SECTION WW
WIPER & WASHER

CONTENTS

PRECAUTION

PRECAUTIONS

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

INFOID:0000000009501753

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

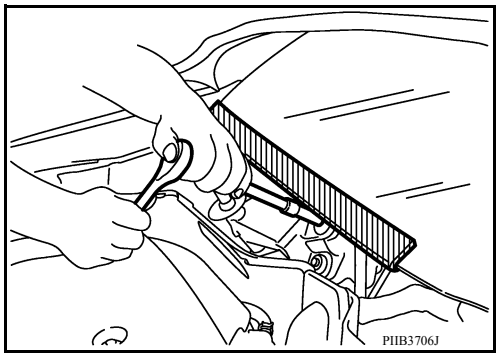
WARNING:

- **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:0000000009269542

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

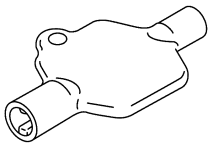


PREPARATION

PREPARATION

Commercial Service Tool

INFOID:0000000009269543

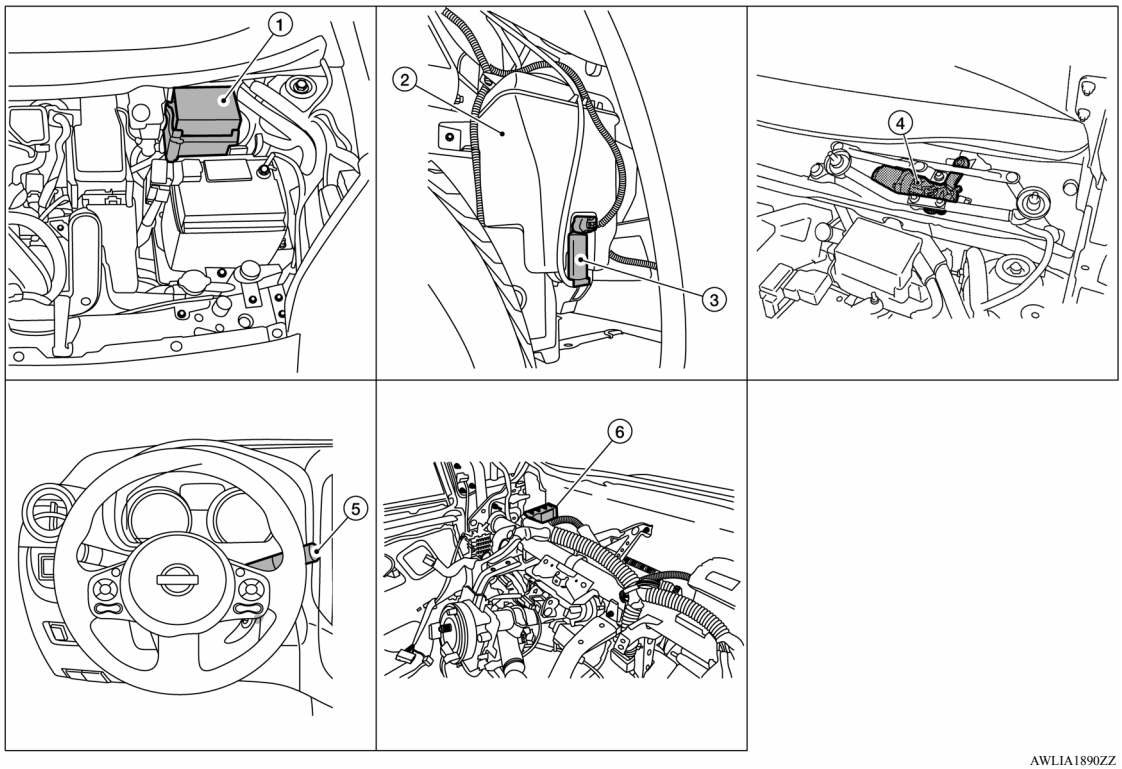
Tool name	Description
Washer nozzle adjuster  JSLIA0149ZZ	Adjusting washer nozzle

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000009269544



AWLIA1890ZZ

1. IPDM E/R
2. Windshield washer tank (view with RF fender protector removed)
3. Front washer motor (view with RF fender protector removed)
4. Front wiper motor (view with cowl top removed)
5. Combination switch (wiper and washer switch)
6. BCM (view with instrument panel removed)

Component Description

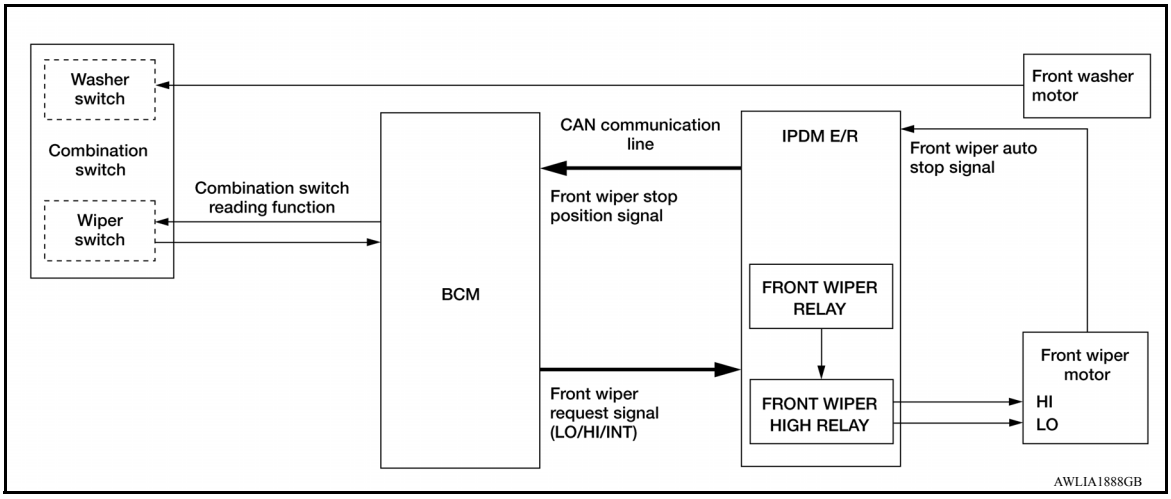
INFOID:0000000009269545

Component	Function
BCM	• Monitors combination switch status by performing the combination switch reading function. • Sends front wiper relay and front wiper high relay ON signals to IPDM E/R.
IPDM E/R	• Controls front wiper relay and front wiper high relay. • Performs the auto stop control of the front wiper.
Combination switch (Wiper and washer switch)	• Provides input for wiper and washer control to BCM. • Refer to WW-6, "System Description" for more information.
Front wiper motor	• Drives windshield wipers in HI or LO mode. • Sends wiper stop signal to IPDM E/R.
Front washer motor	Pumps windshield washer fluid to windshield in wash mode.

SYSTEM

System Diagram

INFOID:0000000009269546



System Description

INFOID:0000000009269547

FRONT WIPER CONTROL (BASIC)

1. BCM detects the combination switch position by the combination switch reading function.
2. BCM transmits the front wiper request signal to the IPDM E/R using CAN communication.
3. IPDM E/R controls the integrated front wiper relay and front wiper high relay based on the status of the front wiper request signal.
4. IPDM E/R provides power to operate the front wiper motor.

LOW SPEED OPERATION

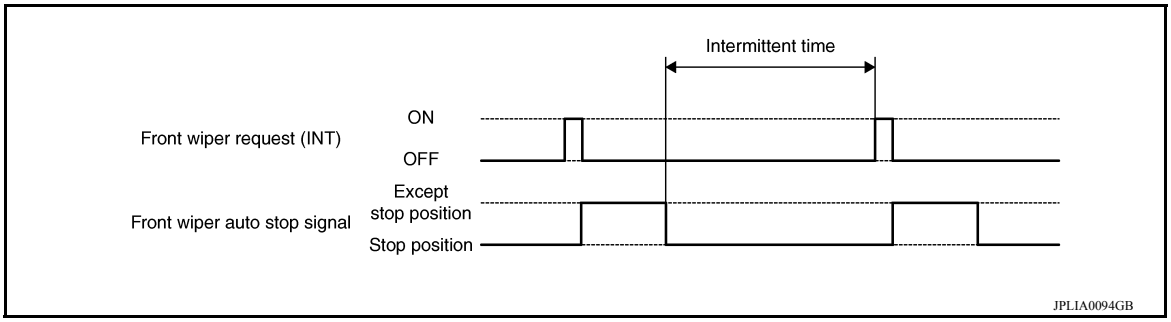
1. Ignition switch ON.
2. Front wiper switch in LO or MIST position.
3. BCM reads the combination switch position and transmits the front wiper request signal (LO) to IPDM E/R using CAN communication.
4. IPDM E/R turns ON the front wiper relay.

HIGH SPEED OPERATION

1. Ignition switch ON.
2. Front wiper switch in HI.
3. BCM reads the combination switch position and transmits the front wiper request signal (HI) to IPDM E/R using CAN communication.
4. IPDM E/R turns ON the front wiper relay and the front wiper high relay.

INTERMITTENT OPERATION

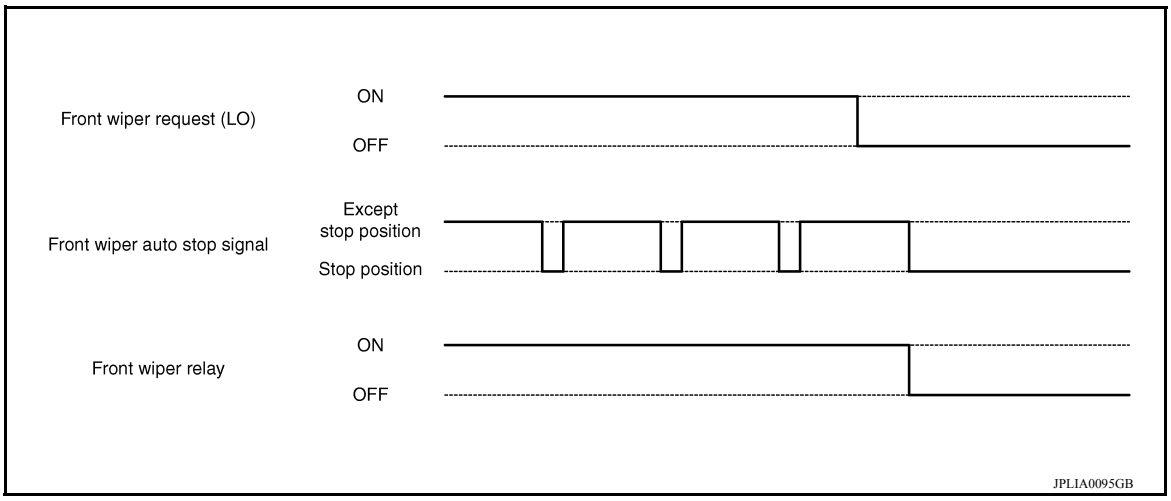
1. Ignition switch ON.
2. Front wiper switch INT.
3. BCM reads the combination switch position. BCM calculates the delay interval based on the table below and then transmits the front wiper request signal (INT) to IPDM E/R using CAN communication.
4. IPDM E/R turns ON the front wiper relay only once.
5. BCM detects stop position of the front wiper motor based on the front wiper stop position signal received from the IPDM E/R.
6. BCM transmits the front wiper request signal (INT) again after the delay interval.



Intermittent switch position	Length of delay	Delay interval (s)
7	Short ↑ ↓ Long	0.4
6		1
5		2
4		3
3		5
2		10
1		16

AUTO STOP OPERATION

1. Front wiper switch is turned OFF.
2. BCM monitors wiper switch position by combination switch reading position function.
3. BCM stops transmitting the front wiper request signal to the IPDM E/R.
4. IPDM E/R detects the front wiper auto stop signal from the position of the front wiper motor (stop position/ except stop position).
5. 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.
6. IPDM E/R turns the front wiper relay OFF when the front wiper motor has reached the stop position.



MIST OPERATION

1. Ignition switch ON.
2. Front washer switch in OFF position.
3. Front wiper switch in MIST position.
4. BCM reads the combination switch position and transmits the front wiper request signal (LO) to IPDM E/R using CAN communication.
5. IPDM E/R turns ON the front wiper relay.
6. The front wiper operates once after the front washer operation.

WIPER/WASHER OPERATION

1. Ignition switch ON.

2. Front washer switch ON.
3. The front washer switch provides ground for the front washer motor.
4. BCM reads the combination switch position and transmits the front wiper request signal (LO) to IPDM E/R using CAN communication.
5. BCM transmits the front wiper request signal (LO) to IPDM E/R using CAN communication.
6. IPDM E/R turns ON the front wiper relay.
7. The front wiper operates.

NOTE:
BCM transmits the front wiper request signal (LO) so that the front wiper operates approximately 3 times after front washer switch OFF is detected.

Fail-Safe

INFOID:0000000009269548

FAIL−SAFE OPERATION

IPDM E/R performs the fail-safe function when the front wiper auto stop circuit is malfunctioning. Refer to PCS-18, "Fail-safe" or PCS-44, "Fail-Safe".

DIAGNOSIS SYSTEM (BCM) (WITH INTELLIGENT KEY SYSTEM)
COMMON ITEM

COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)

INFOID:0000000009543736

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	HEAD LAMP			×	×	×		
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 open	TRUNK			×				
Vehicle security system	THEFT ALM			×	×	×		
RAP system	RETAINED PWR			×		×		
Signal buffer system	SIGNAL BUFFER			×				
TPMS	AIR PRESSURE MONITOR		×	×	×	×		
Panic alarm system	PANIC ALARM				×			

WIPER

WIPER : CONSULT Function (BCM - WIPER)

INFOID:0000000009543737

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.

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
WIPER SPEED SETTING	On	Front wiper intermittent time linked with vehicle speed and wiper dial position.
	Off*	Front wiper intermittent time linked with wiper dial position.

* : Initial setting

DIAGNOSIS SYSTEM (BCM) (WITHOUT INTELLIGENT KEY SYSTEM) COMMON ITEM

COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)

INFOID:0000000009543738

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			×	×	×		
Remote keyless entry system	MULTI REMOTE ENT			×	×	×		
Exterior lamp	HEAD LAMP			×	×	×		
Wiper and washer	WIPER			×	×	×		
Turn signal and hazard warning lamps	FLASHER			×	×			
Air conditioner	AIR CONDITIONER			×				
Combination switch	COMB SW			×				
BCM	BCM	×	×			×	×	×
Immobilizer	IMMU		×		×	×		
Interior room lamp battery saver	BATTERY SAVER			×	×	×		
Trunk open	TRUNK			×				
Vehicle security system	THEFT ALM			×	×	×		
Signal buffer system	SIGNAL BUFFER			×	×			
TPMS	AIR PRESSURE MONITOR		×	×	×	×		
Panic alarm system	PANIC ALARM				×			

WIPER

WIPER : CONSULT Function (BCM - WIPER)

INFOID:0000000009543739

DATA MONITOR

Monitor Item [Unit]	Description
IGN ON SW [On/Off]	Indicates condition of ignition switch ON position.
IGN SW CAN [On/Off]	Indicates ignition switch ON signal received from IPDM E/R on CAN communication line.
FR WIPER HI [On/Off]	Indicates condition of wiper operation of combination switch.
FR WIPER LOW [On/Off]	
FR WIPER INT [On/Off]	
FR WASHER SW [On/Off]	
INT VOLUME [1 – 7]	Indicates condition of intermittent wiper operation of combination switch.
FR WIPER STOP [On/Off]	Indicates front wiper auto stop signal received from IPDM E/R on CAN communication line.
REVERSE SW CAN [On/Off]	Indicates reverse switch signal received from TCM on CAN communication line.
VEHICLE SPEED [km/h/mph]	Indicates vehicle speed signal received from combination meter on CAN communication line.

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
WIPER SPEED SETTING	On	Front wiper intermittent time linked with vehicle speed and wiper dial position.
	Off*	Front wiper intermittent time linked with wiper dial position.

* : Initial setting

DIAGNOSIS SYSTEM (IPDM E/R) (WITH INTELLIGENT KEY SYSTEM)

Diagnosis Description

INFOID:0000000009543740

AUTO ACTIVE TEST

Description

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

- Front wiper (LO, HI)
- Parking lamp
- License plate lamp
- Tail lamp
- Front fog lamp
- Headlamp (LO, HI)
- A/C compressor (magnet clutch)
- Cooling fan

Operation Procedure

NOTE:

Never perform auto active test in the following conditions.

- Passenger door is open
- 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.
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.

NOTE:

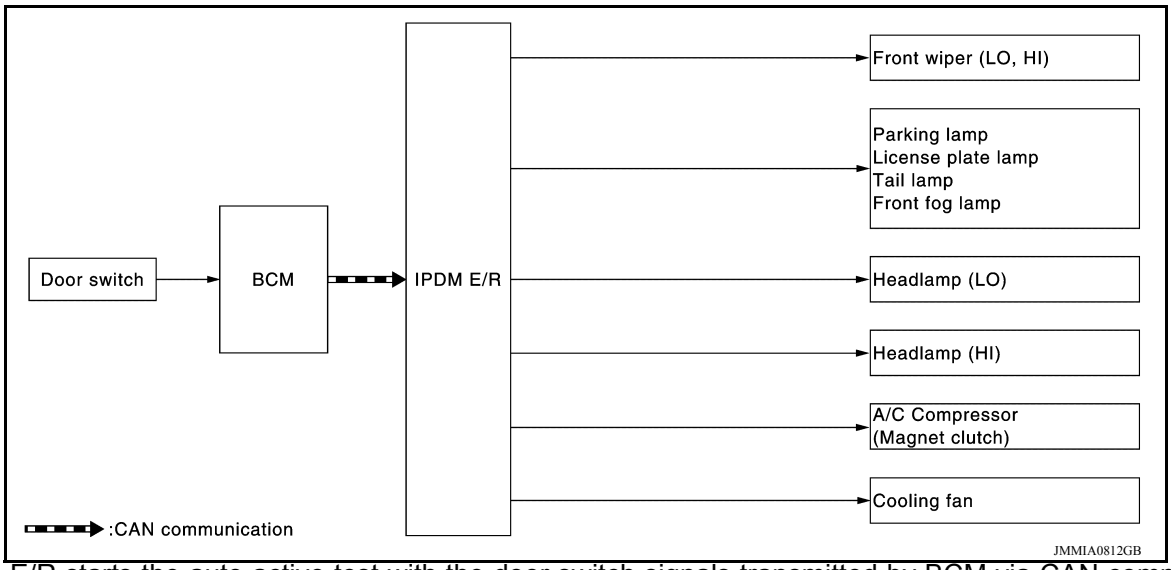
- When auto active test has to be cancelled halfway through test, turn the ignition switch OFF.
- When auto active test is not activated, door switch may be the cause. Check door switch. Refer to DLK-89, "Component Function Check".

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	Front wiper	LO for 5 seconds → HI for 5 seconds
2	• Parking lamp • License plate lamp • Tail lamp • Front fog lamp	10 seconds
3	Headlamp	LO for 10 seconds →HI ON ⇔ OFF 5 times
4	A/C compressor (magnet clutch)	ON ⇔ OFF 5 times
5	Cooling fan	LO for 5 seconds → MID for 3 seconds → HI for 2 seconds

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
Any of the following components do not operate • Parking lamp • License plate lamp • Tail 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	• BCM signal input circuit • CAN communication signal between BCM 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
Cooling fan does not operate	Perform auto active test. Does the cooling fan operate?	YES	• ECM signal input circuit • CAN communication signal between ECM and IPDM E/R
		NO	• Cooling fan motor • Harness or connector between IPDM E/R and cooling fan motor • IPDM E/R

CONSULT Function (IPDM E/R)

INFOID:0000000009543741

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.

Direct Diagnostic Mode	Description
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-19, "DTC Index".

DATA MONITOR

Monitor Item [Unit]	Main Signals	Description
MOTOR FAN REQ [%]	×	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
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
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 light request signal received from BCM on CAN communication line
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

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-12, "CAN Diagnostic Support Monitor".

DIAGNOSIS SYSTEM (IPDM E/R) (WITHOUT INTELLIGENT KEY SYSTEM)

Diagnosis Description

INFOID:0000000009543742

AUTO ACTIVE TEST

Description

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

- Front wiper (LO, HI)
- Parking lamp
- License plate lamp
- Tail lamp
- Front fog lamp
- Headlamp (LO, HI)
- A/C compressor (magnet clutch)
- Cooling fan

Operation Procedure

NOTE:

Never perform auto active test in the following conditions.

- Passenger door is open
- 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.
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.

NOTE:

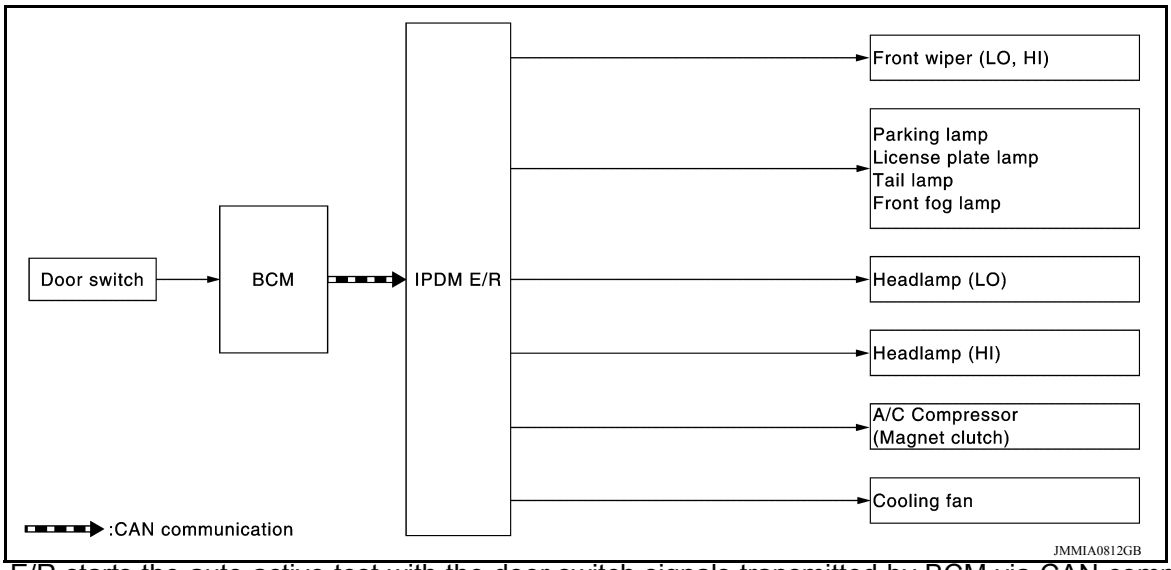
- When auto active test has to be cancelled halfway through test, turn the ignition switch OFF.
- When auto active test is not activated, door switch may be the cause. Check door switch. Refer to DLK-235, "Component Function Check".

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	Front wiper	LO for 5 seconds → HI for 5 seconds
2	• Parking lamp • License plate lamp • Tail lamp • Front fog lamp	10 seconds
3	Headlamp	LO for 10 seconds →HI ON ⇔ OFF 5 times
4	A/C compressor (magnet clutch)	ON ⇔ OFF 5 times
5	Cooling fan	LO for 5 seconds → MID for 3 seconds → HI for 2 seconds

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
Any of the following components do not operate • Parking lamp • License plate lamp • Tail 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	• BCM signal input circuit • CAN communication signal between BCM 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
Cooling fan does not operate	Perform auto active test. Does the cooling fan operate?	YES	• ECM signal input circuit • CAN communication signal between ECM and IPDM E/R
		NO	• Cooling fan motor • Harness or connector between IPDM E/R and cooling fan motor • IPDM E/R

CONSULT Function (IPDM E/R)

INFOID:0000000009543751

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.

Direct Diagnostic Mode	Description
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-46, "DTC Index".

DATA MONITOR

Monitor Item [Unit]	Main Signals	Description
MOTOR FAN REQ [%]	×	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
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
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 light request signal received from BCM on CAN communication line
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

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-12, "CAN Diagnostic Support Monitor".

ECU DIAGNOSIS INFORMATION

BCM, IPDM E/R

List of ECU Reference

INFOID:0000000009269557

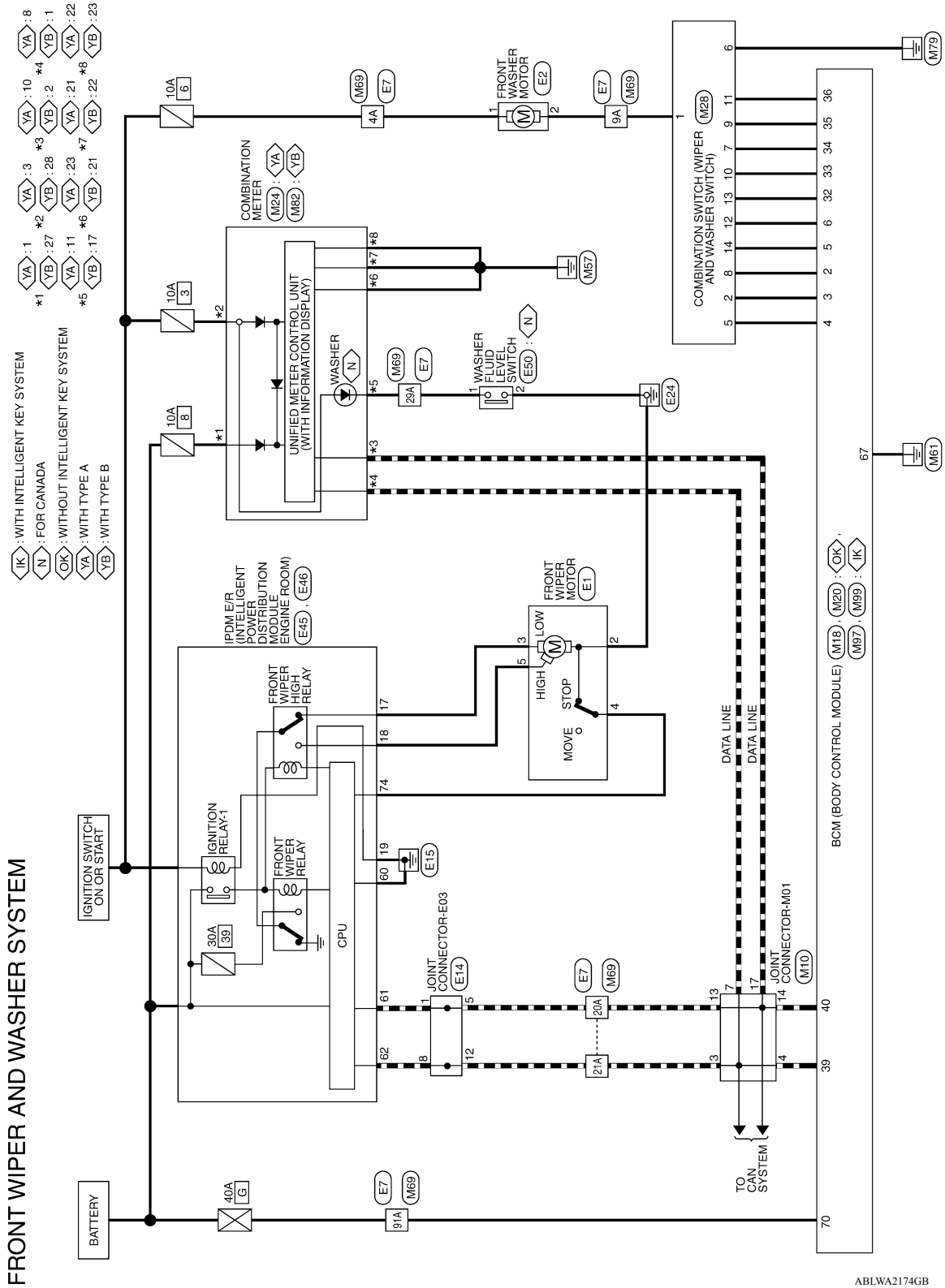
ECU	Reference
BCM (with Intelligent Key system)	BCS-28, "Reference Value"
	BCS-45, "Fail-safe"
	BCS-47, "DTC Inspection Priority Chart"
	BCS-48, "DTC Index"
BCM (without Intelligent Key system)	BCS-93, "Reference Value"
	BCS-104, "Fail-safe"
	BCS-104, "DTC Inspection Priority Chart"
	BCS-105, "DTC Index"
IPDM E/R (with Intelligent Key system)	PCS-13, "Reference Value"
	PCS-18, "Fail-safe"
	PCS-19, "DTC Index"
IPDM E/R (without Intelligent Key system)	PCS-40, "Reference Value"
	PCS-44, "Fail-Safe"
	PCS-46, "DTC Index"

WIRING DIAGRAM

FRONT WIPER AND WASHER SYSTEM

Wiring Diagram

INFOID:0000000009269558



FRONT WIPER AND WASHER SYSTEM CONNECTORS

Connector No.	M10
Connector Name	JOINT CONNECTOR-M01
Connector Color	GRAY

H.S.

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

Terminal No.	Color of Wire	Signal Name
3	L	–
4	L	–
7	L	–
13	P	–
14	P	–
17	P	–

Connector No.	M18
Connector Name	BCM (BODY CONTROL MODULE) (WITHOUT INTELLIGENT KEY SYSTEM)
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	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

Terminal No.	Color of Wire	Signal Name
2	BR	INPUT 5
3	Y	INPUT 4
4	L	INPUT 3
5	G	INPUT 2
6	R	INPUT 1
32	P	OUTPUT 5
33	V	OUTPUT 4
34	W	OUTPUT 3
35	GR	OUTPUT 2
36	LG	OUTPUT 1
39	L	CAN-H
40	P	CAN-L

Connector No.	M20
Connector Name	BCM (BODY CONTROL MODULE) (WITHOUT INTELLIGENT KEY SYSTEM)
Connector Color	BLACK

H.S.

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

Terminal No.	Color of Wire	Signal Name
67	B	GND
70	G	BATTERY (F/L)

Connector No.	M24
Connector Name	COMBINATION METER (WITH TYPE A)
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	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

Terminal No.	Color of Wire	Signal Name
1	R	BAT
3	GR	IGN
8	L	CAN-H
10	P	CAN-L
11	V	WASHER SW
21	B	GND (POWER)
22	B	GND (CIRCUIT)
23	B/W	GND (ILL)

Connector No.	M28
Connector Name	COMBINATION SWITCH
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	O	–
2	Y	–
5	L	–
6	B	–
7	W	–
8	BR	–
9	GR	–
10	V	–
11	LG	–
12	R	–
13	P	–
14	G	–

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Connector No.	M82
Connector Name	COMBINATION METER (WITH TYPE B)
Connector Color	WHITE

H.S.

20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21

Terminal No.	Color of Wire	Signal Name
1	L	CAN-H
2	P	CAN-L
17	V	WASHER SW
21	B/W	GND (ILL)
22	B	GND (POWER)
23	B	GND (CIRCUIT)
27	R	BAT
28	GR	IGN

Connector No.	M99
Connector Name	BCM (BODY CONTROL MODULE) (WITH INTELLIGENT KEY SYSTEM)
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
67	B	GND
70	G	BATTERY (F/L)

Connector No.	M69
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
4A	SB	–
9A	O	–
20A	P	–
21A	L	–
29A	V	–
91A	G	–

Connector No.	M97
Connector Name	BCM (BODY CONTROL MODULE) (WITH INTELLIGENT KEY SYSTEM)
Connector Color	BLACK

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	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

Terminal No.	Color of Wire	Signal Name
2	BR	INPUT 5
3	Y	INPUT 4
4	L	INPUT 3

Terminal No.	Color of Wire	Signal Name
5	G	INPUT 2
6	R	INPUT 1
32	P	OUTPUT 5
33	V	OUTPUT 4
34	W	OUTPUT 3
35	GR	OUTPUT 2
36	LG	OUTPUT 1
39	L	CAN-H
40	P	CAN-L

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Connector No.	E1
Connector Name	FRONT WIPER MOTOR
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	–	–
2	B	–
3	LG	–
4	V	–
5	GR	–

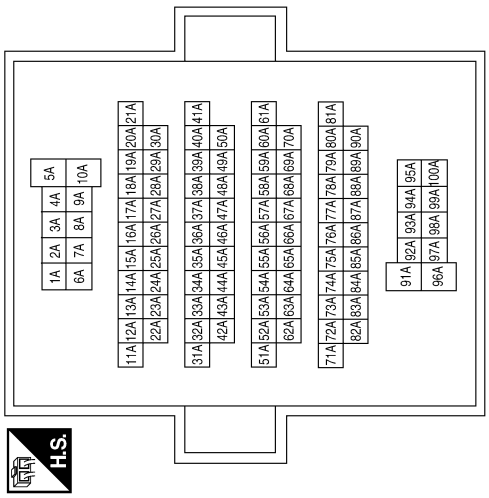
Connector No.	E2
Connector Name	FRONT WASHER MOTOR
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	SB	–
2	Y	–

Connector No.	E7
Connector Name	WIRE TO WIRE
Connector Color	WHITE

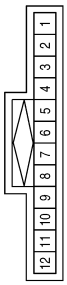
H.S.



Terminal No.	Color of Wire	Signal Name
4A	SB	–
9A	Y	–
20A	P	–
21A	L	–
29A	R	–
91A	Y	–

Connector No.	E14
Connector Name	JOINT CONNECTOR-E03
Connector Color	BLUE

H.S.



Terminal No.	Color of Wire	Signal Name
1	P	–
5	P	–
8	L	–
12	L	–

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Connector No.	E45
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BROWN

H.S.

21	20		19	18	17
28	27	26	25	24	23	22

Terminal No.	Color of Wire	Signal Name
17	LG	FR WIPER LO
18	GR	FR WIPER HI
19	B	GND (POWER)

Connector No.	E46
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE

H.S.

64	63	62	61	60	59	58	57	56	55	54	53
76	75	74	73	72	71	70	69	68	67	66	65

Terminal No.	Color of Wire	Signal Name
60	B	GND (SIGNAL)
61	P	CAN-L
62	L	CAN-H
74	V	WIPER AUTOSTOP

Connector No.	E50
Connector Name	WASHER FLUID LEVEL SWITCH
Connector Color	BROWN

H.S.

2	1

Terminal No.	Color of Wire	Signal Name
1	R	–
2	B	–

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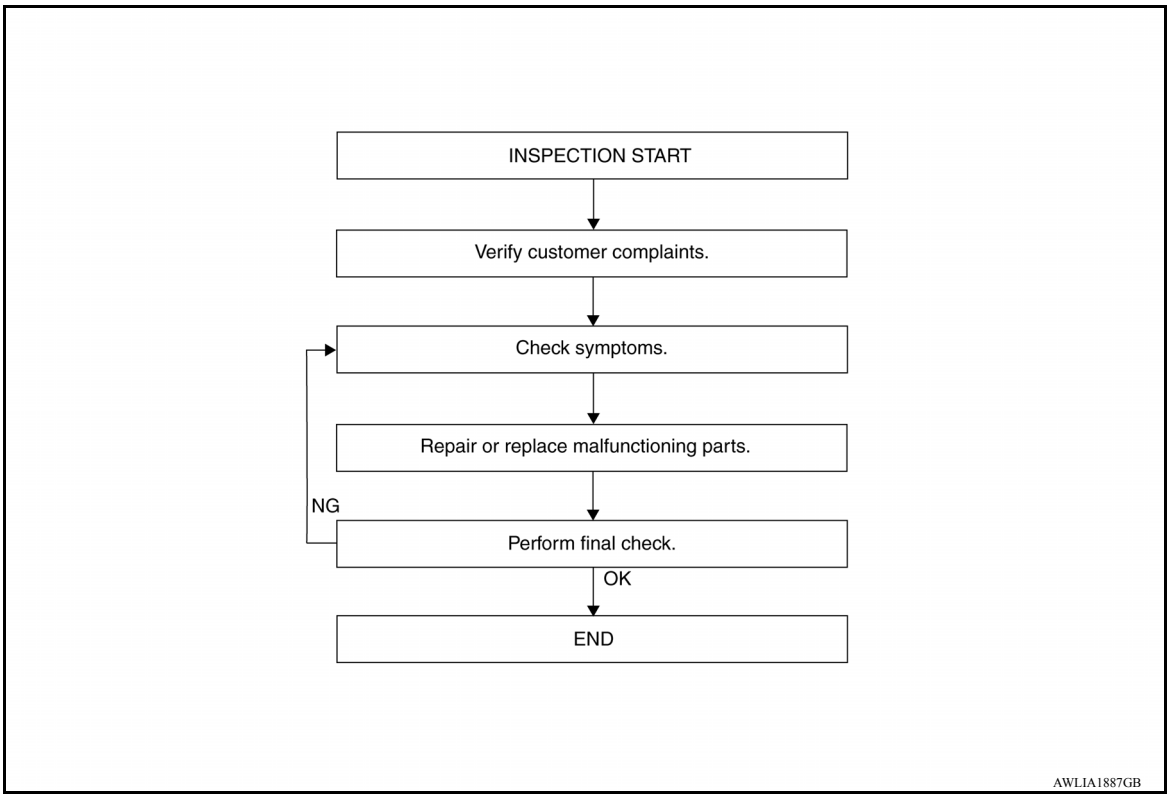
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000009269559

WORK FLOW



DETAILED FLOW

1. REVIEW CUSTOMER COMPLAINT

Review customer complaint. Try to obtain detailed information about the conditions when the symptom occurs.

>> GO TO 2

2. VERIFY THE SYMPTOM

Verify the symptom by performing an operational check. Refer to WW-6, "System Description".

>> GO TO 3

3. PERFORM TROUBLE DIAGNOSIS BY SYMPTOM

Diagnose the vehicle by performing the appropriate trouble diagnosis. Refer to WW-39, "Symptom Table".

>> GO TO 4

4. REPAIR OR REPLACE MALFUNCTIONING PARTS

Repair or replace the specific parts.

>> GO TO 5

5. FINAL CHECK

Perform a final inspection of the system.

Is the inspection result normal?

YES >> Inspection End.
NO >> GO TO 2.

DTC/CIRCUIT DIAGNOSIS

WIPER AND WASHER FUSE

Description

INFOID:0000000009269560

Component	Capacity	Fuse No.	Location
Front wiper motor	30 A	39	IPDM E/R
Front washer motor	10 A	6	Fuse block (J/B)

Diagnosis Procedure

INFOID:0000000009269561

1. CHECK FUSES

Check that the following fuses are not blown.

Component	Capacity	Fuse No.	Location
Front wiper motor	30 A	39	IPDM E/R
Front washer motor	10 A	6	Fuse block (J/B)

Is the fuse blown?

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

FRONT WIPER MOTOR LO CIRCUIT

Component Function Check

INFOID:0000000009269562

1.CHECK FRONT WIPER LO OPERATION

IPDM E/R AUTO ACTIVE TEST
1. Start IPDM E/R auto active test. Refer to PCS-9, "Diagnosis Description" or PCS-36, "Diagnosis Description".
2. Check that the front wiper operates on LO operation.

CONSULT ACTIVE TEST
1. Select FR WIPER of BCM (WIPER) active test item.
2. Check front wiper operation.

LO : Front wiper (LO) operation
OFF : Front wiper OFF

Is the inspection result normal?

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

Diagnosis Procedure

INFOID:0000000009269563

Regarding Wiring Diagram information, refer to WW-22, "Wiring Diagram".

1. CHECK FRONT WIPER MOTOR FUSE

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

Component	Capacity	Fuse No.	Location
Front wiper motor	30 A	39	IPDM E/R

Is the fuse blown?

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

2. CHECK FRONT WIPER MOTOR (LO) OUTPUT VOLTAGE

1. Turn the ignition switch ON.
2. Select FR WIPER of BCM (WIPER) active test item.
3. While performing the active test, check voltage between IPDM E/R harness connector and ground.

Terminals			FRONT WIPER	Voltage (Approx.)
(+)		(-)		
IPDM E/R		Ground		
Connector	Terminal			
E45	17		LO	Battery voltage
			OFF	0V

Is the inspection result normal?

YES >> GO TO 3
NO >> Replace IPDM E/R. Refer to PCS-56, "Removal and Installation".

3. CHECK FRONT WIPER MOTOR (LO) OPEN CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect IPDM E/R and front wiper motor.
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	
E45	17	E1	3	Yes

Is the inspection result normal?

YES >> Replace front wiper motor. Refer to WW-46, "WIPER DRIVE ASSEMBLY : Removal and Installation".

NO >> Repair or replace harness.

FRONT WIPER MOTOR HI CIRCUIT

Component Function Check

INFOID:0000000009269564

1.CHECK FRONT WIPER HI OPERATION

IPDM E/R AUTO ACTIVE TEST
1. Start IPDM E/R auto active test. Refer to PCS-9, "Diagnosis Description" or PCS-36, "Diagnosis Description".
2. Check that the front wiper operates on HI operation.

CONSULT ACTIVE TEST
1. Select FR WIPER of BCM (WIPER) active test item.
2. Check front wiper operation.

HI : Front wiper (HI) operation
OFF : Front wiper OFF

Is the inspection result normal?

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

Diagnosis Procedure

INFOID:0000000009269565

Regarding Wiring Diagram information, refer to WW-22, "Wiring Diagram".

1. CHECK FRONT WIPER MOTOR FUSE

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

Component	Capacity	Fuse No.	Location
Front wiper motor	30 A	39	IPDM E/R

Is the fuse blown?

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

2. CHECK FRONT WIPER MOTOR (HI) OUTPUT VOLTAGE

1. Turn the ignition switch ON.
2. Select FR WIPER of BCM (WIPER) active test item.
3. While performing the active test, check voltage between IPDM E/R harness connector and ground.

Terminals			FRONT WIPER	Voltage (Approx.)
(+)		(-)		
IPDM E/R		Ground		
Connector	Terminal			
E45	18		HI	Battery voltage
			OFF	0V

Is the inspection result normal?

YES >> GO TO 3
NO >> Replace IPDM E/R. Refer to PCS-56, "Removal and Installation".

3. CHECK FRONT WIPER MOTOR (HI) OPEN CIRCUIT

1. Turn the ignition switch OFF.
2. Disconnect IPDM E/R and front wiper motor.
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	
E45	18	E1	5	Yes

Is the inspection result normal?

YES >> Replace front wiper motor. Refer to WW-46, "WIPER DRIVE ASSEMBLY : Removal and Installation".

NO >> Repair or replace harness.

FRONT WIPER AUTO STOP SIGNAL CIRCUIT

Component Function Check

INFOID:0000000009269566

1. CHECK FRONT WIPER (AUTO STOP) SIGNAL

1. Select FR WIPER STOP of BCM (WIPER) data monitor item.
2. Operate the front wiper.
3. Check that FR WIPER STOP changes from ON to OFF according to the wiper position.

Data monitor	Condition		Status
FR WIPER STOP	Front wiper motor	Stop position	ON
		Except stop position	OFF

Is the inspection result normal?

YES >> Front wiper auto stop signal circuit is normal.
NO >> Refer to WW-34, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000009269567

Regarding Wiring Diagram information, refer to WW-22, "Wiring Diagram".

1. CHECK FRONT WIPER MOTOR (AUTO STOP) OUTPUT VOLTAGE

1. Turn the ignition switch ON.
2. Check voltage between IPDM E/R harness connector and ground.

Terminals			FRONT WIPER	Voltage (Approx.)
(+)		(-)		
IPDM E/R		Ground		
Connector	Terminal			
E46	74		Except stop position	Battery voltage
			Stop position	0 V

Is the inspection result normal?

YES >> Check for intermittent failure.
NO >> GO TO 2

2. CHECK FRONT WIPER MOTOR (AUTO STOP) SHORT CIRCUIT

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

IPDM E/R		Ground	Continuity
Connector	Terminal		
E46	74		No

Is the inspection result normal?

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

3. CHECK FRONT WIPER MOTOR (AUTO STOP) CIRCUIT CONTINUITY

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	
E46	74	E1	4	Yes

Is the inspection result normal?

YES >> Replace front wiper motor. Refer to WW-46, "WIPER DRIVE ASSEMBLY : Removal and Installation".

NO >> Repair or replace harness.

FRONT WIPER MOTOR GROUND CIRCUIT

Diagnosis Procedure

INFOID:0000000009269568

Regarding Wiring Diagram information, refer to WW-22, "Wiring Diagram".

1. CHECK FRONT WIPER MOTOR GROUND CIRCUIT

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

Front wiper motor		Ground	Continuity
Connector	Terminal		
E1	2		Yes

Is the inspection result normal?

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

WASHER MOTOR CIRCUIT

Diagnosis Procedure

INFOID:0000000009269569

Regarding Wiring Diagram information, refer to WW-22, "Wiring Diagram".

1. CHECK FRONT WASHER MOTOR FUSE

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

Component	Capacity	Fuse No.	Location
Front washer motor	10A	6	Fuse block (J/B)

Is the fuse blown?

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

2. CHECK FRONT WASHER MOTOR POWER SUPPLY

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

Terminals			Voltage (Approx.)
(+)		(-)	
Front washer motor		Ground	
Connector	Terminal		
E2	1		Battery voltage

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness between fuse and front washer motor.

3. CHECK FRONT WASHER MOTOR GROUND CIRCUIT

Check continuity between front washer motor harness connector and ground while operating washer switch.

Front washer motor		Ground	Washer switch	Continuity
Connector	Terminal			
E2	2		ON	Yes
			OFF	No

Is the inspection result normal?

YES >> Replace front washer motor. Refer to WW-50, "Removal and Installation".
NO >> GO TO 4.

4. CHECK WASHER SWITCH

Check washer switch. Refer to WW-38, "Component Inspection".

Is the inspection result normal?

YES >> Repair harness between front washer motor washer switch.
NO >> Replace washer switch. Refer to WW-55, "Removal and Installation".

WASHER SWITCH

Description

INFOID:0000000009269570

- Washer switch is integrated with combination switch.
- Washer switch supplies ground for the front washer motor.

Component Inspection

INFOID:0000000009269571

1. CHECK WASHER SWITCH

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

Combination switch (washer switch)		Condition	Continuity
Terminals			
1	6	Washer switch ON	Yes
		Washer switch OFF	No

Is the inspection result normal?

YES >> Washer switch is normal.
NO >> Replace combination switch (wiper and washer switch). Refer to WW-55, "Removal and Installation".

SYMPTOM DIAGNOSIS

WIPER AND WASHER SYSTEM SYMPTOMS

Symptom Table

INFOID:0000000009269572

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

Symptom		Possible malfunction	Reference
Front wiper does not operate in...	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-121, "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 (IPDM E/R)	Check FR WIP REQ in DATA MONITOR of IPDM E/R. Refer to PCS-37, "CONSULT Function (IPDM E/R)".
	LO and INT	• 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-121, "Symptom Table".
		• IPDM E/R • Harness between IPDM E/R and front wiper motor • Front wiper motor	Front wiper motor (LO) circuit Refer to WW-30, "Component Function Check".
		Front wiper request signal (IPDM E/R)	Check FR WIP REQ in DATA MONITOR of IPDM E/R. Refer to PCS-37, "CONSULT Function (IPDM E/R)".
	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-121, "Symptom Table".
		Front wiper request signal (IPDM E/R)	Check FR WIP REQ in DATA MONITOR of IPDM E/R. Refer to PCS-37, "CONSULT Function (IPDM E/R)".
	Any mode	—	Refer to WW-41, "Diagnosis Procedure".
Front wiper does not stop in...	Any mode	Front wiper auto stop signal (IPDM E/R)	Refer to WW-34, "Component Function Check".
		• Combination switch (wiper and washer switch) • BCM	Combination switch (wiper and washer switch) Refer to BCS-121, "Symptom Table".

Symptom		Possible malfunction	Reference
Front wiper operates abnormally because...	Intermittent adjustments cannot be made.	• 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-121, "Symptom Table".
	Wiper/washer will not operate together.	• 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-121, "Symptom Table".
	Wipers will not return to stop position (repeatedly operates for 10 seconds and then stops for 20 seconds. Wipers then stop operating).	• IPDM E/R • Harness between IPDM E/R and front wiper motor • Front wiper motor	Front wiper auto stop signal circuit Refer to WW-34, "Component Function Check".
Front washer motor does not operate...	When washer switch is pressed.	• Low washer fluid • Obstructed or disconnected washer hose or nozzle	Refer to WW-52, "Exploded View".
		• Front washer motor • Harness between combination switch (wiper and washer switch) and front washer motor	Refer to WW-37, "Diagnosis Procedure" (washer motor). Refer to WW-38, "Component Inspection" (washer switch).
		Combination switch (wiper and washer switch)	Combination switch (wiper and washer switch) Refer to BCS-121, "Symptom Table".

FRONT WIPER DOES NOT OPERATE

Description

INFOID:0000000009269573

The front wiper does not operate under any operation conditions.

Diagnosis Procedure

INFOID:0000000009269574

Regarding Wiring Diagram information, refer to WW-22, "Wiring Diagram".

1. CHECK WIPER RELAY OPERATION

IPDM E/R AUTO ACTIVE TEST
1. Start IPDM E/R auto active test. Refer to PCS-10, "CONSULT Function (IPDM E/R)" or PCS-37, "CONSULT Function (IPDM E/R)".
2. Check that the front wiper operates on LO and HI operation.

CONSULT ACTIVE TEST
1. Select FR WIPER of BCM (WIPER) active test item.
2. Check front wiper operation.

LO : Front wiper LO operation
HI : Front wiper HI operation
OFF : Front wiper stop

Is the inspection result normal?

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

2. CHECK FRONT WIPER MOTOR FUSE

Refer to WW-29, "Diagnosis Procedure".

Is the fuse blown?

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

3. CHECK FRONT WIPER MOTOR GROUND CIRCUIT

Refer to WW-36, "Diagnosis Procedure".

Is the inspection result normal?

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

4. CHECK FRONT WIPER MOTOR OUTPUT VOLTAGE

1. Turn the ignition switch ON.
2. With CONSULT, select FRONT WIPER of IPDM E/R ACTIVE TEST item.
3. Check voltage between IPDM E/R harness connector and ground while wipers are operating.

Terminals			FRONT WIPER	Voltage (Approx.)
(+)		(–)		
IPDM E/R				
Connector	Terminal			
E45	17	Ground	LO	Battery voltage
			OFF	0 V
	18		HI	Battery voltage
			OFF	0 V

Is the inspection result normal?

YES >> Replace front wiper motor. Refer to WW-46, "WIPER DRIVE ASSEMBLY : Removal and Installation".
NO >> Replace IPDM E/R. Refer to PCS-56, "Removal and Installation".

5. CHECK FRONT WIPER REQUEST SIGNAL INPUT

1. With CONSULT, select FR WIP REQ in DATA MONITOR of IPDM E/R.
2. Switch the front wiper switch to HI and LO.
3. Check the status of FR WIP REQ while operating the switch.

Data monitor	Condition	Status
FR WIP REQ	Front wiper switch OFF	STOP
	Front wiper switch LO	LOW
	Front wiper switch HI	HI

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-56, "Removal and Installation".
NO >> GO TO 6

6. CHECK COMBINATION SWITCH (WIPER AND WASHER SWITCH)

Check combination switch (wiper and washer switch). Refer to BCS-121, "Symptom Table".

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-69, "Removal and Installation".
NO >> Repair or replace the applicable parts.

NORMAL OPERATING CONDITION

Description

INFOID:0000000009269575

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.

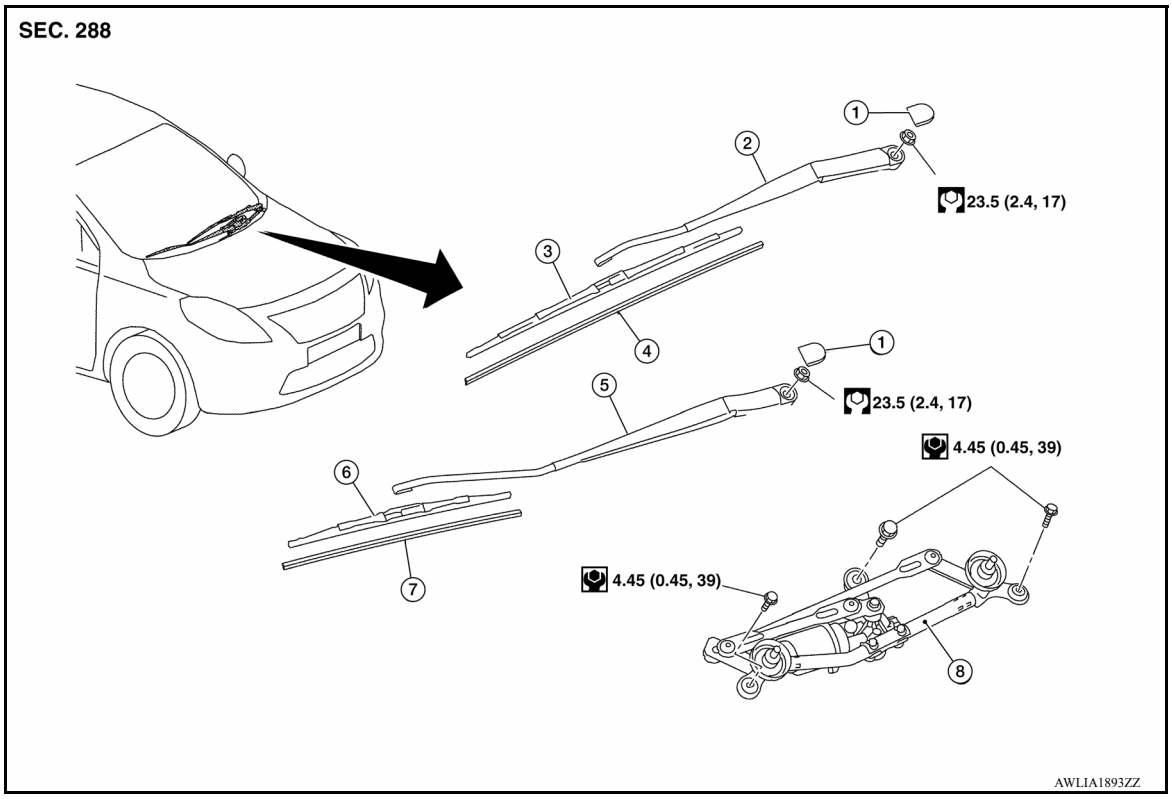
REMOVAL AND INSTALLATION

FRONT WIPER

Exploded View

INFOID:0000000009269576

EXPLODED VIEW



1. Wiper arm cap
2. Wiper arm (LH)
3. Wiper blade (LH)
4. Wiper refill (LH)
5. Wiper arm (RH)
6. Wiper blade (RH)
7. Wiper refill (RH)
8. Wiper drive assembly

WIPER ARM

WIPER ARM : Removal and Installation

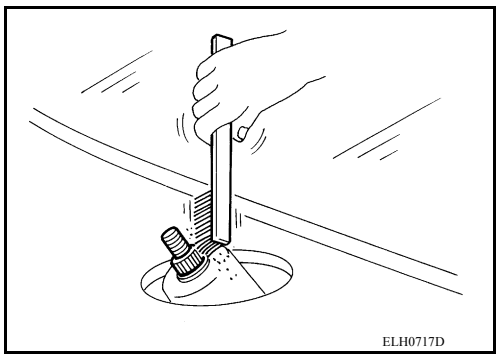
INFOID:0000000009269577

REMOVAL

1. Operate wiper to move it to the auto stop position.
2. Fully open hood assembly.
3. Remove wiper arm caps.
4. Remove wiper arm nuts.
5. Raise wiper arm and remove wiper arm from the vehicle.

INSTALLATION

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



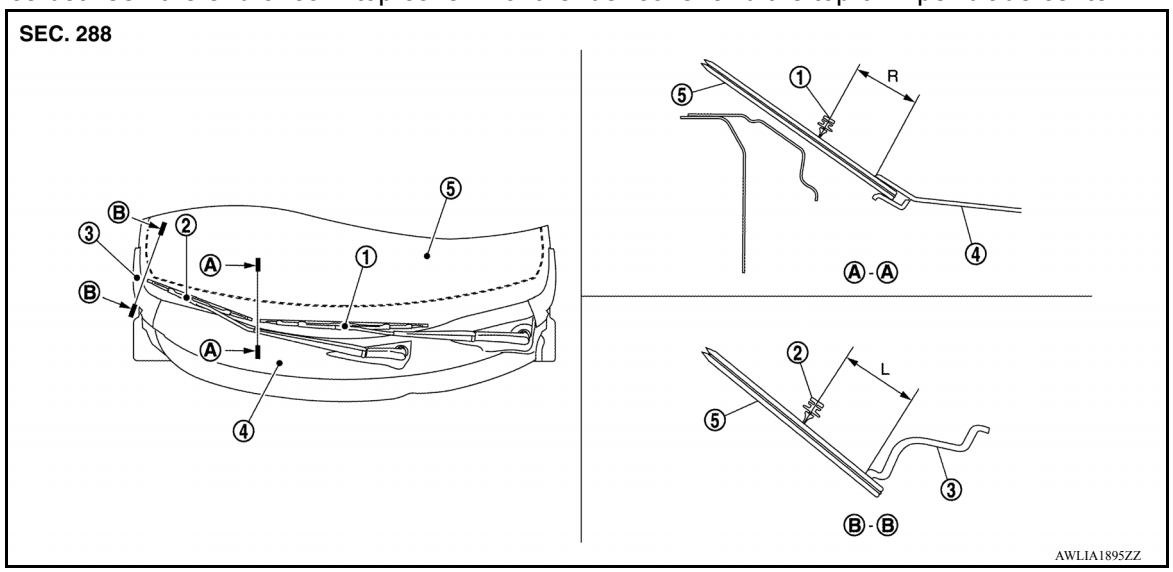
2. Operate wiper motor to move the wiper to the auto stop position.
3. Install wiper arm to wiper drive assembly. Temporarily tighten nut.
4. Adjust wiper blade position. Refer to WW-45, "WIPER ARM : Adjustment".
5. Tighten wiper arm nuts to specification.
6. Operate wiper to move it to the auto stop position.
CAUTION:
Before operating wiper, spray washer fluid so that windshield glass damage by wiper operation is prevented.
7. Check that wiper blades stop at the specified position.
8. Install wiper arm caps.

WIPER ARM : Adjustment

INFOID:0000000009269578

WIPER BLADE POSITION ADJUSTMENT

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



1. Wiper blade (LH)
2. Wiper blade (RH)
3. Front fender cover (RH)
4. Cowl top cover
5. Windshield glass

Standard clearance

R : 44.2 ± 7.5 mm (1.74 ± 0.30 in)

L : 67.1 ± 7.5 mm (2.64 ± 0.30 in)

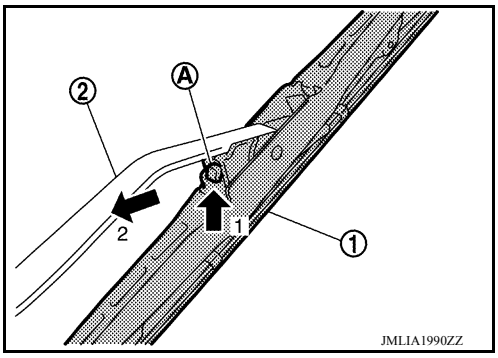
WIPER BLADE

WIPER BLADE : Removal and Installation

INFOID:0000000009269579

REMOVAL

1. Lift up wiper arm and set to the position where wiper arm can be locked back.
2. Press and hold lever (A) of wiper blade (1). Pull in the direction indicated by the arrow as shown and remove wiper blade from wiper arm (2).
   CAUTION:
   Wrap wiper arm using a shop cloth so that wiper blade does not damage windshield glass.



INSTALLATION
Installation is in the reverse order of removal.

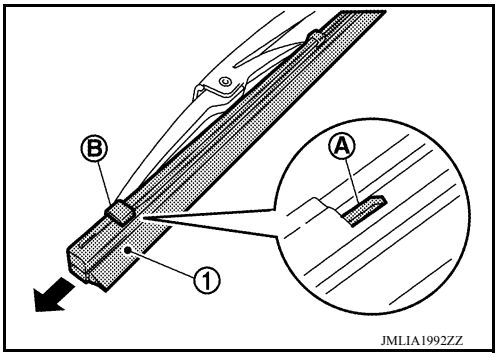
WIPER REFILL

WIPER REFILL : Removal and Installation

INFOID:0000000009269580

REMOVAL

1. Remove wiper blade from the wiper arm. Refer to WW-45, "WIPER BLADE : Removal and Installation".
2. From portion (A) of wiper refill (1), disengage wiper blade portion (B) and remove wiper refill in the direction indicated by the arrow as shown.



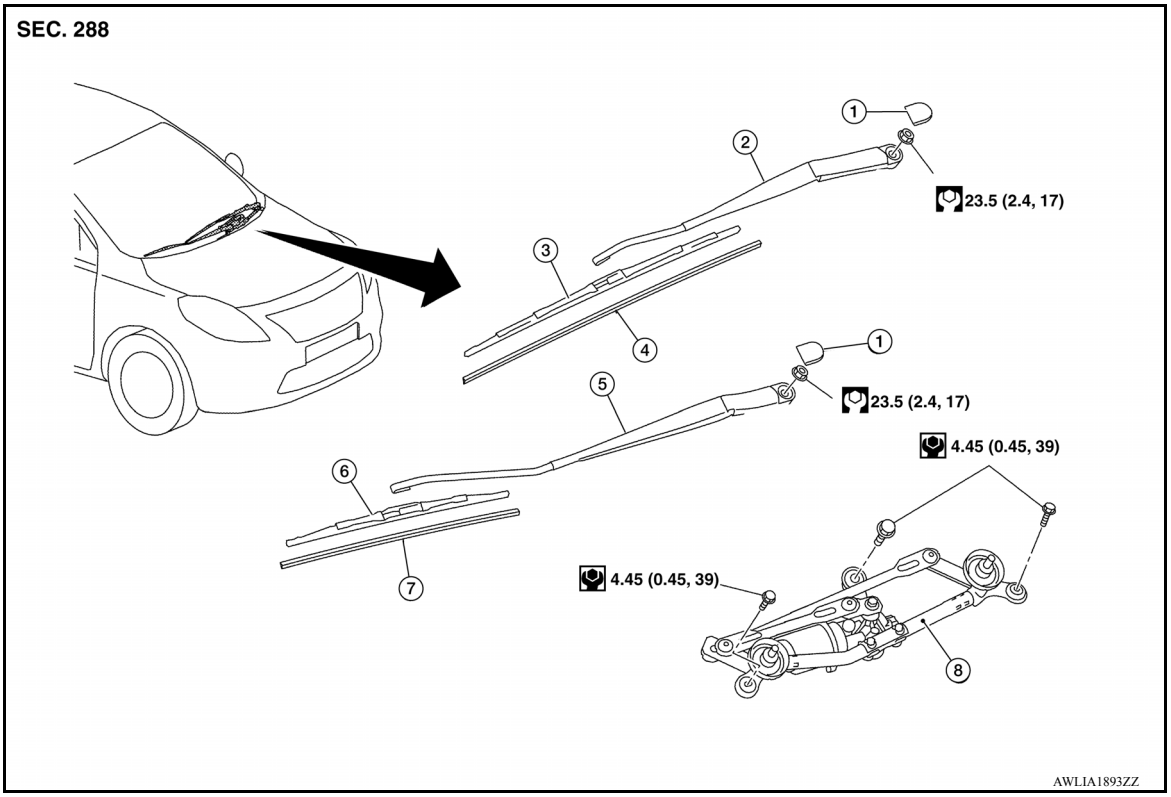
INSTALLATION
Installation is in the reverse order of removal.
CAUTION:
- **For installation of wiper refill, check that wiper refill was not twisted while installing.**
- **Check that wiper refill was inserted normally from the correct direction.**

WIPER DRIVE ASSEMBLY

WIPER DRIVE ASSEMBLY : Removal and Installation

INFOID:0000000009269581

EXPLODED VIEW



1. Wiper arm cap
2. Wiper arm (LH)
3. Wiper blade (LH)
4. Wiper refill (LH)
5. Wiper arm (RH)
6. Wiper blade (RH)
7. Wiper refill (RH)
8. Wiper drive assembly

REMOVAL

1. Remove cowl top cover. Refer to EXT-24, "Removal and Installation".
2. Disconnect the harness connector from the wiper motor.
3. Remove the wiper drive assembly bolts.
4. Remove wiper drive assembly from the vehicle.

INSTALLATION

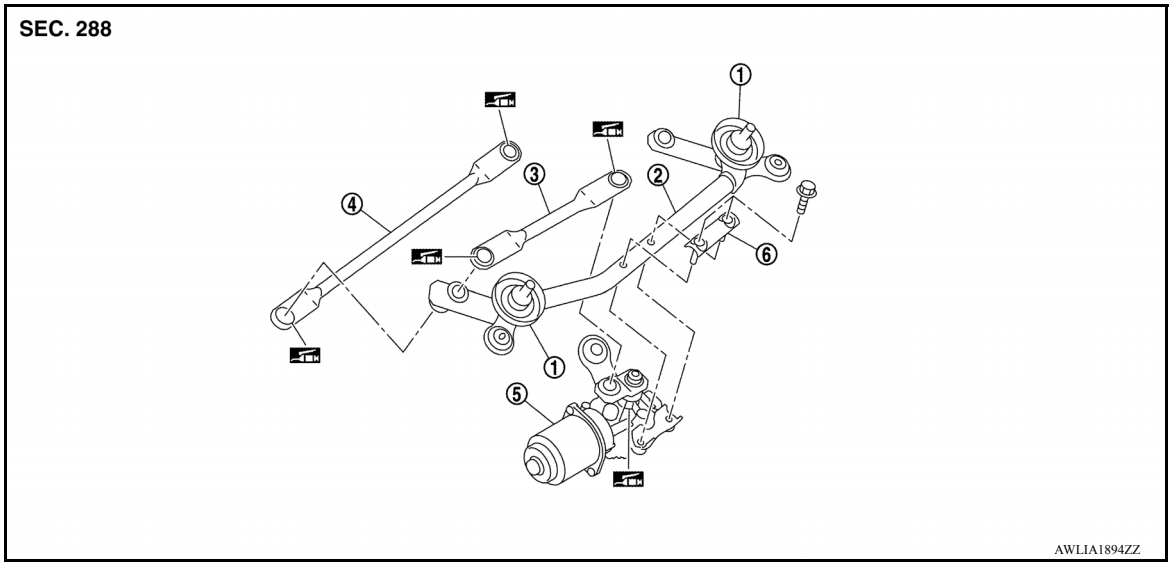
Installation is in the reverse order of removal.

WIPER DRIVE ASSEMBLY : Disassembly and Assembly

INFOID:0000000009269582

EXPLODED VIEW

SEC. 288



1. Shaft seal
2. Wiper frame
3. Wiper linkage 1
4. Wiper linkage 2
5. Wiper motor assembly
6. Wiper motor assembly bracket

DISASSEMBLY

1. Remove wiper linkage 1 and wiper linkage 2 from the wiper frame.
   CAUTION:
   Do not bend the linkage or damage the plastic part of the ball joint when removing the wiper linkage.
2. Remove wiper motor screws.
3. Remove the wiper motor from the wiper frame.

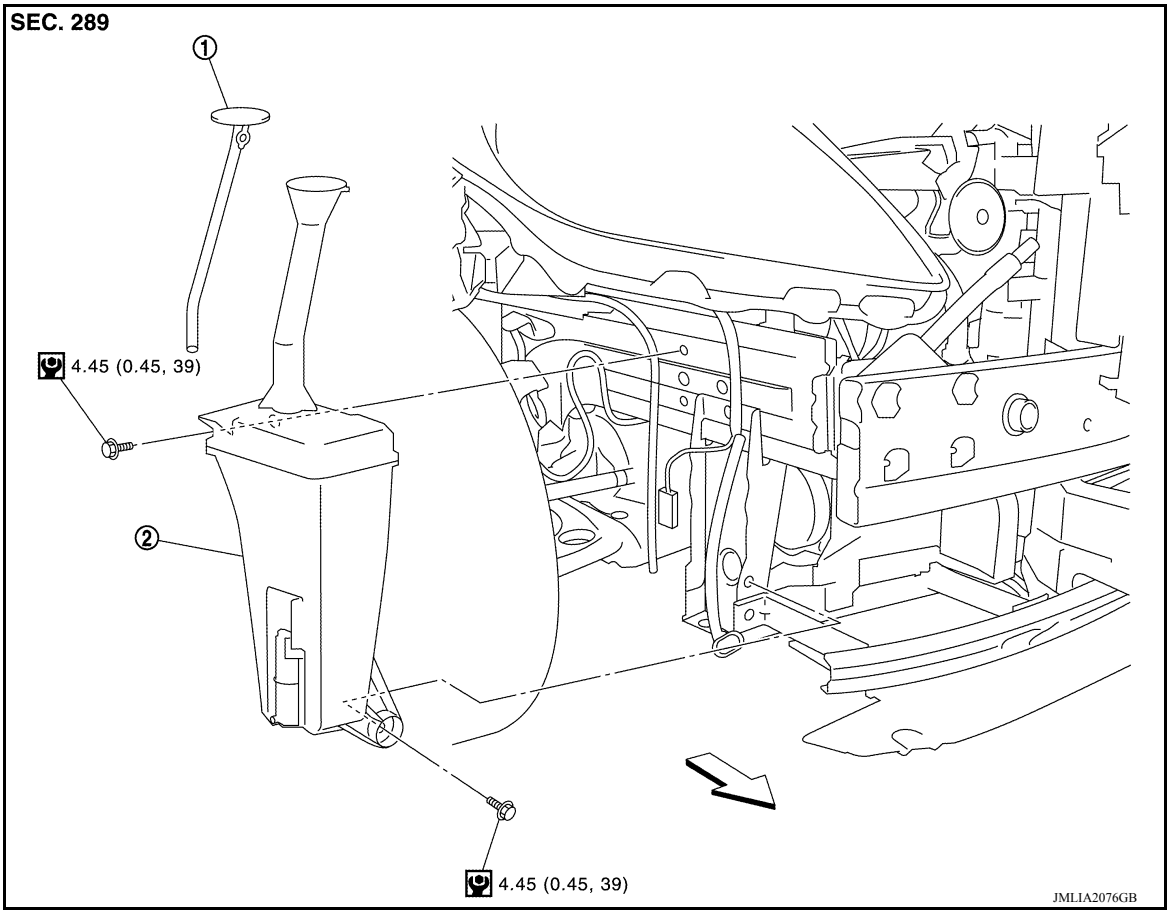
ASSEMBLY

1. Connect the harness connector to the wiper motor.
2. Operate wiper to move it to the auto stop position.
3. Disconnect the harness connector from the wiper motor.
4. Install wiper motor to wiper frame.
5. Install wiper linkage 1 to the wiper motor and the wiper frame.
6. Install wiper linkage 2 to the wiper frame.
   CAUTION:
   - **Do not drop wiper motor or cause it to come into contact with other parts.**
   - **Be careful of the grease condition at the wiper motor and wiper linkage joint (retainer). Apply multi−purpose grease or an equivalent if necessary.**

WASHER TANK

Exploded View

INFOID:0000000009269583



1. Washer tank inlet cap
2. Washer tank assembly
⇦ Front

Removal and Installation

INFOID:0000000009269584

REMOVAL

1. Remove fender protector. Refer to EXT-26, "Removal and Installation".
2. Disconnect the harness connector from the washer pump.
3. Remove front washer tube.
4. Remove washer tank assembly bolts.
5. Remove washer tank assembly from the vehicle.

INSTALLATION

Installation is in the reverse order of removal.

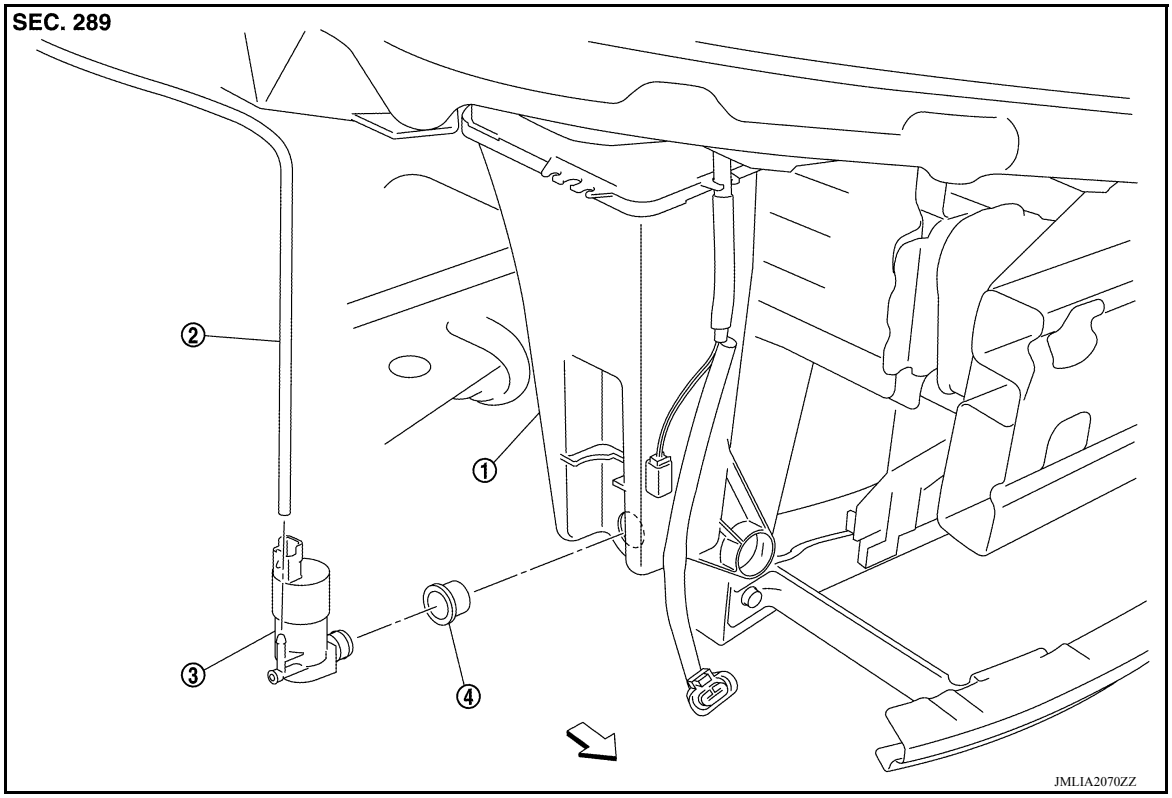
NOTE:

- After installation, add water to the top of the washer tank inlet to check that no leaks exist.
- Fill washer tank with specified amount of fluid. Refer to WW-56, "Specifications".

WASHER PUMP

Exploded View

INFOID:0000000009269585



1. Washer tank
2. Front washer tube
3. Washer pump
4. Seal
⇦ Front

Removal and Installation

INFOID:0000000009269586

REMOVAL

1. Remove fender protector. Refer to EXT-26, "Removal and Installation".
2. Disconnect the harness connector from the washer pump.
3. Remove front washer tube.
4. Remove washer pump from the washer tank assembly.
5. Remove seal from the washer tank assembly.

INSTALLATION

Installation is in the reverse order of removal.

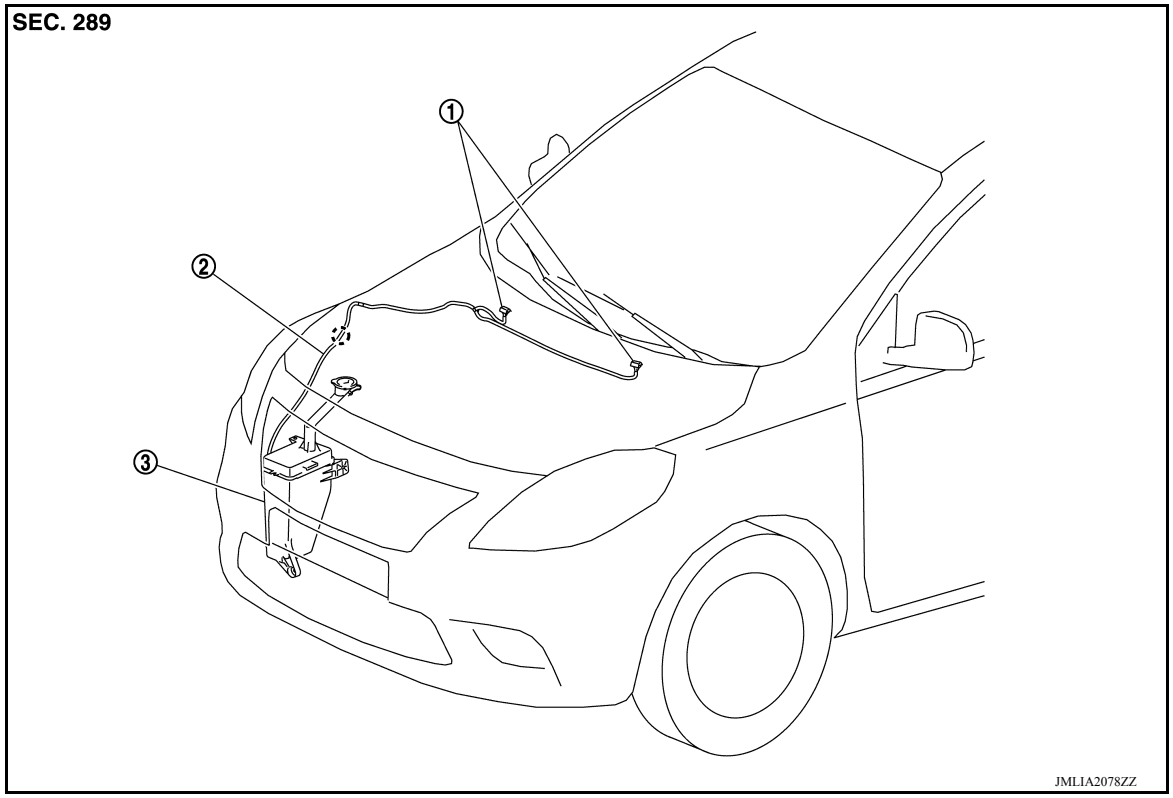
CAUTION:

Do not twist or damage the seal when installing the washer pump.

WASHER NOZZLE & TUBE

Washer System Layout

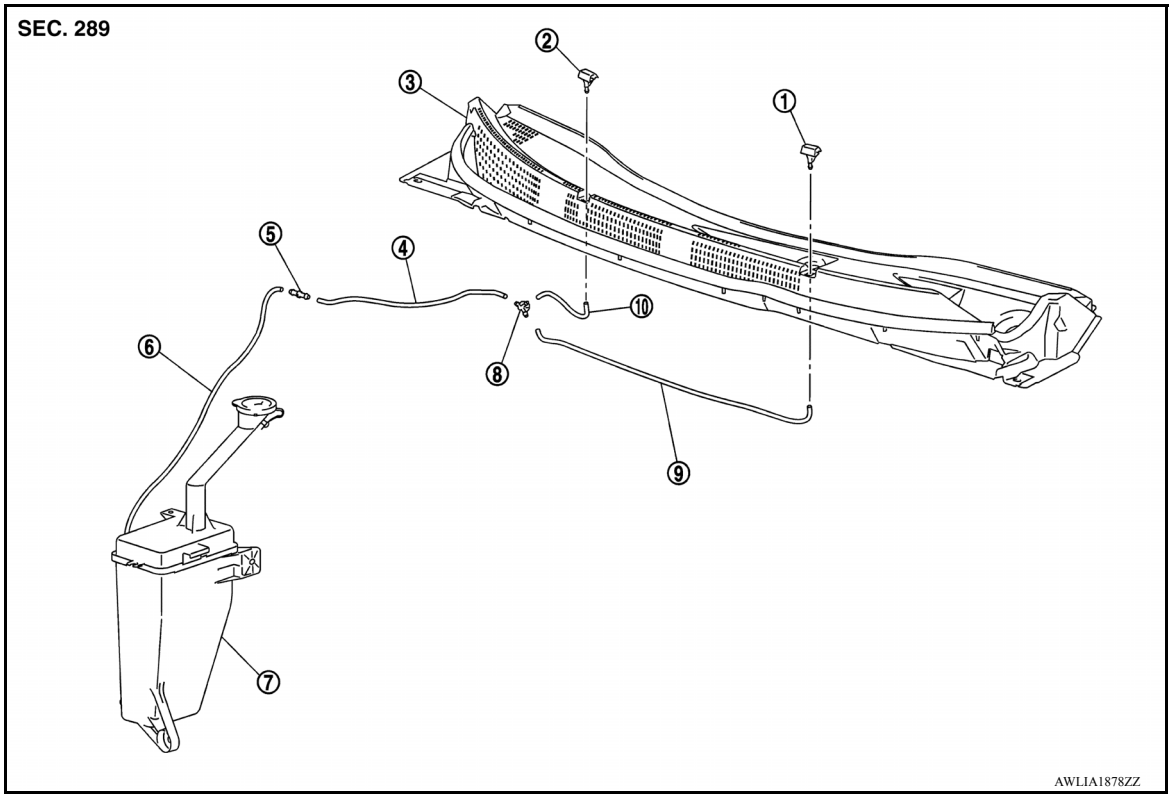
INFOID:0000000009269587



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

Exploded View

INFOID:0000000009269588



1. Front washer nozzle (LH)
2. Front washer nozzle (RH)
3. Cowl top cover
4. Front washer tube B
5. Joint
6. Front washer tube A
7. Washer tank assembly
8. Check valve
9. Front washer tube C
10. Front washer tube D

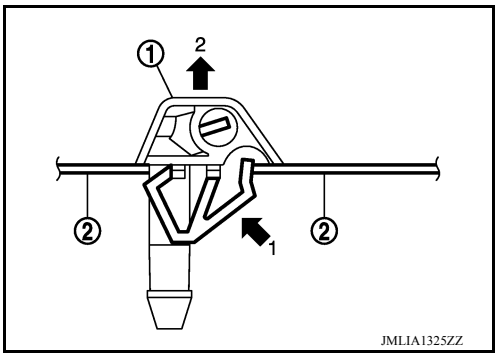
WASHER NOZZLE

WASHER NOZZLE : Removal and Installation

INFOID:0000000009269589

REMOVAL

1. Remove cowl top cover. Refer to EXT-24, "Removal and Installation".
2. Disconnect washer tube from washer nozzle (1).
3. Place cowl top cover (2) up side down, then release washer nozzle pawl to remove as shown.



INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- **The spray positions differ, check that left and right nozzles are installed correctly.**
- **Adjust the nozzle spray pattern. Refer to WW-53, "WASHER NOZZLE : Inspection and Adjustment".**

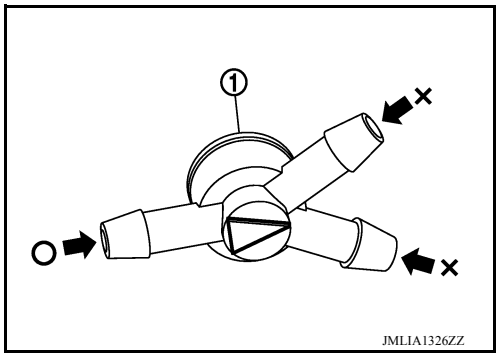
WASHER NOZZLE : Inspection and Adjustment

INFOID:0000000009269590

INSPECTION

Check valve Inspection

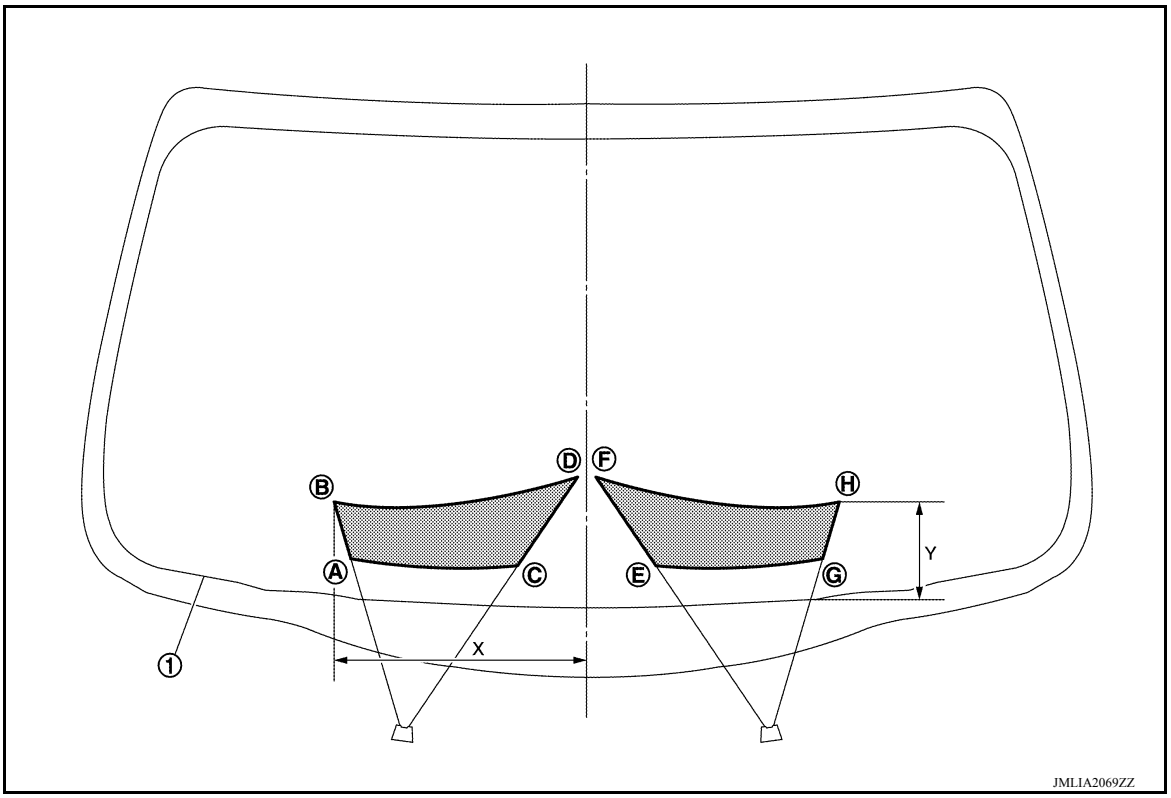
Check that air can pass through the nozzle by blowing into the nozzle and that air cannot flow in the opposite direction.



ADJUSTMENT

Washer Nozzle Spray Position Adjustment

Adjust spray positions to match the positions shown.



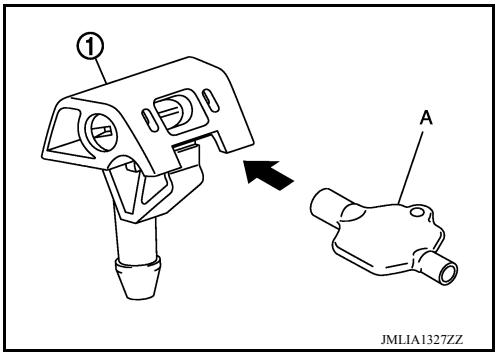
1. Black printed frame line

: Spray area

Unit: mm (in)

	Passenger side				Driver side			
	A	B	C	D	E	F	G	H
X	321 (12.64)	343 (13.50)	60 (2.36)	5 (0.20)	60 (2.36)	5 (0.20)	321 (12.64)	343 (13.50)
Y	62 (2.44)	129 (5.08)	80 (3.15)	184 (7.24)	80 (3.15)	184 (7.24)	62 (2.44)	129 (5.08)

1. If washer nozzle (1) spray pattern is not within specification adjust using suitable tool (A).
   CAUTION:
   Do not use needle or small pin to adjust the washer nozzle.
   NOTE:
   - Washer nozzle adjuster is included with shipment of washer nozzle.
   - If wax or dust gets into the nozzle, remove wax or dust with a needle or small pin.



WASHER TUBE

WASHER TUBE : Removal and Installation

INFOID:0000000009269591

REMOVAL

1. Remove front washer tube from the washer pump. Refer to WW-49, "Removal and Installation".
2. Remove front washer tube from the front washer nozzle. Refer to WW-52, "WASHER NOZZLE : Removal and Installation".
3. Remove front washer tube clip.
4. Remove front washer tube from the vehicle.

INSTALLATION

Installation is in the reverse order of removal.

WIPER AND WASHER SWITCH

Removal and Installation

INFOID:0000000009269592

The wiper and washer switch is serviced as an assembly with the combination switch. Refer to EXL-107, "Removal and Installation".

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Specifications

INFOID:0000000009269593

WINDSHIELD WASHER FLUID

Windshield washer fluid capacity	3.5 ℓ (3 3/4 US qt, 3 1/8 Imp qt)
Windshield washer fluid specification	Refer to MA-12, "Fluids and Lubricants".