 2		Indicates condition of hood switch 2

ACTIVE TEST

Test item	Description
HORN	This test is able to check horn operation [On].
FRONT WIPER	This test is able to check wiper motor operation [Hi/Lo/Off].
MOTOR FAN	This test is able to check cooling fan operation [4/3/2/1].
EXTERNAL LAMPS	This test is able to check external lamp operation [Fog/Hi/Lo/Tail/Off].

CAN DIAG SUPPORT MNTR

Refer to LAN-14, "CAN Diagnostic Support Monitor".

ECU DIAGNOSIS INFORMATION

BCM, IPDM E/R

List of ECU Reference

INFOID:0000000012157325

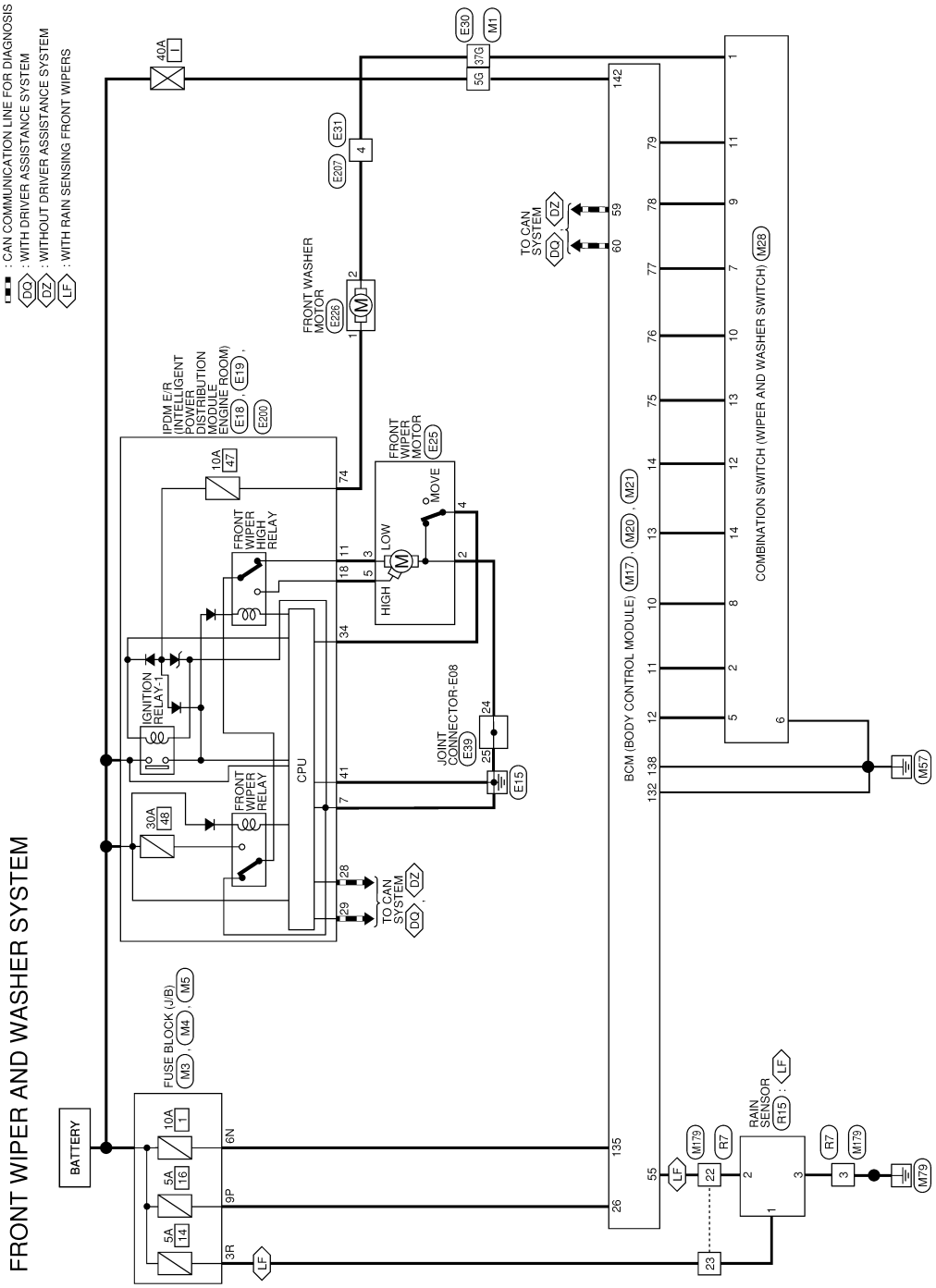
ECU	Reference
BCM	BCS-31, "Reference Value"
	BCS-51, "Fail Safe"
	BCS-52, "DTC Inspection Priority Chart"
	BCS-53, "DTC Index"
IPDM E/R	PCS-13, "Reference Value"
	PCS-20, "Fail Safe"
	PCS-21, "DTC Index"

WIRING DIAGRAM

WIPER AND WASHER SYSTEM

Wiring Diagram

INFOID:0000000012193018



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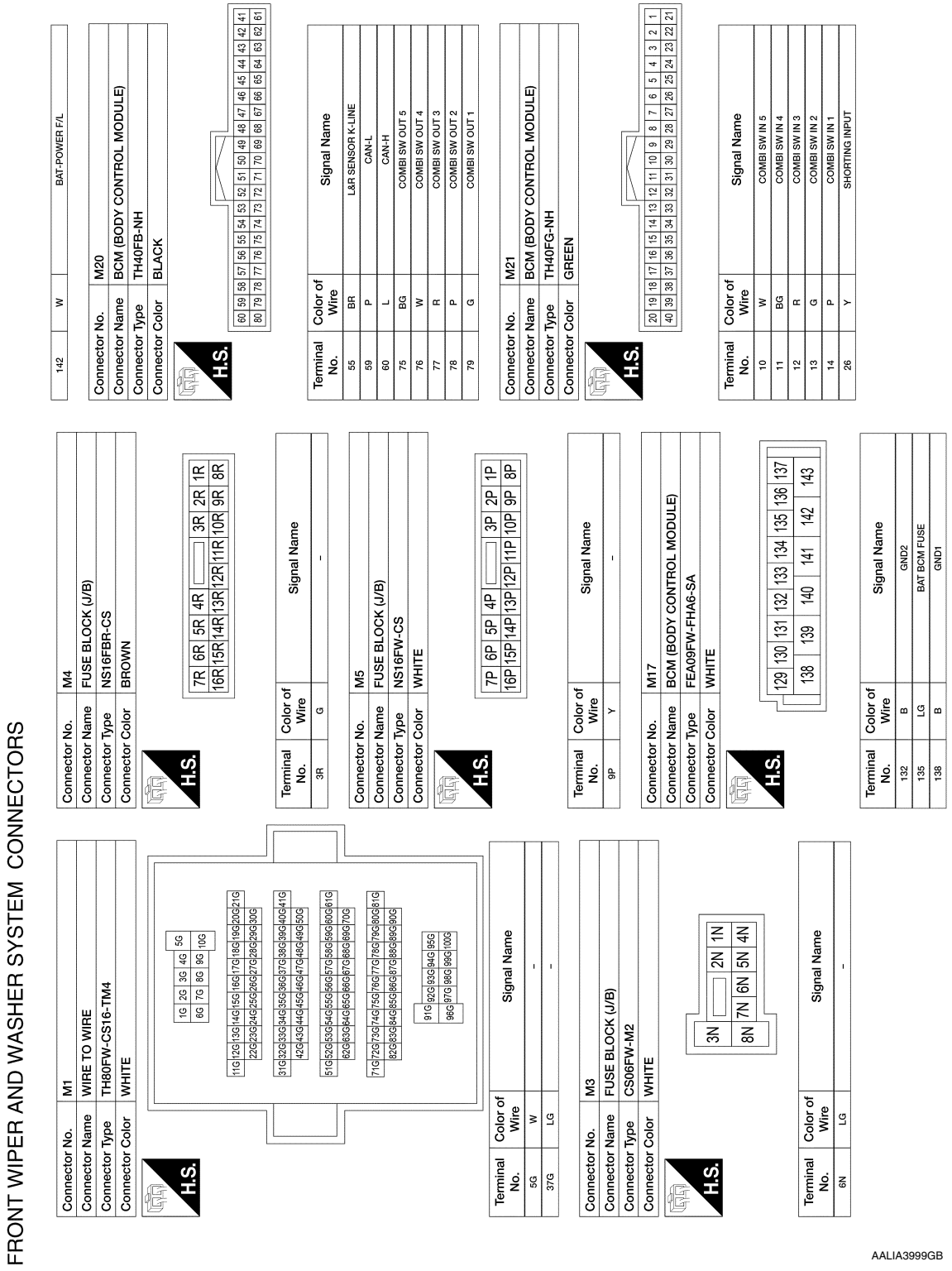
FRONT WIPER AND WASHER SYSTEM CONNECTORS



AALIA3999GB

Connector No.	M28
Connector Name	COMBINATION SWITCH (LIGHTING AND TURN SIGNAL SWITCH)
Connector Type	TH16FW-NH
Connector Color	WHITE

H.S.

1	2				5	6
7	8	9	10	11	12	13	14

Terminal No.	Color of Wire	Signal Name
1	LG	–
2	BG	–
5	R	–
6	B	–
7	R	–
8	W	–
9	P	–
10	W	–
11	G	–
12	P	–
13	BG	–
14	G	–

Connector No.	M179
Connector Name	WIRE TO WIRE
Connector Type	TH24MW-NH
Connector Color	WHITE

H.S.

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24

Terminal No.	Color of Wire	Signal Name
3	B	–
22	BR	–
23	G	–

Connector No.	E18
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS12FW-CS
Connector Color	WHITE

H.S.

7	8		9	10	11
12	13	14	15	16	17	18

Terminal No.	Color of Wire	Signal Name
7	B	P-GND
11	G	FR WIPER LO
18	P	FR WIPER HI

Connector No.	E19
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH32FW-NH
Connector Color	WHITE

H.S.

19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50

Terminal No.	Color of Wire	Signal Name
28	P	CAN-L
29	L	CAN-H
34	SB	WIPER AUTOSTOP
41	B	S-GND

Connector No.	E25
Connector Name	FRONT WIPER MOTOR
Connector Type	HS05FGY
Connector Color	GRAY

H.S.

3	2	1
5		4

Terminal No.	Color of Wire	Signal Name
2	GR	–
3	G	–
4	SB	–
5	P	–

Connector No.	E30
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4
Connector Color	WHITE

H.S.

															5G	4G	3G	2G	1G
															10G	9G	8G	7G	6G
21G	20G	19G	18G	17G	16G	15G	14G	13G	12G	11G									
30G	29G	28G	27G	26G	25G	24G	23G	22G											
41G	40G	39G	38G	37G	36G	35G	34G	33G	32G	31G									
50G	49G	48G	47G	46G	45G	44G	43G	42G											
61G	60G	59G	58G	57G	56G	55G	54G	53G	52G	51G									
70G	69G	68G	67G	66G	65G	64G	63G	62G											
81G	80G	79G	78G	77G	76G	75G	74G	73G	72G	71G									
90G	89G	88G	87G	86G	85G	84G	83G	82G											
															95G	94G	93G	92G	91G
															100G	99G	98G	97G	96G

Terminal No.	Color of Wire	Signal Name
5G	P	–
37G	LG	–

AALIA4000GB

Connector No.	E31
Connector Name	WIRE TO WIRE
Connector Type	NS08MW-CS
Connector Color	WHITE

H.S.

1	2		3
4	5	6	7	8

Terminal No.	Color of Wire	Signal Name
4	LG	–

Connector No.	E207
Connector Name	WIRE TO WIRE
Connector Type	NS08FW-CS
Connector Color	WHITE

H.S.

3		2	1
8	7	6	5	4

Terminal No.	Color of Wire	Signal Name
4	LG	–

Connector No.	R15
Connector Name	RAIN SENSOR
Connector Type	AAB03FB-X
Connector Color	BLACK

H.S.

1	2	3

Terminal No.	Color of Wire	Signal Name
1	SB	–
2	BR	–
3	B	–

Connector No.	E39
Connector Name	JOINT CONNECTOR-E08
Connector Type	BJ30FW
Connector Color	WHITE

H.S.

11	10	9	8	7	6	5	4	3	2	1
22	21	20	19	18	17	16	15	14	13	12
33	32	31	30	29	28	27	26	25	24	23

Terminal No.	Color of Wire	Signal Name
24	GR	–
25	GR	–

Connector No.	E226
Connector Name	FRONT WASHER MOTOR
Connector Type	PEY02FB
Connector Color	BLACK

H.S.

2	1

Terminal No.	Color of Wire	Signal Name
1	V	–
2	LG	–

Connector No.	R7
Connector Name	WIRE TO WIRE
Connector Type	TH24FW-NH
Connector Color	WHITE

H.S.

12	11	10	9	8	7	6	5	4	3	2	1
24	23	22	21	20	19	18	17	16	15	14	13

Terminal No.	Color of Wire	Signal Name
3	B	–
22	SB	–
23	BR	–

Connector No.	E200
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS08FW-CS
Connector Color	WHITE

H.S.

74		75	76
77	78	79	80	81

Terminal No.	Color of Wire	Signal Name
74	V	WASH MTR

AALIA4001GB

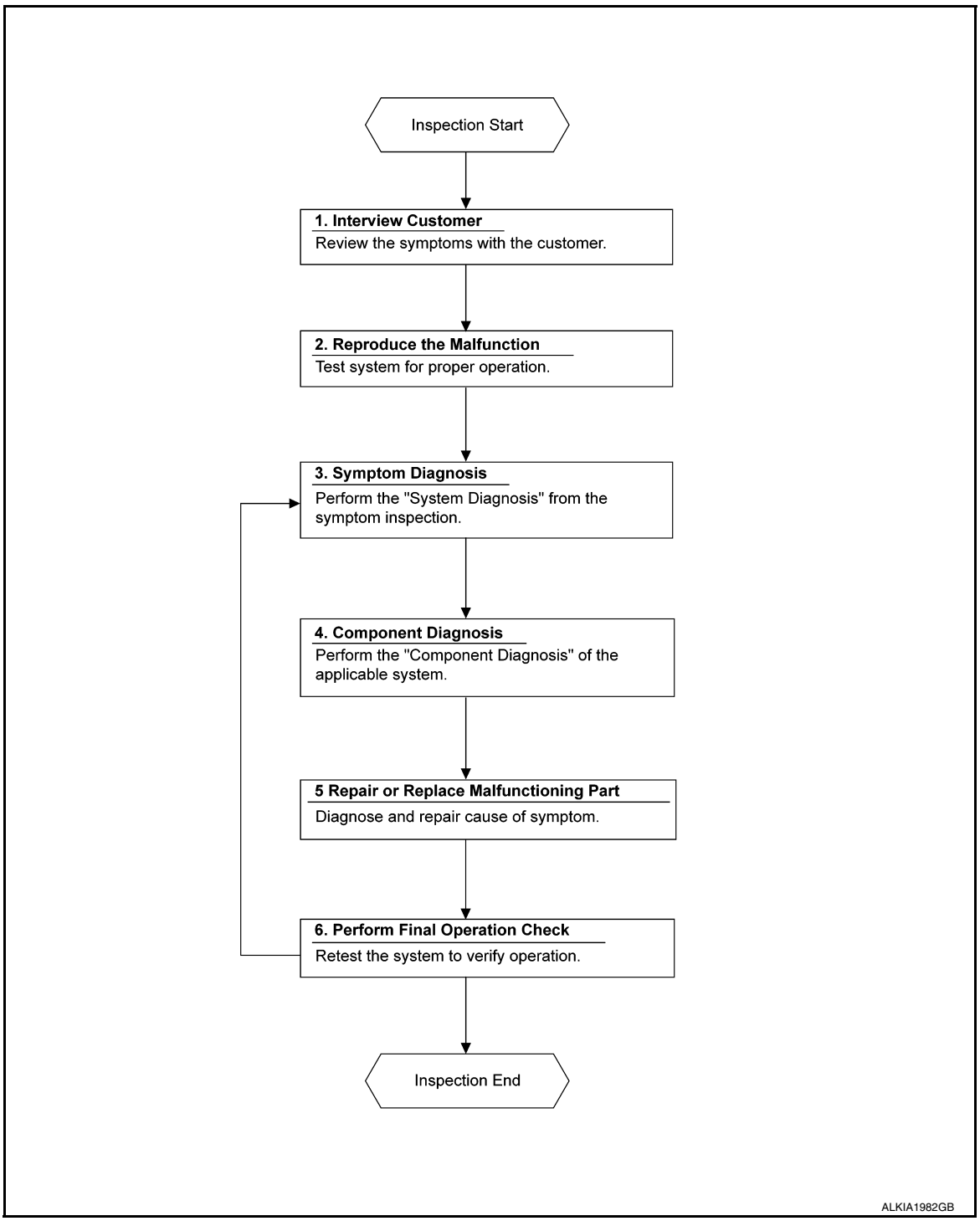
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000012157327

OVERALL SEQUENCE



DETAILED FLOW

1. INTERVIEW CUSTOMER

Interview the customer to obtain as much information as possible about the conditions and environment under which the malfunction occurred.

>> GO TO 2.

2. REPRODUCE THE MALFUNCTION

Reproduce the malfunction on the vehicle that the customer describes.
Inspect the relation of the symptoms and the condition when the symptoms occur.

>> GO TO 3.

3. SYMPTOM DIAGNOSIS

Use Symptom diagnosis from the symptom inspection result in step 2 and then identify where to start performing the diagnosis based on possible causes and symptoms.

>> GO TO 4.

4. COMPONENT DIAGNOSIS

Perform the diagnosis with Component diagnosis of the applicable system.

>> GO TO 5.

5. REPAIR OR REPLACE THE MALFUNCTIONING PART

Repair or replace the specified malfunctioning parts.

>> GO TO 6.

6. PERFORM FINAL OPERATIONAL CHECK

Check that malfunctions are not reproduced when obtaining the malfunction information from the customer, referring to the symptom inspection result in step 2.

Are the malfunctions corrected?

YES >> Inspection End.
NO >> GO TO 3.

DTC/CIRCUIT DIAGNOSIS

WIPER AND WASHER FUSE

Diagnosis Procedure

INFOID:0000000012157328

1. CHECK FUSES

Check that the following fuses are not blown:

Component	Capacity	Fuse No.	Location
Front wiper motor	30A	48	IPDM E/R
Front washer motor	10A	47	

Is the fuse blown?

YES >> Replace the blown fuse after repairing the affected circuit.
NO >> Inspection End.

FRONT WIPER MOTOR LO CIRCUIT

Component Function Check

INFOID:0000000012157329

1.CHECK FRONT WIPER LO OPERATION

CONSULT
1. Select ""FRONT WIPER" in "Active Test" mode of "IPDM E/R".
2. While operating the test item, check front wiper operation.

Lo : Front wiper (LO) operation
Off : Stop the front wiper.

Is front wiper (LO) operation normal?

YES >> Front wiper motor LO circuit is normal.
NO >> Refer to WW-30, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000012157330

Regarding Wiring Diagram information, refer to WW-23, "Wiring Diagram".

1.CHECK FRONT WIPER MOTOR (LO) OUTPUT VOLTAGE

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

(+)		(–)	Condition		Voltage (Approx.)
Front wiper motor					
Connector	Terminal				
E25	3	Ground	FRONT WIPER	Lo	Battery voltage
				Off	0 V

Is the inspection result normal?

YES >> Replace front wiper motor. Refer to WW-52, "Removal and Installation".
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	
E18	11	E25	3	Yes

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

IPDM E/R		—	Continuity
Connector	Terminal		
E18	11	Ground	No

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-36, "Removal and Installation".

NO >> Repair or replace harness.

FRONT WIPER MOTOR HI CIRCUIT

Component Function Check

INFOID:0000000012157331

1.CHECK FRONT WIPER HI OPERATION

CONSULT
1. Select “FRONT WIPER” in “Active Test” mode of “IPDM E/R”.
2. While operating the test item, check front wiper operation.

Hi : Front wiper (HI) operation
Off : Stop the front wiper.

Is front wiper (HI) operation normal?

YES >> Front wiper motor HI circuit is normal.
NO >> Refer to WW-32, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000012157332

Regarding Wiring Diagram information, refer to WW-23, "Wiring Diagram".

1.CHECK FRONT WIPER MOTOR (HI) OUTPUT VOLTAGE

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

(+)		(–)	Condition		Voltage (Approx.)
Front wiper motor					
Connector	Terminal				
E25	5	Ground	FRONT WIPER	Hi	Battery voltage
				Off	0 V

Is the inspection result normal?

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

2.CHECK FRONT WIPER MOTOR (HI) CIRCUIT

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

IPDM E/R		Front wiper motor		Continuity
Connector	Terminal	Connector	Terminal	
E18	18	E25	5	Yes

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

IPDM E/R		—	Continuity
Connector	Terminal		
E18	18	Ground	No

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-36, "Removal and Installation".

NO >> Repair or replace harness.

FRONT WIPER STOP POSITION SIGNAL CIRCUIT

Component Function Check

INFOID:0000000012157333

1.CHECK FRONT WIPER STOP POSITION SIGNAL

CONSULT
1. Select “WIP AUTO STOP” in “Data Monitor” mode of “IPDM E/R”.
2. Operate the front wiper.
3. Check that the function operates normally according to the following conditions:

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-34, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000012157334

Regarding Wiring Diagram information, refer to WW-23, "Wiring Diagram".

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		
E25	4	Ground	Battery voltage

Is the inspection result normal?

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

2.CHECK FRONT WIPER MOTOR CIRCUIT

1. Turn 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	
E19	34	E25	4	Yes

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

IPDM E/R		—	Continuity
Connector	Terminal		
E19	34	Ground	No

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-36, "Removal and Installation".
NO >> Repair or replace harness.

FRONT WIPER MOTOR GROUND CIRCUIT

Diagnosis Procedure

INFOID:0000000012157335

Regarding Wiring Diagram information, refer to WW-23, "Wiring Diagram".

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		—	Continuity
Connector	Terminal		
E25	2	Ground	Yes

Is the inspection result normal?

YES >> Inspection End.
NO >> Repair or replace harness.

WASHER MOTOR CIRCUIT

Diagnosis Procedure

INFOID:0000000012157336

Regarding Wiring Diagram information, refer to WW-23, "Wiring Diagram"

1. CHECK FRONT WASHER MOTOR FUSE

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

Component	Capacity	Fuse No.	Location
Front washer motor	10A	47	IPDM E/R

Is the fuse blown?

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

2. CHECK FRONT WASHER MOTOR POWER SUPPLY

1. Disconnect the front washer motor.
2. Turn ignition switch ON.
3. Check voltage between front washer motor harness connector and ground.

(+)		(-)	Washer switch	Voltage (Approx.)
Front washer motor		Ground		
Connector	Terminal			
E226	1		ON	Battery voltage
			OFF	0 V

Is the inspection result normal?

YES >> Inspection End.
NO >> GO TO 3.

3. CHECK WASHER SWITCH

Check washer switch. Refer to WW-59, "Exploded View".

Is the inspection result normal?

YES >> Repair harness between fuse and the front washer motor.
NO >> Replace washer switch. Refer to WW-59, "Exploded View".

RAIN SENSOR

Component Function Check

INFOID:0000000012193069

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 the inspection result normal?

YES >> Rain sensor circuit is normal.
NO >> Refer to WW-37, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000012193070

Regarding Wiring Diagram information, refer to WW-23, "Wiring Diagram".

1.CHECK RAIN SENSOR FUSE

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

Component	Location	Fuse No.	Capacity
Rain sensor	Fuse block (J/B)	14	5A

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace the blown 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		
R15	1	Ground	Battery voltage

Is the inspection result normal?

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

3.CHECK RAIN SENSOR GROUND CIRCUIT

Check continuity between rain sensor harness connector and ground.

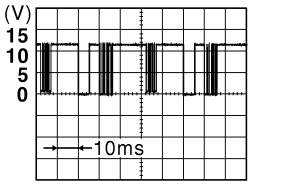
Rain sensor		–	Continuity
Connector	Terminal		
R15	3	Ground	Yes

Is the inspection result normal?

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

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			
M20	55	Ground	Ignition switch ON	 JPMIA0156GB Approx. 8.7V

Is the inspection result normal?

YES >> Replace rain sensor. Refer to WW-57, "Removal and Installation".
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	
M20	55	R15	2	Yes

Is the inspection result normal?

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

6.CHECK RAIN SENSOR SIGNAL CIRCUIT FOR SHORT

Check continuity between BCM harness connector and ground.

BCM		–	Continuity
Connector	Terminal		
M20	55	Ground	No

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-82, "Removal and Installation".
NO >> Repair or replace the harness connectors.

WASHER SWITCH

Component Inspection

INFOID:0000000012157337

1. CHECK WASHER SWITCH (WIPER AND WASHER SWITCH)

1. Turn ignition switch OFF.
2. Disconnect combination switch (wiper and washer switch) connector.
3. Check continuity between the combination switch (wiper and washer switch) terminals.

Combination switch (wiper and washer switch)		Condition	Continuity
Terminals			
1	6	Washer switch ON	Yes

Is the inspection result normal?

YES >> Inspection End.
NO >> Replace combination switch (wiper and washer switch). Refer to WW-59, "Exploded View".

SYMPTOM DIAGNOSIS

WIPER AND WASHER SYSTEM SYMPTOMS

Symptom Table

INFOID:0000000012157338

NOTE:
Perform the “Self Diagnostic Result” with CONSULT before the symptom diagnosis. Perform the trouble diagnosis if any DTC is detected.

Symptom		Probable malfunction location	Inspection item
Front wiper does not operate	HI only	• Combination switch (wiper and washer switch) • Harness between combination switch (wiper and washer switch) and BCM • BCM	Combination switch (wiper and washer switch) Refer to BCS-80, "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-32, "Component Function Check".
		Front wiper request signal • BCM • IPDM E/R	IPDM E/R “Data Monitor”“FR WIP REQ”
	LO and INT	• IPDM E/R • Harness between IPDM E/R and front wiper motor • Front wiper motor	Front wiper motor (LO) circuit Refer to WW-30, "Component Function Check".
	LO only	• Combination switch (wiper and washer switch) • Harness between combination switch and BCM • BCM	Combination switch (wiper and washer switch) Refer to BCS-80, "Symptom Table".
		Front wiper request signal • BCM • IPDM E/R	IPDM E/R “Data Monitor”“FR WIP REQ”
	INT only	• Combination switch (wiper and washer switch) • Harness between combination switch (wiper and washer switch) and BCM • BCM	Combination switch (wiper and washer switch) Refer to BCS-80, "Symptom Table".
		Front wiper request signal • BCM • IPDM E/R	IPDM E/R “Data Monitor”“FR WIP REQ”
	HI, LO and INT	SYMPTOM DIAGNOSIS Refer to WW-30, "Diagnosis Procedure".	

Symptom		Probable malfunction location	Inspection item
Front wiper does not stop	HI only	• Combination switch (wiper and washer switch) • BCM	Combination switch (wiper and washer switch) Refer to BCS-80, "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 (wiper and washer switch) • BCM	Combination switch (wiper and washer switch) Refer to BCS-80, "Symptom Table".
		Front wiper request signal • BCM • IPDM E/R	IPDM E/R "Data Monitor""FR WIP REQ"
		IPDM E/R	—
	INT only	• Combination switch (wiper and washer switch) • BCM	Combination switch (wiper and washer switch) Refer to BCS-80, "Symptom Table".
		Front wiper request signal • BCM • IPDM E/R	IPDM E/R "Data Monitor""FR WIP REQ"
Front wiper does not operate normally	Intermittent adjustment cannot be performed	• Combination switch (wiper and washer switch) • Harness between combination switch and BCM • BCM	Combination switch (wiper and washer switch) Refer to BCS-80, "Symptom Table".
		BCM	—
	Intermittent control linked with vehicle speed cannot be performed	Check the wiper setting is linked with vehicle speed. Refer to BCS-21, "WIPER : CONSULT Function (BCM - WIPER)".	
	Wiper is not linked to the washer operation	• Combination switch (wiper and washer switch) • Harness between combination switch and BCM • BCM	Combination switch (wiper and washer switch) Refer to BCS-80, "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-34, "Component Function Check".

NORMAL OPERATING CONDITION

Description

INFOID:0000000012157339

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.

FRONT WIPER DOES NOT OPERATE

Description

INFOID:0000000012157340

The front wiper does not operate under any operation conditions.

Diagnosis Procedure

INFOID:0000000012157341

Regarding Wiring Diagram information, refer to WW-23, "Wiring Diagram".

1.CHECK WIPER RELAY OPERATION

CONSULT
1. Select “FRONT WIPER” in “Active Test” mode of “IPDM E/R”.
2. While 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

Check that the following IPDM E/R fuse is not blown:

Component	Location	Fuse No.	Capacity
Front wiper motor	IPDM E/R	48	30A

Is the fuse blown?

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

3.CHECK FRONT WIPER MOTOR GROUND CIRCUIT

Check front wiper motor ground circuit. Refer to WW-35, "Diagnosis Procedure".

Is the inspection result normal?

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

4.CHECK FRONT WIPER REQUEST SIGNAL INPUT

CONSULT
1. Select “FR WIP REQ” in “Data Monitor” mode of “IPDM E/R”.
2. Switch the front wiper switch to HI and LO.
3. While operating the front wiper switch, check the status of “FR WIP REQ”.

Monitor item	Condition		Monitor status
FR WIP REQ	Front wiper switch	HI	Hi
		LO	Low
		INT	1Low
		OFF	Stop

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-36, "Removal and Installation".
NO >> GO TO 5.

5.CHECK COMBINATION SWITCH (WIPER AND WASHER SWITCH)

Perform the inspection of the combination switch (wiper and washer switch). Refer to BCS-80, "Symptom Table".

Is combination switch normal?

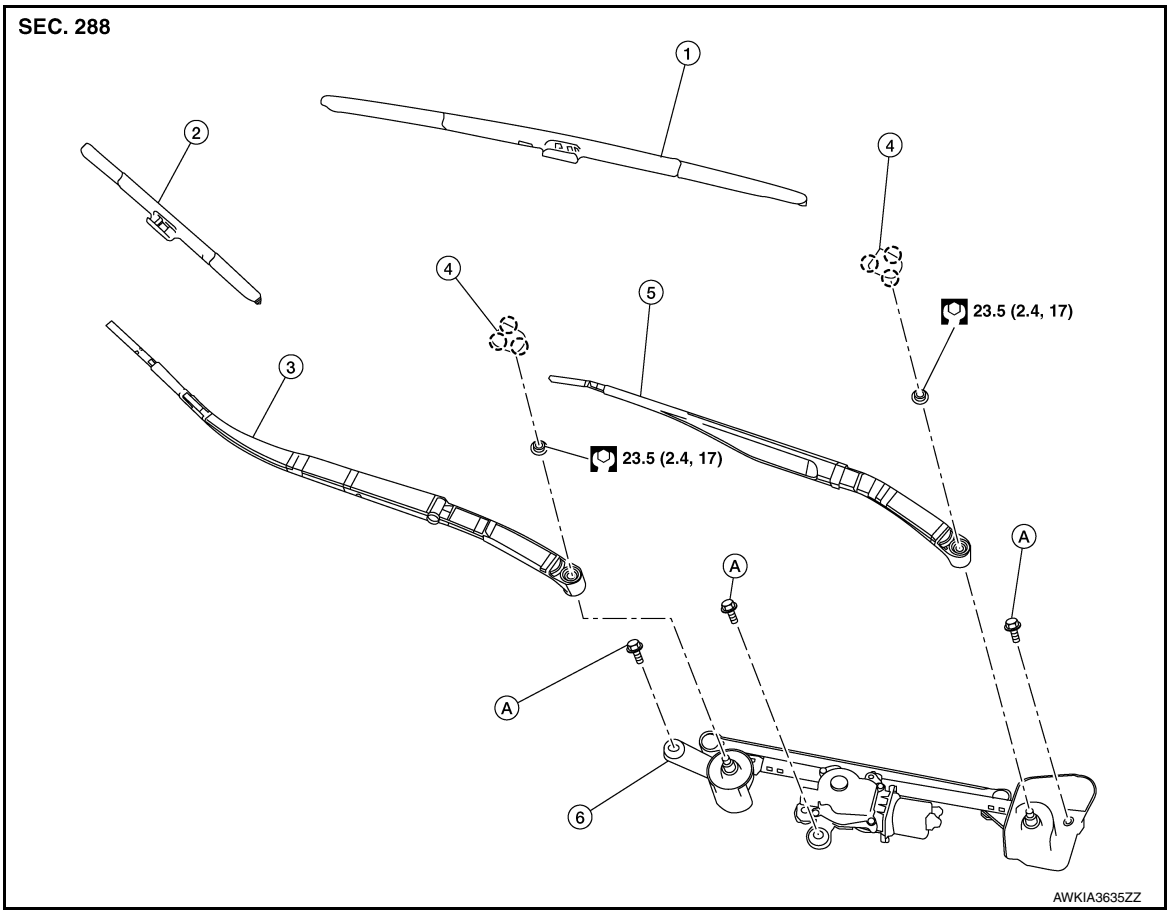
YES >> Replace BCM. Refer to BCS-82, "Removal and Installation".
NO >> Repair or replace the applicable parts.

REMOVAL AND INSTALLATION

FRONT WIPER

Exploded View

INFOID:0000000012157342



1. Wiper blade (LH)
2. Wiper blade (RH)
3. Wiper arm (LH)
4. Wiper arm cover
5. Wiper arm (RH)
6. Wiper drive assembly

A. Refer to INSTALLATION

Pawl

WIPER ARM

WIPER ARM : Removal and Installation

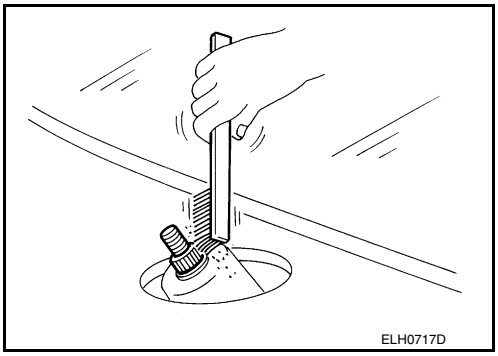
INFOID:0000000012157343

REMOVAL

1. Operate front wiper arms into the auto stop position.
2. Remove front wiper arm cover.
3. Remove front wiper arm nut.
4. Raise front wiper arm, then remove the front wiper arm.

INSTALLATION

1. Clean front wiper arm mount as shown.
   NOTE:
   This will reduce the possibility of wiper arm looseness.



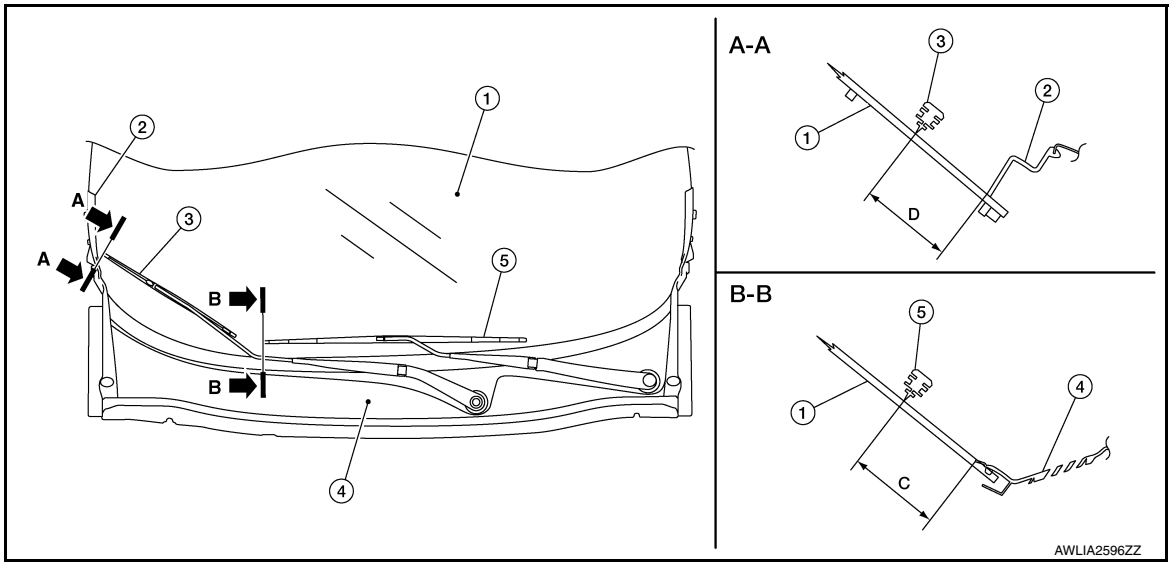
2. Operate front wiper motor to move front wiper to the auto stop position.
3. Adjust front wiper blade position. Refer to WW-46, "WIPER ARM : Adjustment".
4. Install front wiper arm and the front wiper arm nut.
5. Install front wiper arm cover.
6. Check that the front wiper blades stop at the specified position. Refer to WW-46, "WIPER ARM : Adjustment".

WIPER ARM : Adjustment

INFOID:0000000012157344

WIPER BLADE POSITION ADJUSTMENT

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



1. Windshield glass
2. Front fender cover (RH)
3. Front wiper blade (RH)
4. Cowl top cover
5. Front wiper blade (LH)
C. 35.0 mm (1.4 in)
D. 40.2 mm (1.6 in)

WIPER BLADE

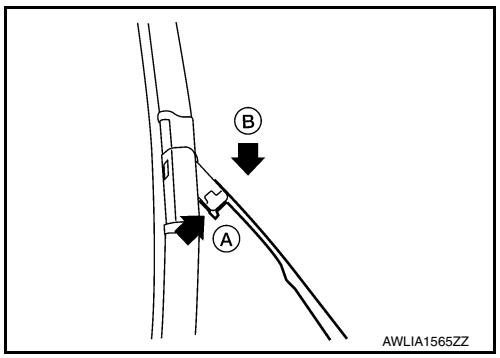
WIPER BLADE : Removal and Installation

INFOID:0000000012157345

REMOVAL

1. Lift wiper arm and wiper blade away from the windshield glass.

2. Rotate wiper blade and push the release tab (A), then move the wiper blade down (B) the wiper arm.
3. Remove wiper blade.
   CAUTION:
   Be careful not to drop the wiper arm onto the windshield glass.



INSTALLATION

CAUTION:

- **Return the wiper arm to the original position on the windshield to prevent damage when the hood is opened.**
- **Check that the wiper blade contacts the windshield properly; otherwise the wiper arm may be damaged from wind pressure while driving.**

1. Insert wiper blade onto the wiper arm and slide it up until it clicks into place.
2. Rotate wiper blade so the dimple is in the groove.
3. Lay wiper arm and wiper blade back down on the windshield.

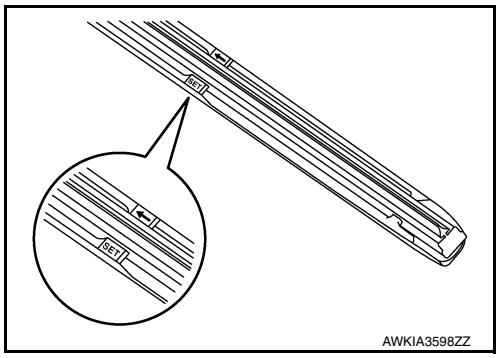
WIPER REFILL

WIPER REFILL : Removal and Installation

INFOID:0000000012157346

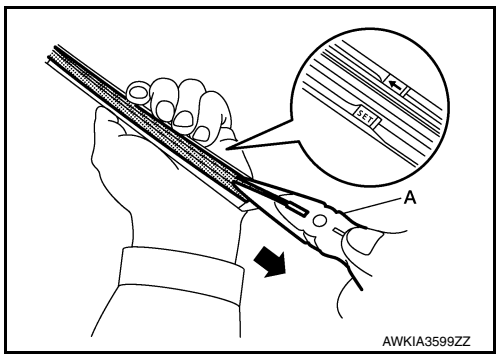
REMOVAL

1. Remove wiper blade. Refer to WW-46, "WIPER BLADE : Removal and Installation".
2. Using suitable tool (A) remove wiper refill.

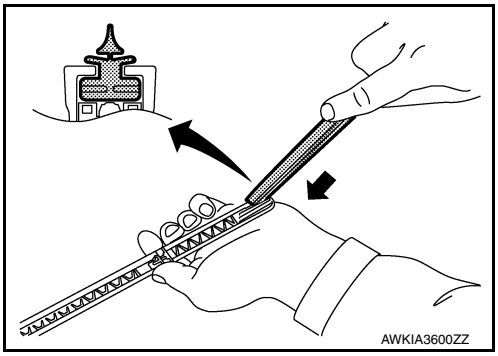


INSTALLATION

1. Check the wiper refill installation direction, by arrow mark on wiper blade tab.

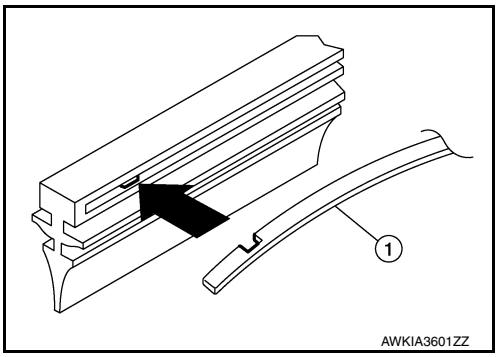


2. Insert wiper refill into the wiper blade tab as shown.



3. Lock wiper refill and wiper blade tab at "SET" mark ("⬅" mark).
4. Check the following items after installing.
   - Wiper refill thoroughly fits in the wiper blade tab.
   - Wiper refill is not deformed.

NOTE:
When the vertebra is detached
- Insert the rib (1) into the wiper blade refill, matching the curve.
- If the rib has a notch, insert the rib so that the notch fits over the protrusion.



5. Install wiper blade. Refer to WW-46, "WIPER BLADE : Removal and Installation"

WIPER DRIVE ASSEMBLY

WIPER DRIVE ASSEMBLY : Removal and Installation

INFOID:0000000012157347

REMOVAL

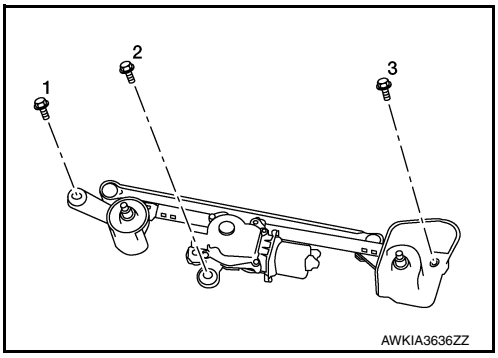
1. Remove cowl top. Refer to EXT-25, "Removal and Installation".
2. Remove strut tower bar. Refer to EXT-24, "Exploded View".
3. Disconnect harness connector from wiper drive assembly.
4. Remove wiper drive assembly bolts.
5. Remove wiper drive assembly.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:
Tighten the bolts to specification in the sequence shown.

Bolts : 4.5 N·m (0.46 kg-m, 40 in-lb)



WIPER MOTOR

WIPER MOTOR : Removal and Installation

INFOID:0000000012157348

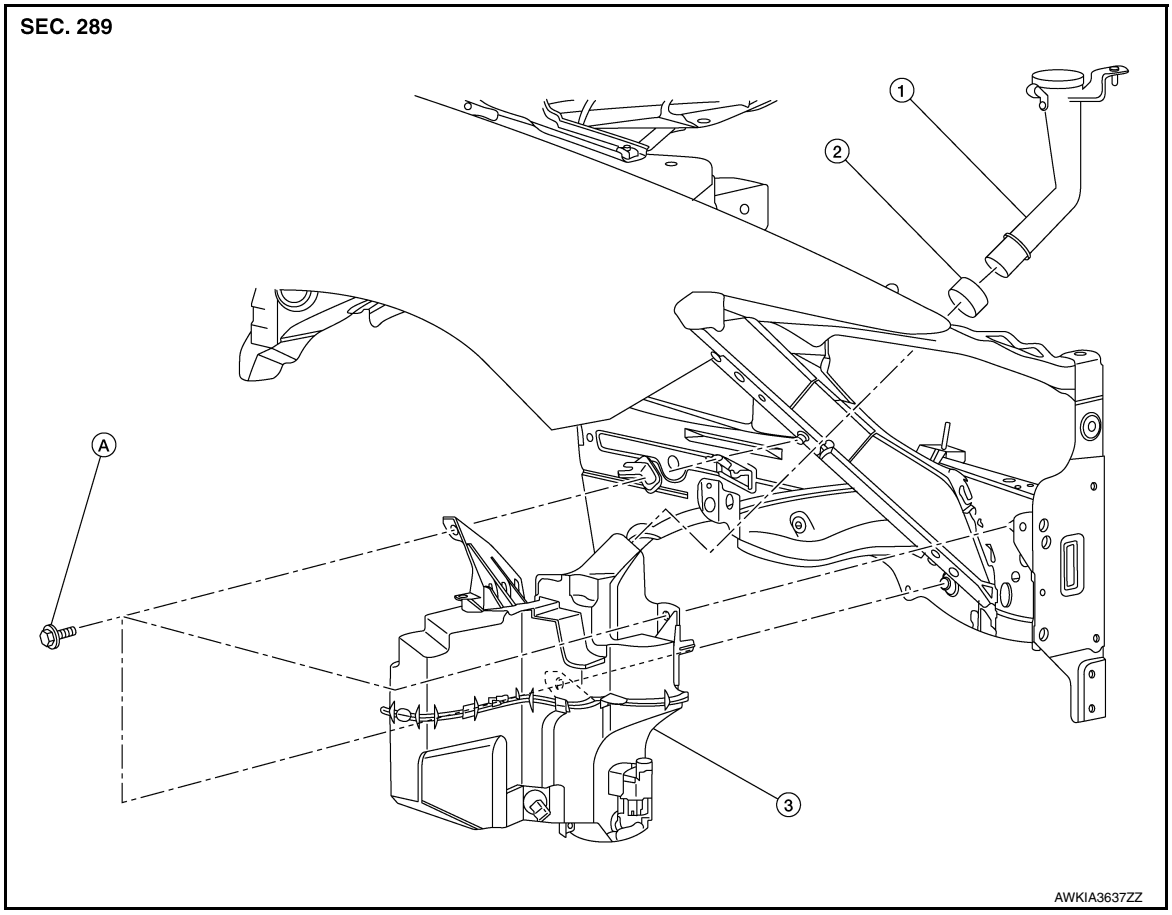
REMOVAL AND INSTALLATION

The wiper motor is serviced as an assembly with the wiper drive assembly. Refer to WW-48, "WIPER DRIVE ASSEMBLY : Removal and Installation"

WASHER TANK

Exploded View

INFOID:0000000012157349



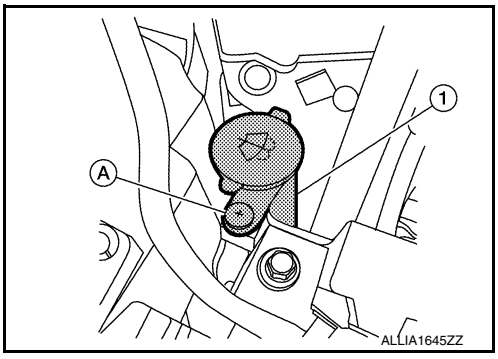
1. Washer tank inlet
2. Seal
3. Washer tank
A. Refer to INSTALLATION

Removal and Installation

INFOID:0000000012157350

REMOVAL

1. Drain washer fluid.
2. Using a suitable tool, remove clip (A) from the radiator core support and remove the washer tank inlet (1) from the washer tank.



3. Remove front under cover. Refer to EXT-26, "Removal and Installation".
4. Remove fender protector (RH). Refer to EXT-28, "Removal and Installation".
5. Disconnect harness connectors from front washer motor and washer fluid level switch.
6. Disconnect front washer tube from front washer motor.

7. Remove washer tank bolts, then remove washer tank.

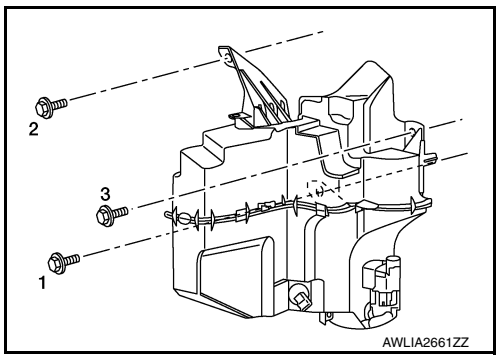
INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Add water up to the top of washer tank inlet after installing. Check that no leaks exist.
Fill washer tank with specified amount of fluid. Refer to WW-60, "Specifications".
Tighten the bolts to specification in the sequence shown.

Bolts : 5.1 N·m (0.52 kg-m, 45 in-lb)



FRONT WASHER MOTOR

Removal and Installation

INFOID:0000000012157352

The front washer motor is serviced as and assembly with the washer tank. Refer to WW-50, "Removal and Installation"

WASHER FLUID LEVEL SWITCH

Removal and Installation

INFOID:0000000012157354

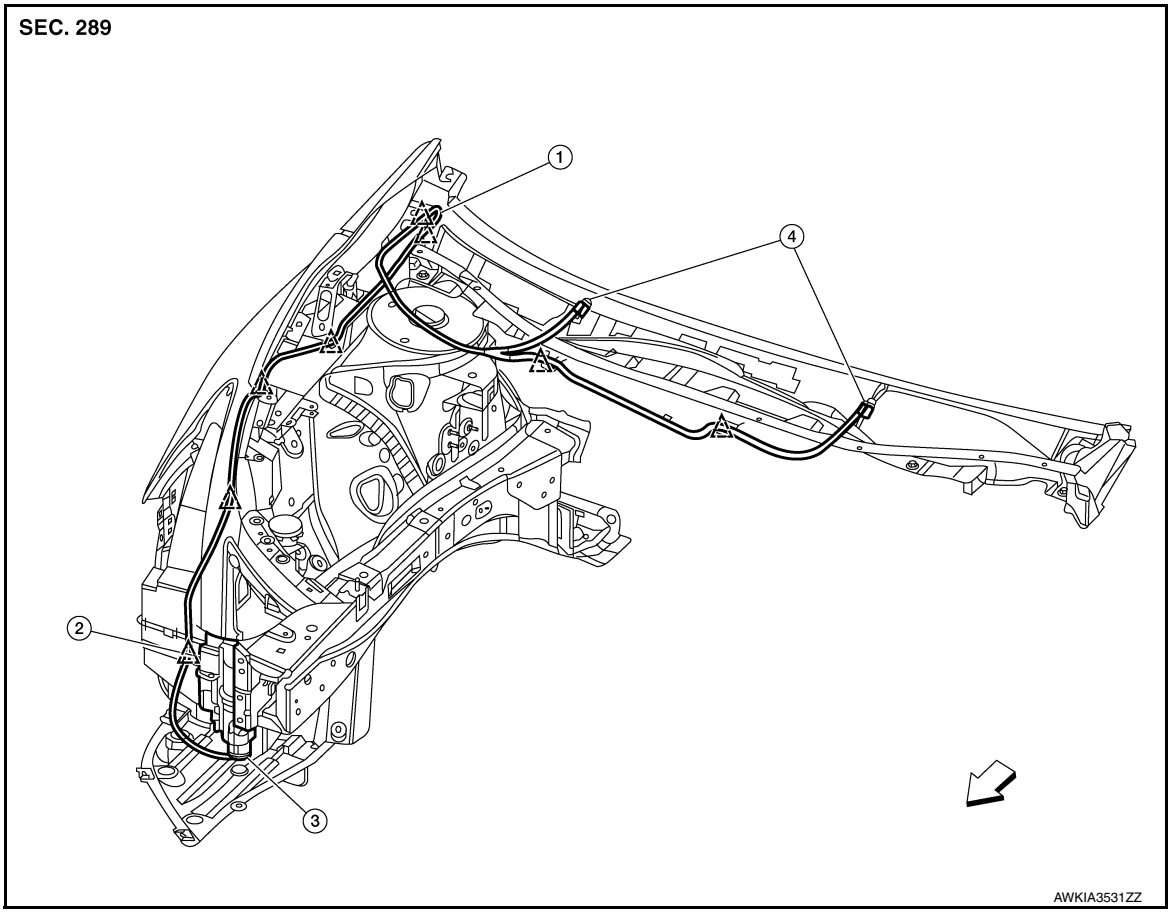
The washer fluid level switch is serviced as an assembly with the washer tank. Refer to WW-50, "Removal and Installation"

WASHER NOZZLE AND TUBE

Exploded View

INFOID:0000000012157355

FRONT



1. Front washer tube
2. Washer tank
3. Washer motor
4. Washer nozzle
⇦ Front
△ Clips

WASHER NOZZLE

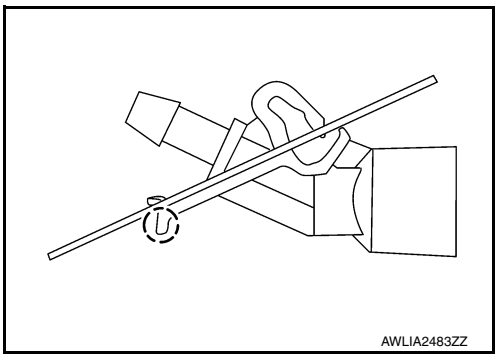
WASHER NOZZLE : Removal and Installation

INFOID:0000000012157357

REMOVAL

1. Release the pawl and remove the front washer nozzle from the hood.

: Pawl



2. Disconnect the front washer tube from the front washer nozzle.

INSTALLATION

Installation is in the reverse order of removal.

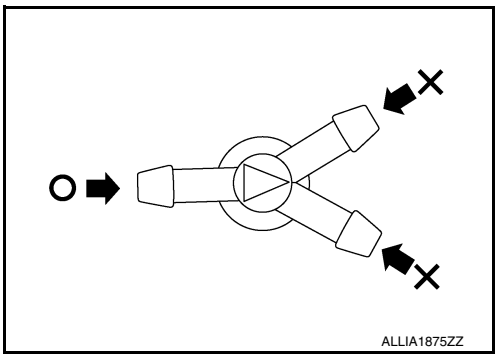
CAUTION:
Adjust the front nozzles to their proper position. Refer to WW-55, "WASHER NOZZLE : Inspection and Adjustment".

WASHER NOZZLE : Inspection and Adjustment

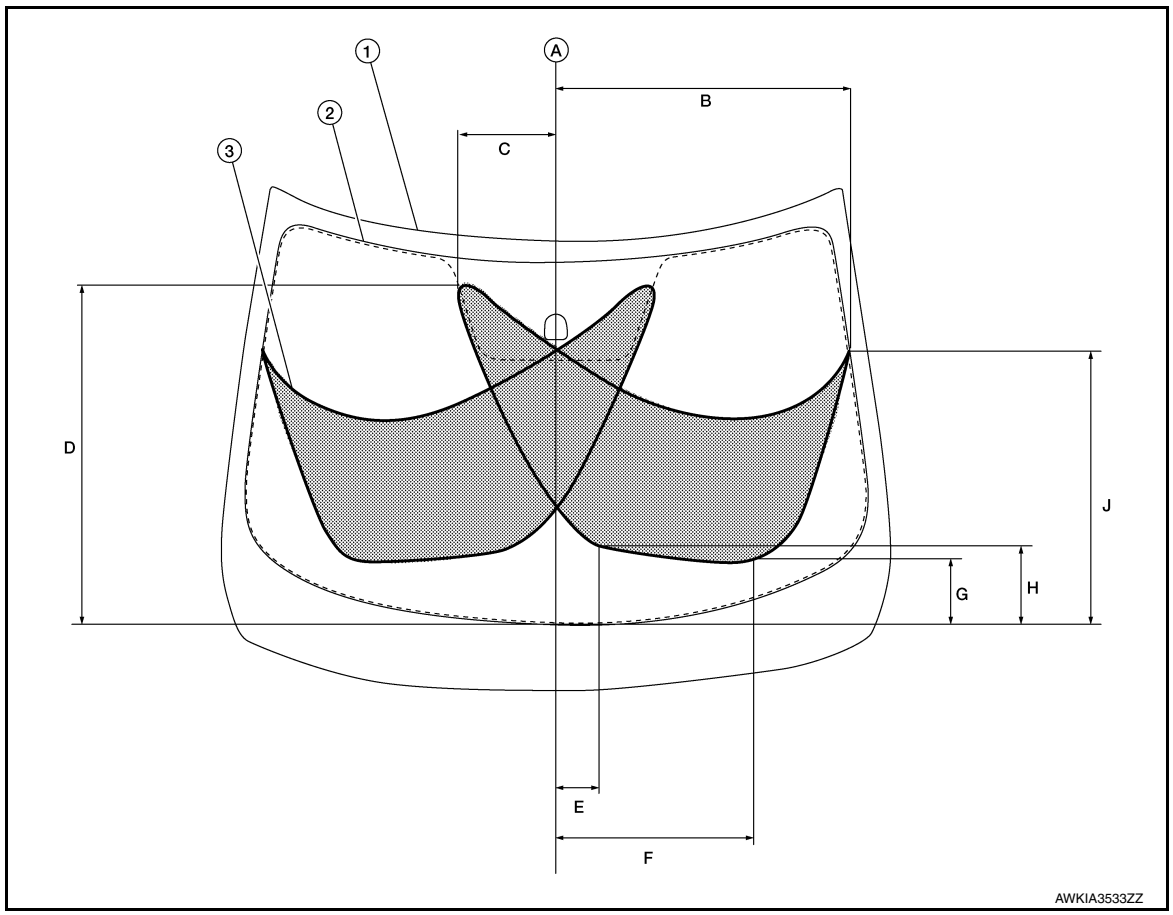
INFOID:0000000012157358

INSPECTION

Check that air can pass through the check valve splitter by blowing into the check valve splitter and that air cannot flow in the opposite direction.
O: Air can flow
X: Air cannot flow



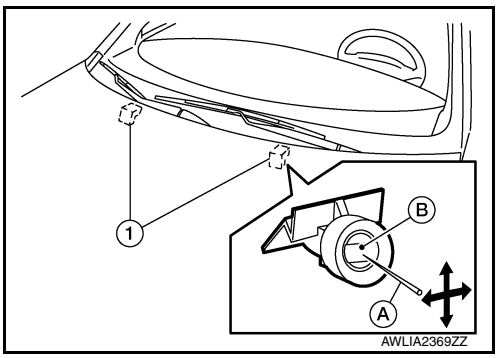
ADJUSTMENT



1. Windshield glass
2. Black printed area line
3. Wiping area
A. Center line
B. 630mm (24.8in)
C. 210mm (8.3in)
D. 580mm (22.8in)
E. 73mm (2.9in)
F. 424mm (16.7in)
G. 133mm (5.2in)
H. 167mm (6.6in)
J. 580mm (22.8in)

NOTE:
Spray positions for LH shown; RH is symmetrical.

Insert a suitable tool (A) into the nozzle hole (B) and move up/down and left/right to adjust the spray position of each nozzle (1).



WASHER TUBE

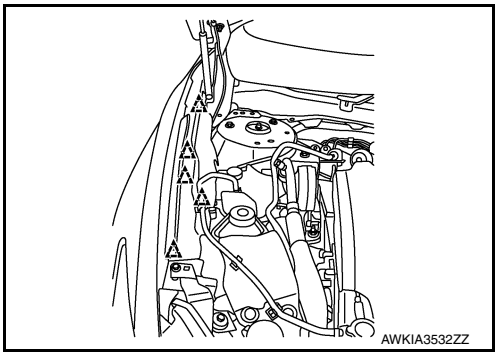
WASHER TUBE : Removal and Installation

INFOID:0000000012219087

REMOVAL

1. Drain washer fluid.
2. Remove clips using suitable tool and hood ledge finisher (RH).

: Clip



3. Remove hood insulator. Refer to DLK-158, "Exploded View".
4. Disconnect washer tube from washer nozzles (LH/RH).
5. Remove fender protector (RH). Refer to EXT-28, "Removal and Installation".
6. Disconnect washer tube from front washer motor.
7. Disconnect clips using suitable tool and remove washer tube.

INSTALLATION

Installation is in the reverse order of removal.

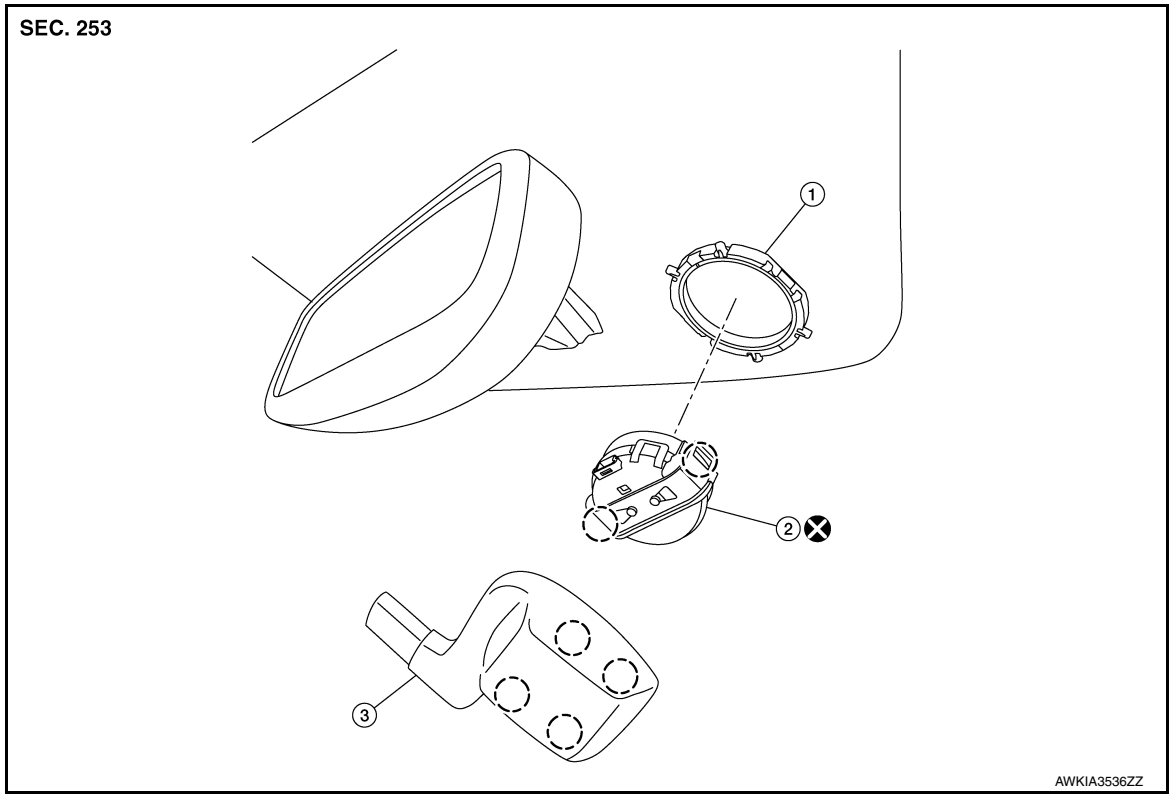
NOTE:
Fill washer tank with specified amount of fluid. Refer to WW-60, "Specifications".

RAIN SENSOR

Exploded View

INFOID:0000000012227394

SEC. 253



1. Rain sensor bracket
2. Rain sensor
3. Rain sensor finisher

Pawl

Front

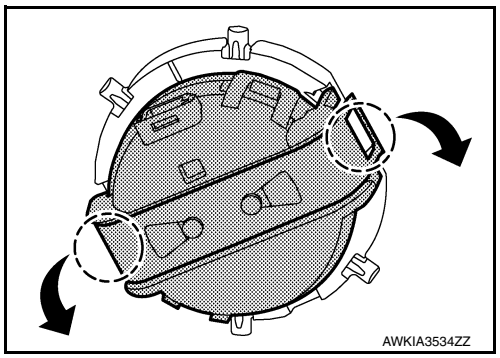
Removal and Installation

INFOID:0000000012227395

CAUTION:
When the rain sensor is removed from the windshield, the rain sensor cannot be reused.

REMOVAL

1. Release rain sensor finishers pawls using a suitable tool, then remove the rain sensor finisher.
2. Disconnect harness connector from rain sensor.
3. Release pawls, then remove rain sensor from the windshield glass.



INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- **The surface of the windshield should be cleaned.**

- **Do not touch gel/adhesive of the new part.**
- **Be sure the metal spring clips are locked so the rain sensor is installed securely.**
- **Do not reuse rain sensor if dropped.**

WIPER AND WASHER SWITCH

Exploded View

INFOID:0000000012157359

The wiper and washer switch is serviced as an assembly with the combination switch assembly. Refer to BCS-83, "Removal and Installation".

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Specifications

INFOID:0000000012157360

WINDSHIELD WASHER FLUID

Windshield washer fluid capacity (with washer tank inlet)	4.2 ℓ (4 1/2 US qt, 3 3/4 Imp qt)
Windshield washer fluid specification	Refer to MA-16, "FOR USA AND CANADA : Fluids and Lubricants" (FOR US AND CANADA) or MA-17, "FOR MEXICO : Fluids and Lubricants" (FOR MEXICO).