SECTION WW
WIPER & WASHER

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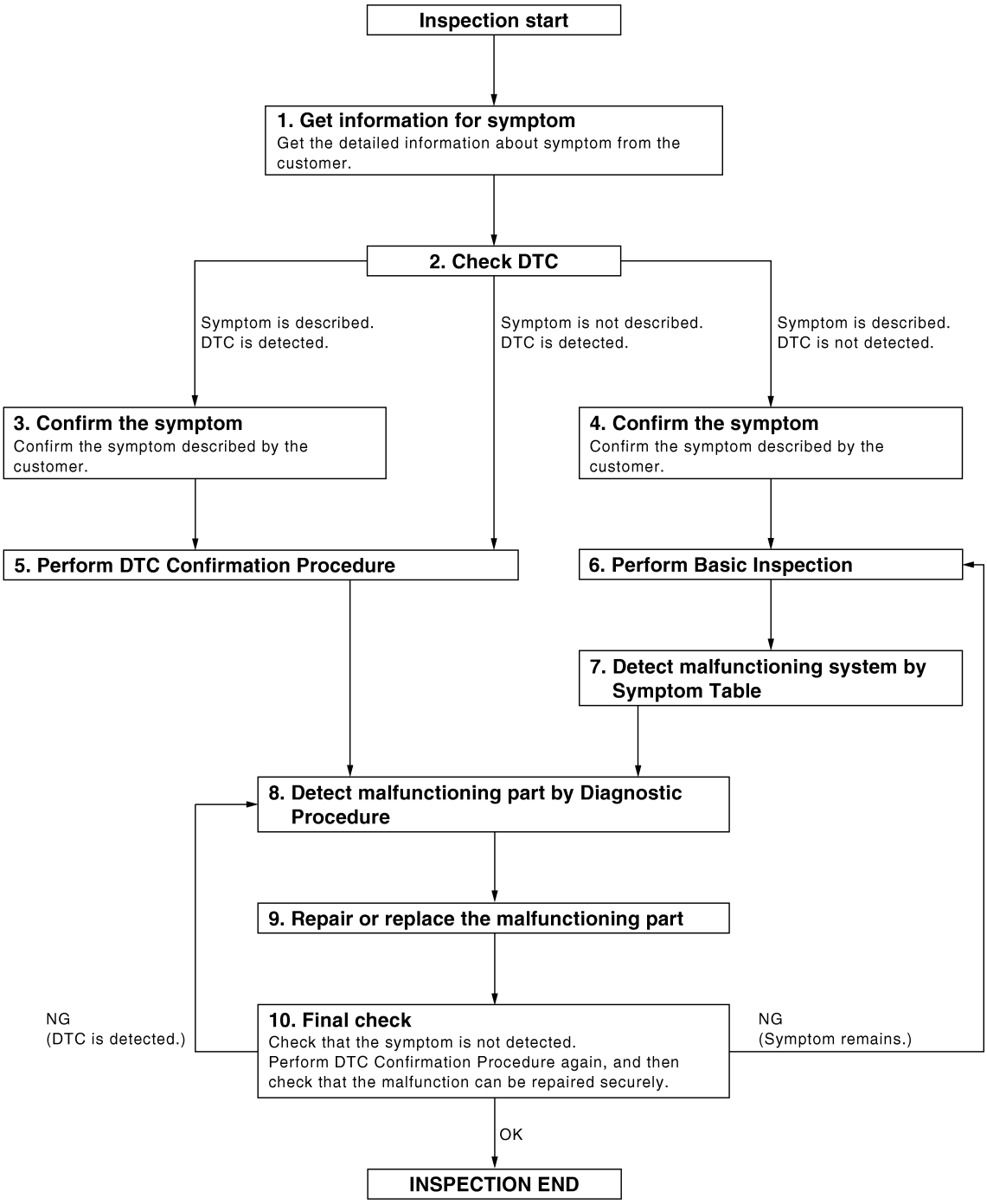
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000001723066

OVERALL SEQUENCE



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DETAILED FLOW

1. GET INFORMATION FOR SYMPTOM

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred).

>> GO TO 2

2. CHECK DTC

1. Check DTC.
2. Perform the following procedure if DTC is displayed.
- Record DTC and freeze frame data (Print them out with CONSULT-III.)
- Erase DTC.
- Study the relationship between the cause detected by DTC and the symptom described by the customer.
3. Check related service bulletins for information.

Is any symptom described and any DTC detected?

Symptom is described, DTC is displayed>>GO TO 3
Symptom is described, DTC is not displayed>>GO TO 4
Symptom is not described, DTC is displayed>>GO TO 5

3. CONFIRM THE SYMPTOM

Confirm the symptom described by the customer.
Connect CONSULT-III to the vehicle in “DATA MONITOR” mode and check real time diagnosis results.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 5

4. CONFIRM THE SYMPTOM

Confirm the symptom described by the customer.
Connect CONSULT-III to the vehicle in “DATA MONITOR ” mode and check real time diagnosis results.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 6

5. PERFORM DTC CONFIRMATION PROCEDURE

Perform DTC Confirmation Procedure for the displayed DTC, and then check that DTC is detected again.
At this time, always connect CONSULT-III to the vehicle, and check diagnostic results in real time.
If two or more DTCs are detected, refer to BCS-83, "DTC Inspection Priority Chart" and determine trouble diagnosis order.

NOTE:

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

Is DTC detected?

YES >> GO TO 8
NO >> Refer to GI-42, "Intermittent Incident".

6. PERFORM BASIC INSPECTION

Perform WW-3, "Work Flow".

Inspection End>>GO TO 7

7. DETECT MALFUNCTIONING SYSTEM BY SYMPTOM TABLE

Detect malfunctioning system according to WW-36, "Diagnosis Procedure" based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptom.

>> GO TO 8

8. DETECT MALFUNCTIONING PART BY DIAGNOSTIC PROCEDURE

Inspect according to Diagnostic Procedure of the system.

NOTE:

The Diagnostic Procedure described based on open circuit inspection. A short circuit inspection is also required for the circuit check in the Diagnostic Procedure.

Is malfunctioning part detected?

YES >> GO TO 9
NO >> Check voltage of related BCM terminals using CONSULT-III.

9. REPAIR OR REPLACE THE MALFUNCTIONING PART

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

>> GO TO 10

10. FINAL CHECK

When DTC was detected in step 2, perform DTC Confirmation Procedure or Component Function Check again, and then check that the malfunction have been repaired securely.

When symptom was described from the customer, refer to confirmed symptom in step 3 or 4, and check that the symptom is not detected.

Does the symptom reappear?

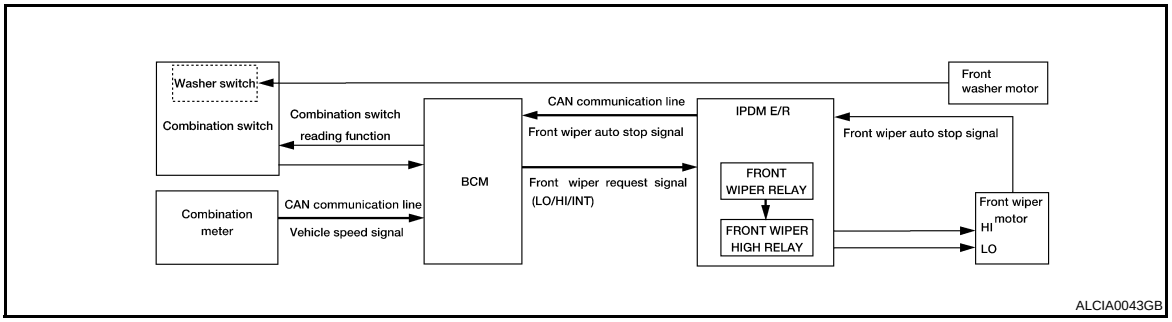
YES (DTC is detected)>>GO TO 8
YES (Symptom remains)>>GO TO 6
NO >> Inspection End.

FUNCTION DIAGNOSIS

FRONT WIPER AND WASHER SYSTEM

System Diagram

INFOID:0000000001723067



System Description

INFOID:0000000001723068

OUTLINE

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

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

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

FRONT WIPER BASIC OPERATION

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

FRONT WIPER LO OPERATION

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

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

FRONT WIPER HI OPERATION

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

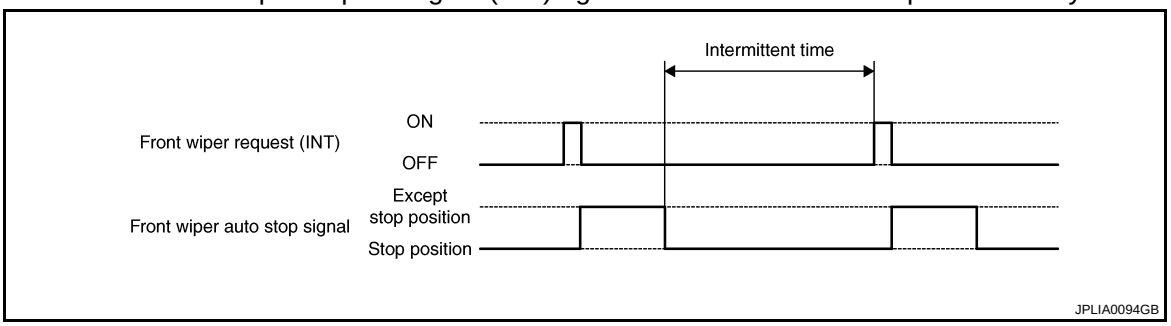
Front wiper HI operating condition
- Ignition switch ON
- Front wiper switch HI
- IPDM E/R turns ON the integrated front wiper relay and the front wiper high relay according to the front wiper request signal (HI).

FRONT WIPER INT OPERATION

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

Front wiper INT operating condition
- 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 auto stop signal received from IPDM E/R with 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 the operation with vehicle speed by CONSULT-III. Refer to WW-11, "WIPER : CONSULT - III Function (BCM - WIPER)".

Front wiper intermittent operation with vehicle speed

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

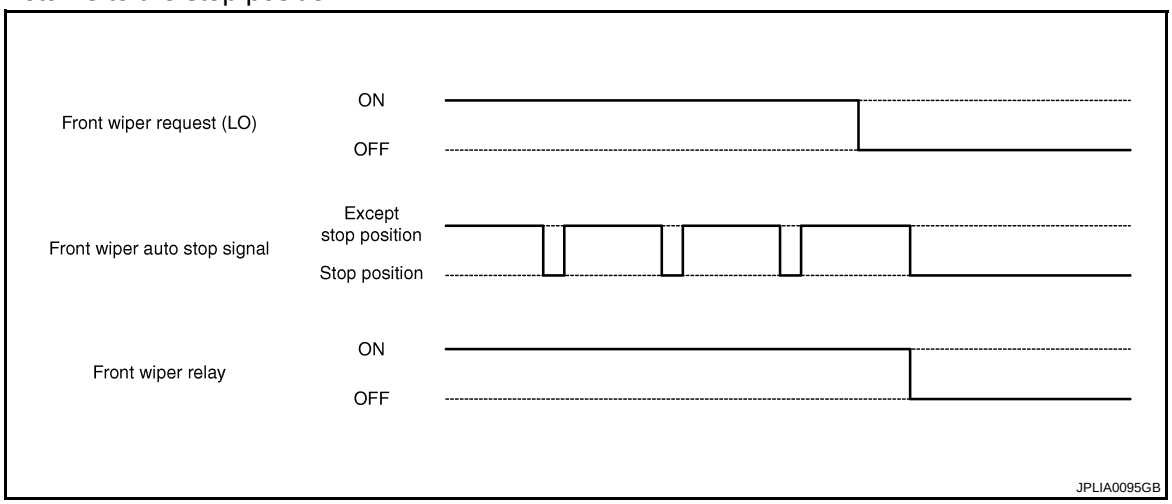
Wiper intermittent dial position	Intermittent operation interval	Intermittent operation delay Interval (s)			
		Vehicle speed			
		Vehicle stopped or less than 5 km/h (3.1 MPH)	5 km/h (3.1MPH) or more or less than 35km/h (21.7 MPH)	35 km/h (21.7 MPH) or more or less than 65km/h (40.4 MPH)*	65 km/h (40.4MPH)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

*: When without vehicle speed setting

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 auto stop 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 OFF.
- IPDM E/R turns the front wiper relay OFF when the ignition switch OFF.

FRONT WIPER OPERATION LINKED WITH WASHER

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

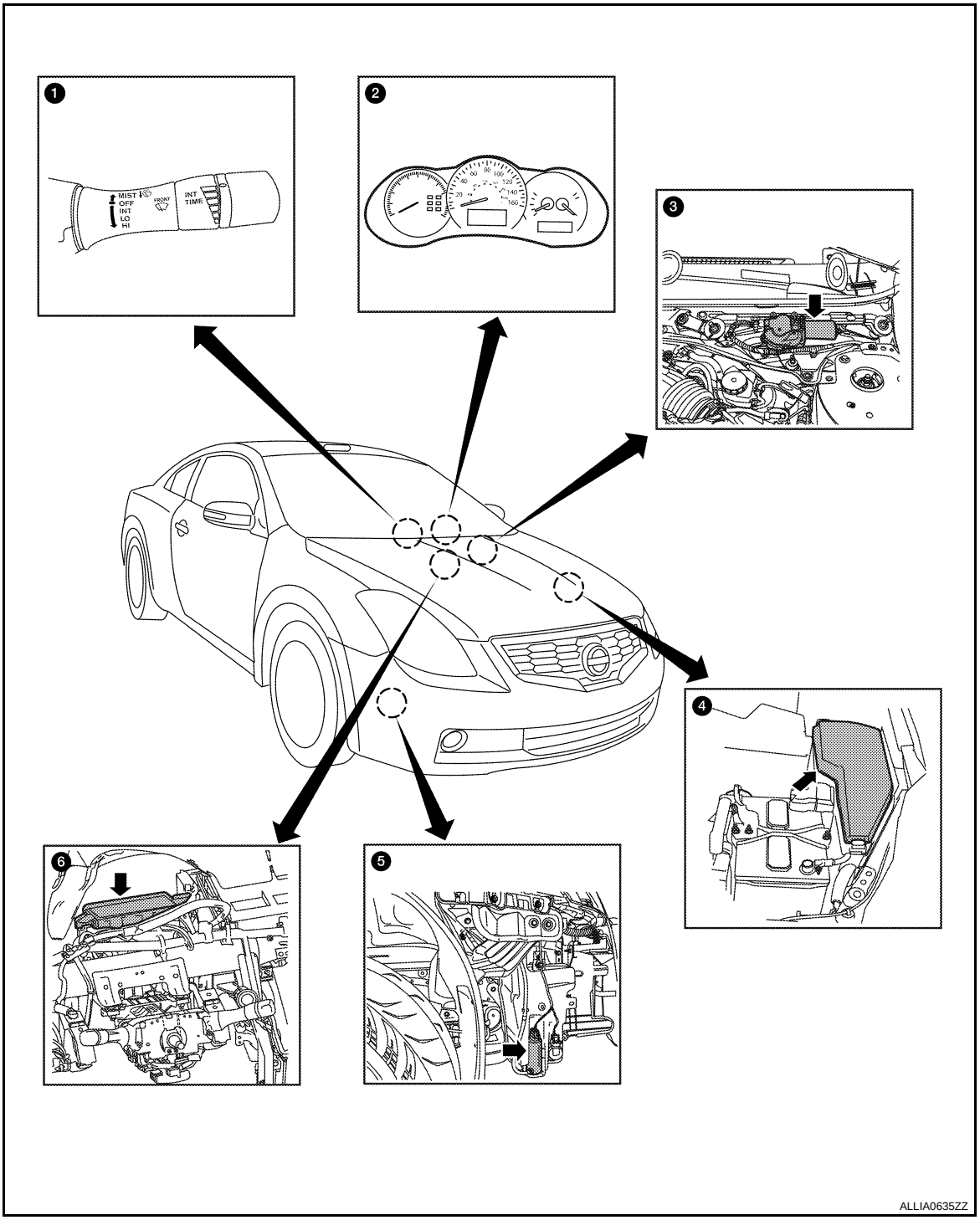
- IPDM E/R turns ON the integrated front wiper relay according to the front wiper request signal (LO).
- The front washer motor is grounded through the combination switch when the front washer switch is ON.

FRONT WIPER FAIL–SAFE OPERATION

When the front wiper auto stop circuit is malfunctioning, IPDM E/R performs the fail-safe function. Refer to PCS-39, "Fail Safe".

Component Parts Location

INFOID:0000000001723069



1. Combination switch M28 (coupe shown, sedan similar)
2. Combination meter M24
3. Front wiper motor E25
4. IPDM E/R E17, E18, E200
5. Front washer motor E226
6. BCM M16, M17, M18, M19 (view with instrument panel removed)

Component Description

INFOID:0000000001723070

Part	Description
BCM	• Judges the switch status by the combination switch reading function. • Requests (with CAN communication) the front wiper relay and the front wiper high relay ON to IPDM E/R.
IPDM E/R	• Controls the integrated relay according to the request (with CAN communication) from BCM. • Performs the auto stop control of the front wiper.
Combination switch (Wiper & washer switch)	Refer to WW-6, "System Description".
Combination meter	Transmits the vehicle speed signal to BCM with CAN communication.

DIAGNOSIS SYSTEM (BCM)
COMMON ITEM
COMMON ITEM : Diagnosis Description

INFOID:0000000001723071

BCM CONSULT-III FUNCTION
CONSULT-III performs the following functions via CAN communication with BCM.

Diagnosis mode	Function Description
WORK SUPPORT	Changes the setting for each system function.
SELF-DIAG RESULTS	Displays the diagnosis results judged by BCM.
CAN DIAG SUPPORT MNTR	Monitors the reception status of CAN communication viewed from BCM.
DATA MONITOR	The BCM input/output signals are displayed.
ACTIVE TEST	The signals used to activate each device are forcibly supplied from BCM.
ECU IDENTIFICATION	The BCM part number is displayed.
CONFIGURATION	This function is not used even though it is displayed.

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

System	Sub system selection item	Diagnosis mode		
		WORK SUPPORT	DATA MONITOR	ACTIVE TEST
Wiper and washer	WIPER	×	×	×
Combination switch	COMB SW		×	

COMMON ITEM : CONSULT-III Function

INFOID:0000000001723072

ECU IDENTIFICATION
Displays the BCM part No.

SELF-DIAG RESULT
Refer to BCS-85, "DTC Index".

WIPER
WIPER : CONSULT - III Function (BCM - WIPER)

INFOID:0000000001723073

WORK SUPPORT

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

*:Factory setting

DATA MONITOR

Monitor Item [Unit]	Description
PUSH SW	Displays the status of the engine switch (push switch) judged by BCM.
VEH SPEED 1 [km/h]	Displays the value of the vehicle speed signal received from combination meter with CAN communication.
FR WIPER HI [OFF/ON]	Status of each switch judged by BCM using the combination switch reading function
FR WIPER LOW [OFF/ON]	
FR WASHER SW [OFF/ON]	
FR WIPER INT [OFF/ON]	
FR WIPER STOP [OFF/ON]	Displays the status of the front wiper auto stop signal received from IPDM E/R with CAN communication.
INT VOLUME [1 – 7]	Status of each switch judged by BCM using the combination switch reading function

ACTIVE TEST

Test item	Operation	Description
FRONT WIPER	HI	Transmits the front wiper request signal (HI) to IPDM E/R with CAN communication to operate the front wiper HI operation.
	LO	Transmits the front wiper request signal (LO) to IPDM E/R with CAN communication to operate the front wiper LO operation.
	INT	Transmits the front wiper request signal (INT) to IPDM E/R with CAN communication to operate the front wiper INT operation.
	OFF	Stops transmitting the front wiper request signal to stop the front wiper operation.

DIAGNOSIS SYSTEM (IPDM E/R)

Diagnosis Description

INFOID:0000000001723074

AUTO ACTIVE TEST

Refer to PCS-10, "Diagnosis Description".

CONSULT - III Function (IPDM E/R)

INFOID:0000000001723075

APPLICATION ITEM

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

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

SELF DIAGNOSTIC

Refer to PCS-41, "DTC Index".

DATA MONITOR

Monitor item

Monitor Item [Unit]	MAIN SIGNALS	Description
FR WIP REQ [Stop/1LOW/Low/Hi]	×	Displays the status of the front wiper request signal received from BCM via CAN communication.
WIP AUTO STOP [STOP P/ACT P]	×	Displays the status of the front wiper auto stop signal judged by IPDM E/R.
WIP PROT [Off/BLOCK]	×	Displays the status of the front wiper fail-safe operation judged by IPDM E/R.

ACTIVE TEST

Test item

Test item	Operation	Description
FRONT WIPER	OFF	OFF
	LO	Operates the front wiper relay.
	HI	Operates the front wiper relay and front wiper high relay.

COMPONENT DIAGNOSIS

WIPER AND WASHER FUSE

Description

INFOID:0000000001723076

Fuse list

Unit	Location	Fuse No.	Capacity
Front wiper motor	IPDM E/R	55	30 A
Front washer motor	IPDM E/R	38	10 A

Diagnosis Procedure

INFOID:0000000001723077

1. CHECK FUSES

Check that the following fuses are not blown.

Unit	Location	Fuse No.	Capacity
Front wiper motor	IPDM E/R	55	30 A
Front washer motor	IPDM E/R	38	10 A

Is the fuse blown?

YES >> Replace the blown fuse after repairing the affected circuit.
NO >> The fuse is normal.

FRONT WIPER MOTOR LO CIRCUIT

Component Function Check

INFOID:0000000001723078

1. CHECK FRONT WIPER LO OPERATION

IPDM E/R AUTO ACTIVE TEST
1. Start IPDM E/R auto active test. Refer to PCS-10, "Diagnosis Description".
2. Check that the front wiper operates at the LO operation.

CONSULT-III ACTIVE TEST
1. Select "FRONT WIPER" of IPDM E/R active test item.
2. With operating the test item, check that front wiper LO operation and OFF.

LO : Front wiper LO operation
OFF : Stop the front wiper.

Does the front wiper operate?

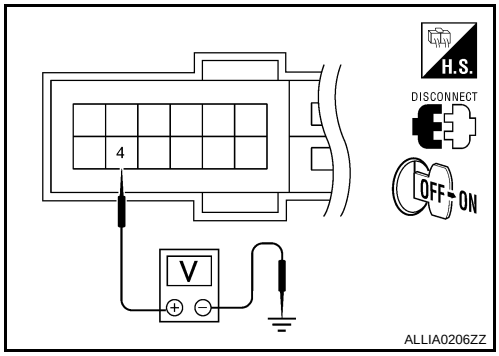
YES >> Front wiper motor LO circuit is normal.
NO >> Refer to WW-15, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000001723079

1. CHECK FRONT WIPER MOTOR (LO) OUTPUT VOLTAGE

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



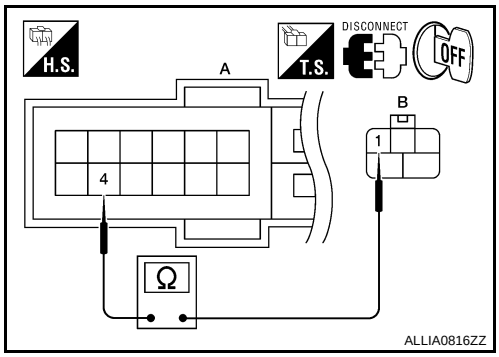
Terminals			Test item	Voltage (V) (Approx.)
(+)		(-)		
IPDM E/R		Ground	FRONT WIPER	
Connector	Terminal			
E18	4		LO	Battery voltage
			OFF	0V

Is the measurement normal?

YES >> GO TO 2
NO >> Replace IPDM E/R. Refer to PCS-43, "Removal and Installation".

2. CHECK FRONT WIPER MOTOR (LO) OPEN CIRCUIT

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



IPDM E/R		Front wiper motor		Continuity
Connector	Terminal	Connector	Terminal	
E18 (A)	4	E25 (B)	1	Yes

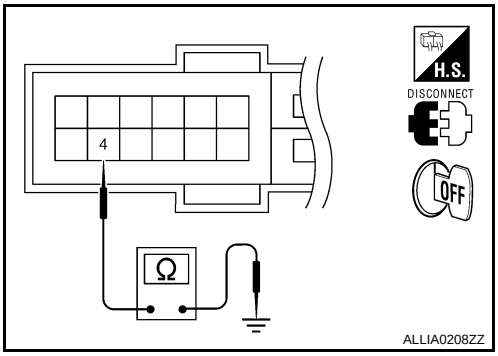
Does continuity exist?

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

3. CHECK FRONT WIPER MOTOR (LO) SHORT CIRCUIT

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

IPDM E/R		Ground	Continuity
Connector	Terminal		
E18	4		No



Does continuity exist?

YES >> Repair or replace harness.
NO >> Replace front wiper motor. Refer to WW-41, "FRONT WIPER DRIVE ASSEMBLY : Removal and Installation".

FRONT WIPER MOTOR HI CIRCUIT

Component Function Check

INFOID:0000000001723080

1. CHECK FRONT WIPER HI OPERATION

IPDM E/R AUTO ACTIVE TEST
1. Start IPDM E/R auto active test. Refer to PCS-10, "Diagnosis Description".
2. Check that the front wiper operates at the HI operation.

CONSULT-III ACTIVE TEST
1. Select "FRONT WIPER" of IPDM E/R active test item.
2. With operating the test item, check that front wiper HI operation and OFF.

HI : Front wiper HI operation
OFF : Stop the front wiper.

Does the front wiper operate?

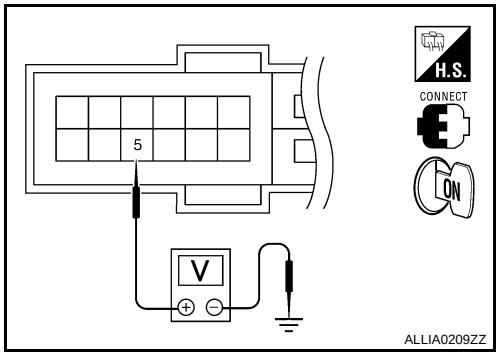
YES >> The front wiper motor HI circuit is normal.
NO >> Refer to WW-15, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000001723081

1. CHECK FRONT WIPER MOTOR (HI) OUTPUT VOLTAGE

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



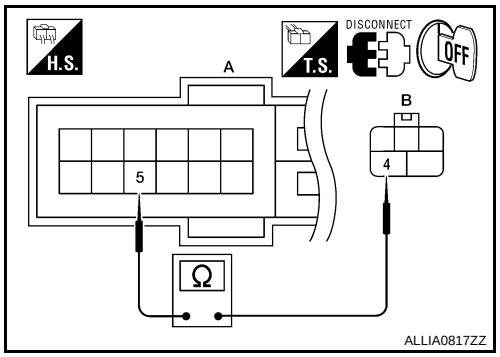
Terminals			Test item	Voltage (V) (Approx.)
(+)		(-)		
IPDM E/R		Ground	FRONT WIPER	
Connector	Terminal			
E18	5		HI	Battery voltage
			OFF	0V

Is the measurement normal?

YES >> GO TO 2
NO >> Replace IPDM E/R. Refer to PCS-43, "Removal and Installation".

2. CHECK FRONT WIPER MOTOR (HI) OPEN CIRCUIT

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



IPDM E/R		Front wiper motor		Continuity
Connector	Terminal	Connector	Terminal	
E18 (A)	5	E25 (B)	4	Yes

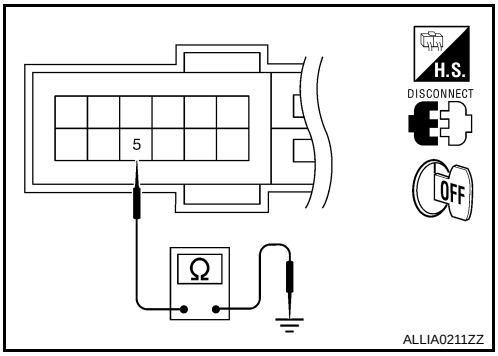
Does continuity exist?

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

3. CHECK FRONT WIPER MOTOR (HI) SHORT CIRCUIT

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

IPDM E/R		Ground	Continuity
Connector	Terminal		
E18	5		No



Does continuity exist?

YES >> Repair or replace harness.
NO >> Replace front wiper motor. Refer to WW-41, "FRONT WIPER DRIVE ASSEMBLY : Removal and Installation".

FRONT WIPER AUTO STOP SIGNAL CIRCUIT

Component Function Check

INFOID:0000000001723082

1. CHECK FRONT WIPER (AUTO STOP) OPERATION

CONSULT-III DATA MONITOR
1. Select "FRONT WIPER STOP" of IPDM E/R DATA MONITOR item.
2. Operate the front wiper.
3. With the front wiper operation, check the monitor status.

Monitor item	Condition		Monitor status
FR WIPER STOP	Front wiper motor	Stop position	STOP P
		Except	ACT P

Is the status of item normal?

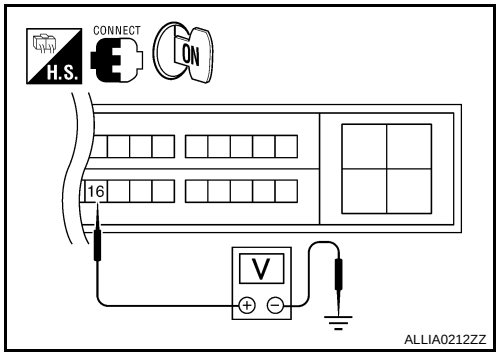
YES >> Auto stop signal circuit is normal.
NO >> Refer to WW-19, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000001723083

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

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



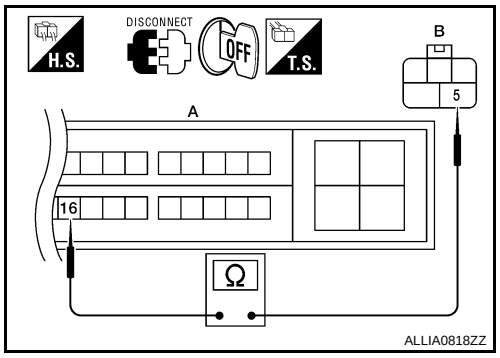
Terminals			Voltage (V) (Approx.)
(+)		(-)	
IPDM E/R		Ground	
Connector	Terminal		
E18	16		Battery voltage

Is the measurement normal?

YES >> GO TO 2
NO >> Replace IPDM E/R. Refer to PCS-43, "Removal and Installation".

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

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



IPDM E/R		Front wiper motor		Continuity
Connector	Terminal	Connector	Terminal	
E18 (A)	16	E25 (B)	5	Yes

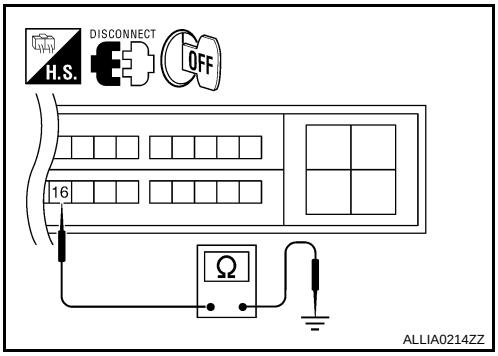
Does continuity exist?

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

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

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

IPDM E/R		Ground	Continuity
Connector	Terminal		
E18	16		No



Does continuity exist?

YES >> Repair or replace harness.
NO >> Replace front wiper motor. Refer to WW-41, "FRONT WIPER DRIVE ASSEMBLY : Removal and Installation".

FRONT WIPER MOTOR GROUND CIRCUIT

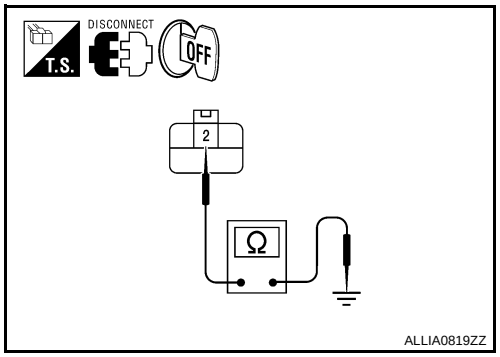
Diagnosis Procedure

INFOID:0000000001723084

1.CHECK FRONT WIPER MOTOR (GND) OPEN 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		
E25	2		Yes



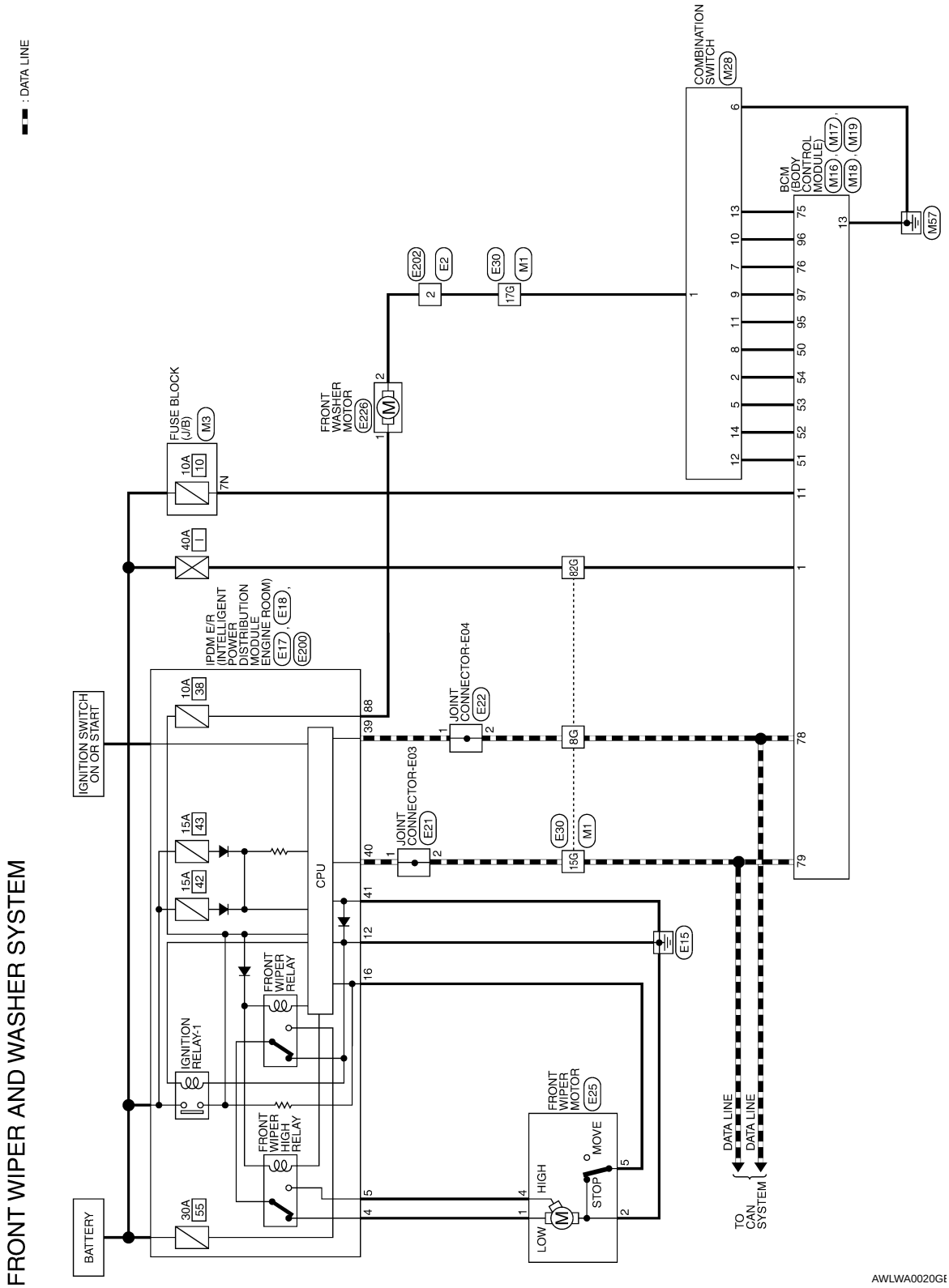
Does continuity exist?

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

FRONT WIPER AND WASHER SYSTEM

Wiring Diagram-Coupe

INFOID:0000000001723085



FRONT WIPER AND WASHER SYSTEM CONNECTORS

Connector No.	M1
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
8G	P	—
15G	L	—
17G	R/L	—
82G	W/B	—

Connector No.	M3
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
7N	Y/B	—

Connector No.	M16
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	W/B	BAT_POWER_F/L

Connector No.	M17
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
11	Y/R	BAT_BCM_FUSE
13	B	GND1

Connector No.	M18
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	GREEN

H.S.

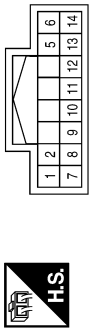
Terminal No.	Color of Wire	Signal Name
50	LG/B	INPUT_5
51	L/W	INPUT_1
52	G/B	INPUT_2
53	LG/R	INPUT_3
54	G/Y	INPUT_4

ALLIA0046GB

Connector No.	M19
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	BLACK

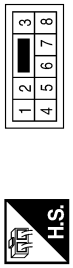
Terminal No.	Color of Wire	Signal Name
75	R/Y	OUTPUT_5
76	R/G	OUTPUT_3
78	P	CAN-L
79	L	CAN-H
95	R/W	OUTPUT_1
96	P/B	OUTPUT_4
97	R/B	OUTPUT_2

Connector No.	M28
Connector Name	COMBINATION SWITCH
Connector Color	WHITE



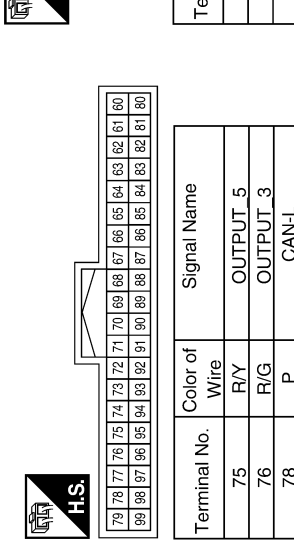
Terminal No.	Color of Wire	Signal Name
1	R/L	WASH_MTR
2	G/Y	OUTPUT_4
3	—	—
4	—	—
5	LG/R	OUTPUT_3
6	B	GND
7	R/G	INPUT_3
8	LG/B	OUTPUT_5
9	R/B	INPUT_2
10	P/B	INPUT_4
11	R/W	INPUT_1
12	L/W	OUTPUT_1
13	R/Y	INPUT_5
14	G/B	OUTPUT_2

Connector No.	E2
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
2	R/L	—

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



Terminal No.	Color of Wire	Signal Name
4	L/R	FR_WIPER_LO
5	L/B	FR_WIPER_HI
12	B	P-GND
16	L/Y	WIPER_AUTOSTOP

Connector No.	E17
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE

Terminal No.	Color of Wire	Signal Name
39	P	CAN-L
40	L	CAN-H
41	B	S-GND

AWLIA0150GB

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	L/R	—
2	B/Y	—
3	—	—
4	L/B	—
5	L/Y	—

Connector No.	E22
Connector Name	JOINT CONNECTOR-E04
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	P	—
2	P	—

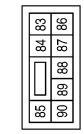
Connector No.	E21
Connector Name	JOINT CONNECTOR-E03
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	L	—
2	L	—

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

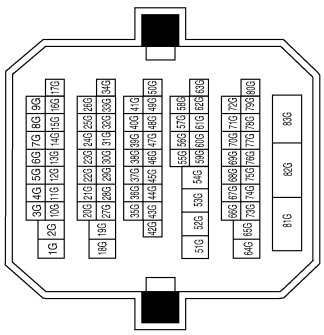
H.S.



Terminal No.	Color of Wire	Signal Name
88	R/W	WASHER_MTR

Connector No.	E30
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

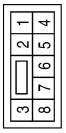


Terminal No.	Color of Wire	Signal Name
8G	P	—
15G	L	—
17G	R/L	—
82G	G	—

AWLIA0151GB

Connector No.	E202
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
2	R/L	—

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

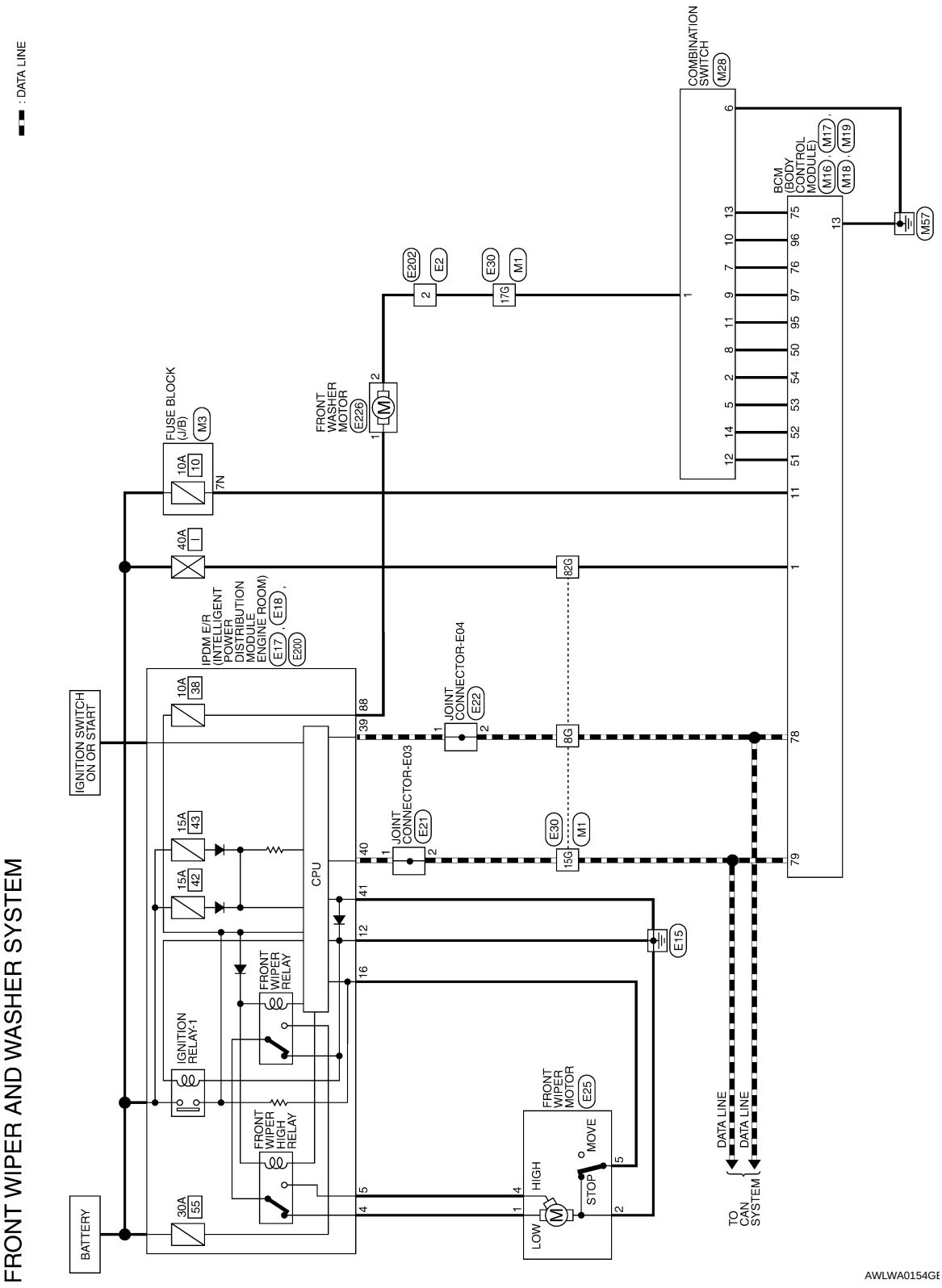
H.S.

Terminal No.	Color of Wire	Signal Name
1	R/W	—
2	R/L	—

ALLIA0049GB

Wiring Diagram-Sedan

INFOID:0000000003188079

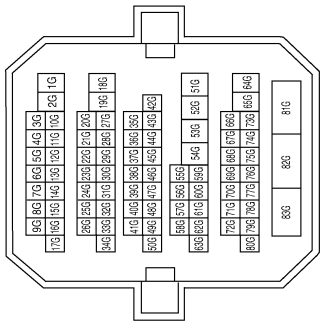


FRONT WIPER AND WASHER SYSTEM

FRONT WIPER AND WASHER SYSTEM CONNECTORS

Connector No.	M1
Connector Name	WIRE TO WIRE
Connector Color	WHITE

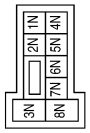
H.S.



Terminal No.	Color of Wire	Signal Name
8G	P	—
15G	L	—
17G	R/L	—
82G	W/B	—

Connector No.	M3
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
7N	Y/R	—

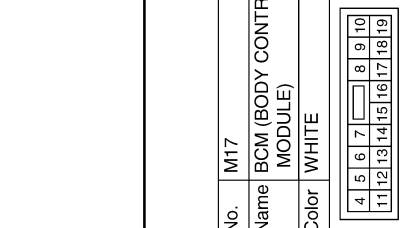
Connector No.	M16
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	W/B	BAT_POWER_F/L

Connector No.	M17
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	WHITE

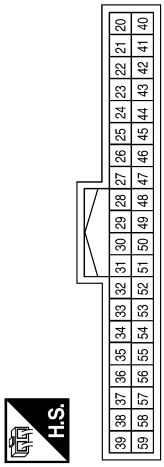
H.S.



Terminal No.	Color of Wire	Signal Name
11	Y/R	BAT_BCM_FUSE
13	B	GND1

Connector No.	M18
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	GREEN

H.S.



Terminal No.	Color of Wire	Signal Name
50	LG/B	INPUT_5
51	L/W	INPUT_1
52	G/B	INPUT_2
53	LG/R	INPUT_3
54	G/Y	INPUT_4

AWLIA0498GB

Connector No.	M19
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	BLACK

H.S.

79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64	63	62	61	60
99	98	97	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80

Terminal No.	Color of Wire	Signal Name
75	R/Y	OUTPUT_5
76	R/G	OUTPUT_3
78	P	CAN-L
79	L	CAN-H
95	R/W	OUTPUT_1
96	P/B	OUTPUT_4
97	R/B	OUTPUT_2

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	R/L	WASH_MTR
2	G/Y	OUTPUT_4
5	LG/R	OUTPUT_3
6	B	GND
7	R/G	INPUT_3
8	LG/B	OUTPUT_5
9	R/B	INPUT_2
10	P/B	INPUT_4
11	R/W	INPUT_1
12	L/W	OUTPUT_1
13	R/Y	INPUT_5
14	G/B	OUTPUT_2

Connector No.	E2
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1	2		3
4	5	6	7	8

Terminal No.	Color of Wire	Signal Name
2	R/L	—

Connector No.	E17
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE

H.S.

42	41	40	39
46	45	44	43

Terminal No.	Color of Wire	Signal Name
39	P	CAN-L
40	L	CAN-H
41	B	S-GND

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

H.S.

9	10	11	12	13	14
3	4	5	6	7	8

25	26	27	28	29		30	31	32	33	34
15	16	17	18	19		20	21	22	23	24

37	38
35	36

Terminal No.	Color of Wire	Signal Name
4	L/R	FR_WIPER_LO
5	L/B	FR_WIPER_HI
12	B	P-GND
16	L/Y	WIPER_AUTOSTOP

AWLIA0499GB

Connector No.	E21
Connector Name	JOINT CONNECTOR-E03
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	L	—
2	L	—

Connector No.	E22
Connector Name	JOINT CONNECTOR-E04
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	P	—
2	P	—

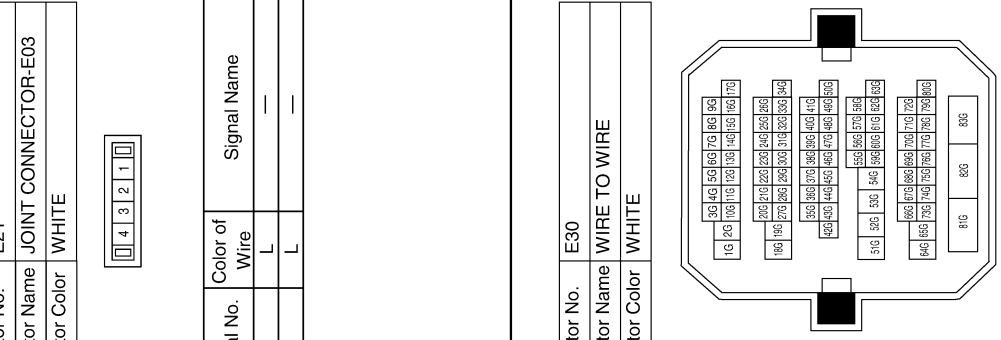
Connector No.	E25
Connector Name	FRONT WIPER MOTOR
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	L/R	—
2	B/Y	—
3	—	—
4	L/B	—
5	L/Y	—

Connector No.	E30
Connector Name	WIRE TO WIRE
Connector Color	WHITE

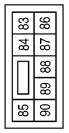
H.S.



Terminal No.	Color of Wire	Signal Name
8G	P	—
15G	L	—
17G	R/L	—
82G	W/B	—

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

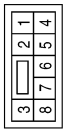
H.S.



Terminal No.	Color of Wire	Signal Name
88	R/W	WASHER_MTR

ALLIA0048GB

Connector No.	E202
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
2	R/L	—

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

Terminal No.	Color of Wire	Signal Name
1	R/W	—
2	R/L	—

ALLIA0049GB

ECU DIAGNOSIS

BCM (BODY CONTROL MODULE)

Reference Value

INFOID:0000000001723086

VALUES ON THE DIAGNOSIS TOOL

Monitor Item	Condition	Value/Status
FR WIPER HI	Other than front wiper switch HI	OFF
	Front wiper switch HI	ON
FR WIPER LO	Other than front wiper switch LO	OFF
	Front wiper switch LO	ON
FR WASHER SW	Front washer switch OFF	OFF
	Front washer switch ON	ON
FR WIPER INT	Other than front wiper switch INT	OFF
	Front wiper switch INT	ON
FR WIPER STOP	Front wiper is not in STOP position	OFF
	Front wiper is in STOP position	ON
INT VOLUME	Wiper intermittent dial is in a dial position 1 - 7	Wiper intermittent dial position

TERMINAL LAYOUT

Refer to BCS-45, "Terminal Layout".

PHYSICAL VALUES

Refer to BCS-45, "Physical Values".

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

Reference Value

INFOID:0000000001723087

VALUES ON THE DIAGNOSIS TOOL

Monitor Item	Condition		Value/Status
FR WIP REQ	Ignition switch ON	Front wiper switch OFF	STOP
		Front wiper switch INT	1LOW
		Front wiper switch LO	Low
		Front wiper switch HI	Hi
WIP AUTO STOP	Ignition switch ON	Front wiper stop position	STOP P
		Any position other than front wiper stop position	ACT P
WIP PROT	Ignition switch ON	Front wiper operates normally	Off
		Front wiper stops at fail-safe operation	BLOCK

TERMINAL LAYOUT

Refer to PCS-20.

PHYSICAL VALUES

Refer to PCS-20.

SYMPTOM DIAGNOSIS

FRONT WIPER AND WASHER SYSTEM SYMPTOMS

Symptom Table

INFOID:0000000001723088

CAUTION:

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

Symptom		Probable malfunction location	Inspection item
Front wiper does not operate	HI only	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-8, "System Description".
		• IPDM E/R • Harness between IPDM E/R and wiper motor • Front wiper motor	Front wiper motor (HI) circuit Refer to WW-17, "Component Function Check".
		Front wiper request signal • BCM • IPDM E/R	IPDM E/R Data monitor "FR WIP REQ"
	LO and INT	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-8, "System Description".
		• IPDM E/R • Harness between IPDM E/R and wiper motor • Front wiper motor	Front wiper motor (LO) circuit Refer to WW-15, "Component Function Check".
		Front wiper request signal • BCM • IPDM E/R	IPDM E/R Data monitor "FR WIP REQ"
	INT only	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-8, "System Description".
		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-36, "Diagnosis Procedure".	

Symptom		Probable malfunction location	Inspection item
Front wiper does not stop	HI only	• Combination switch • BCM	Combination switch Refer to BCS-8, "System Description".
		Front wiper request signal • BCM • IPDM E/R	IPDM E/R Data monitor "FR WIP REQ"
		IPDM E/R	—
	LO only	• Combination switch • BCM	Combination switch Refer to BCS-8, "System Description".
		Front wiper request signal • BCM • IPDM E/R	IPDM E/R Data monitor "FR WIP REQ"
		IPDM E/R	—
	INT only	• Combination switch • BCM	Combination switch refer to BCS-8, "System Description".
		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 • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-8, "System Diagram".
		BCM	—
	Intermittent control linked with vehicle speed cannot be performed	Check the vehicle speed detection wiper setting. Refer to WW-11, "WIPER : CONSULT - III Function (BCM - WIPER)".	
	Wiper is not linked to the washer operation	• Combination switch • Harness between combination switch and BCM • BCM	Combination switch Refer to BCS-8, "System Diagram".
		BCM	—
	Does not return to stop position (Repeatedly operates for 10 seconds and then stops for 20 seconds. After that, it stops the operation.	• IPDM E/R • Harness between IPDM E/R and front wiper motor • Front wiper motor	Front wiper auto stop signal circuit Refer to WW-19, "Component Function Check".

FRONT WIPER DOES NOT OPERATE

Description

INFOID:0000000001723089

The front wiper does not operate under any operation conditions

Diagnosis Procedure

INFOID:0000000001723090

1. CHECK WIPER RELAY OPERATION

IPDM E/R AUTO ACTIVE TEST
1. Start IPDM E/R auto active test. Refer to PCS-10, "Diagnosis Description".
2. Check that the front wiper operates at the LO/HI operation.

CONSULT-III ACTIVE TEST
1. Select "FRONT WIPER" of IPDM E/R active test item.
2. While operating the test item, check that front wiper LO/HI operation and OFF.

LO : Front wiper LO operation
HI : Front wiper HI operation
OFF : Stop the front wiper.

Does the front wiper operate?

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

2. CHECK FRONT WIPER MOTOR FUSE

1. Turn the ignition switch OFF.
2. Check that the front wiper motor fuse 30A (No. 55, located in the IPDM E/R) is not blown.

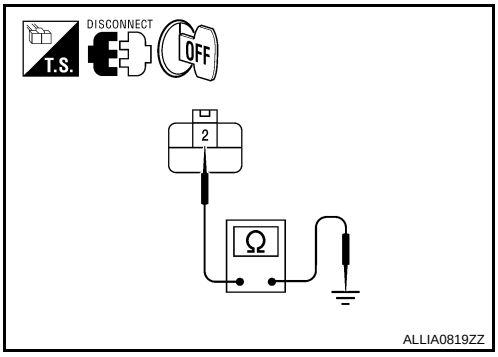
Is the fuse blown?

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

3. CHECK FRONT WIPER MOTOR (GND) OPEN 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		
E25	2		Yes



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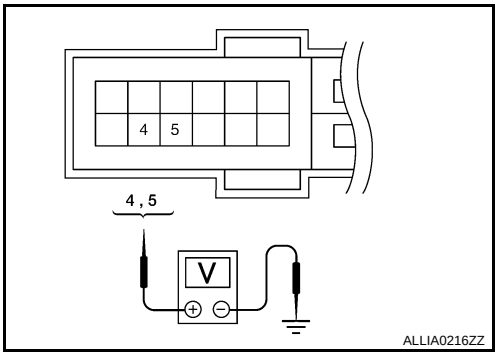
Does continuity exist?

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

4. CHECK FRONT WIPER MOTOR OUTPUT VOLTAGE

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



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Terminals			Test item	Voltage (V) (Approx.)
(+)		(-)		
IPDM E/R		Ground	FRONT WIPER	
Connector	Terminal			
E18	4		LO	Battery voltage
			OFF	0 V
	5		HI	Battery voltage
			OFF	0 V

Is the measurement normal?

YES >> Replace front wiper motor. Refer to WW-41, "FRONT WIPER DRIVE ASSEMBLY : Removal and Installation".

NO >> Replace IPDM E/R. Refer to PCS-43, "Removal and Installation".

5. CHECK FRONT WIPER REQUEST SIGNAL INPUT

CONSULT-III DATA MONITOR

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

Monitor item	With operating the front wiper switch condition		Monitor status
FR WIPER REQ	Front wiper switch HI	ON	HI
		OFF	STOP
	Front wiper switch LO	ON	LOW
		OFF	STOP

Is the status of item normal?

YES >> Replace IPDM E/R. Refer to PCS-43, "Removal and Installation".

NO >> GO TO 6

6. CHECK COMBINATION SWITCH

1. Perform the inspection of the combination switch. Refer to BCS-8, "System Description".

Is combination switch normal?

YES >> Replace BCM. Refer to BCS-88, "Removal and Installation".

NO >> Repair or replace the malfunctioning parts.

NORMAL OPERATING CONDITION

Description

INFOID:0000000001723091

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.

PRECAUTION

PRECAUTIONS

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

INFOID:0000000001342233

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.**

General Precautions for Service Operations

INFOID:0000000001342234

Wiring Diagrams and Trouble Diagnosis

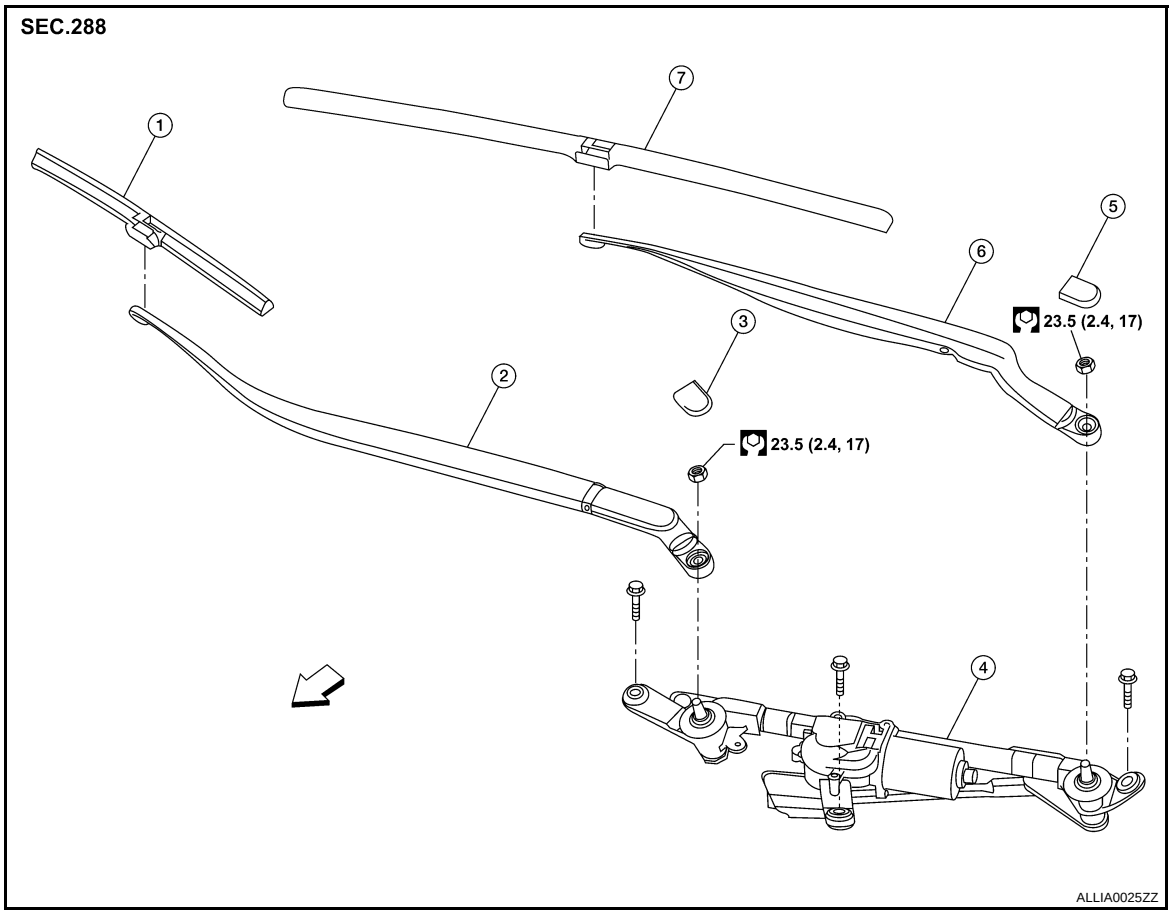
INFOID:0000000001342235

ON-VEHICLE REPAIR

FRONT WIPER

Exploded View

INFOID:0000000001342236



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

⇐ Front

FRONT WIPER ARMS

FRONT WIPER ARMS : Removal and Installation

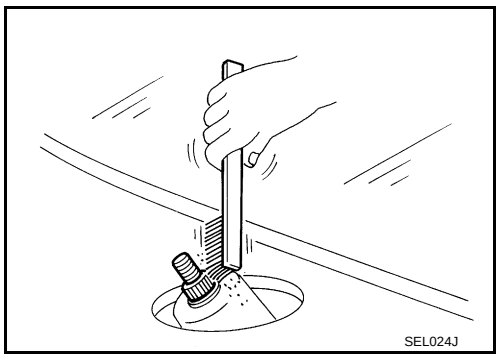
INFOID:0000000001342237

REMOVAL

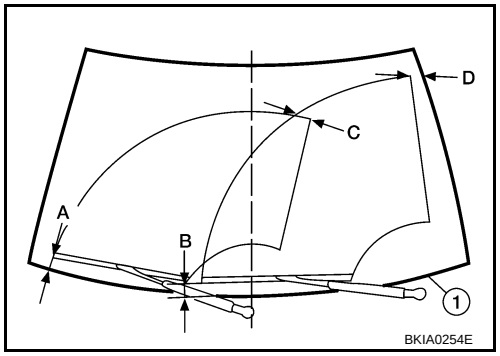
1. Turn wiper switch ON to operate wiper motor, and then turn wiper switch OFF (auto stop).
2. Open hood, remove arm caps, and remove wiper arm nuts.
3. Raise wiper arm, and remove wiper arm from the vehicle.

INSTALLATION

1. Clean up the pivot area as shown in the figure. This will reduce possibility of wiper arm looseness.



2. Prior to wiper arm installation, turn on wiper switch to operate wiper motor and then turn it “OFF” (auto stop).
3. Push wiper arm onto pivot shaft, paying attention to blind spline.
4. Lift the blade up and then set it down onto glass surface to set the blade center to clearance "A", "B", "C" and "D" immediately before temporarily tightening the wiper arm nuts.
5. Spray washer fluid. Turn on wiper switch to operate wiper motor and then turn it “OFF”.
6. Make sure that wiper blades stop within clearance "A", "B", "C" and "D".



Clearance “A” : 41.3 ± 7.5 mm (1.626 ± 0.295 in)
Clearance “B” : 65.5 ± 7.5 mm (2.579 ± 0.295 in)
Clearance “C” : 27.8 mm (1.094 in)
Clearance “D” : 53.7 mm (2.114 in)

7. Tighten wiper arm nuts to specification. Refer to WW-40, "Exploded View".
8. Attach wiper arm caps.

ADJUSTMENT

To adjust the wiper arm stop location, the wiper arm must be removed and installed. Refer to WW-40, "FRONT WIPER ARMS : Removal and Installation".

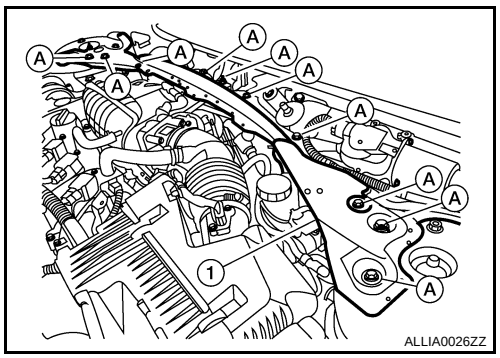
FRONT WIPER DRIVE ASSEMBLY

FRONT WIPER DRIVE ASSEMBLY : Removal and Installation

INFOID:0000000001342238

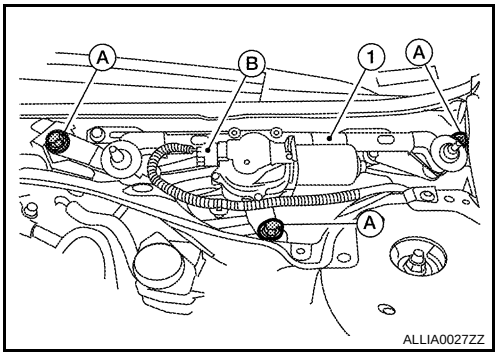
REMOVAL

1. Operate front wiper motor, and stop at the auto stop position.
2. Remove wiper arms. Refer to WW-40, "FRONT WIPER ARMS : Removal and Installation".
3. Remove the cowl top cover. Refer to EXT-18, "Removal and Installation".
4. Remove the strut brace bolts (A), detach the wiper drive assembly harness clips, then remove the strut brace (1).



5. Detach the wiper drive harness clip from the wiper drive assembly frame.

6. Remove the front wiper drive assembly bolts (A), disconnect the wiper drive motor connector (B) and remove the front wiper drive assembly (1).



INSTALLATION

1. Install the front wiper drive assembly.
2. Connect wiper motor connector. Turn wiper switch ON to operate wiper motor, then turn wiper switch OFF (auto stop).
3. Attach the wiper drive harness clip to the wiper drive assembly frame.
4. Install the strut brace, then attach the wiper drive assembly harness clips.
5. Install the cowl top cover. Refer toEXT-18, "Removal and Installation".
6. Attach the wiper arms. Refer to WW-40, "FRONT WIPER ARMS : Removal and Installation".
7. Adjustment of wiper arm stop location. Refer to WW-40, "FRONT WIPER ARMS : Removal and Installation".

FRONT WASHER

WASHER TUBE

WASHER TUBE : Layout

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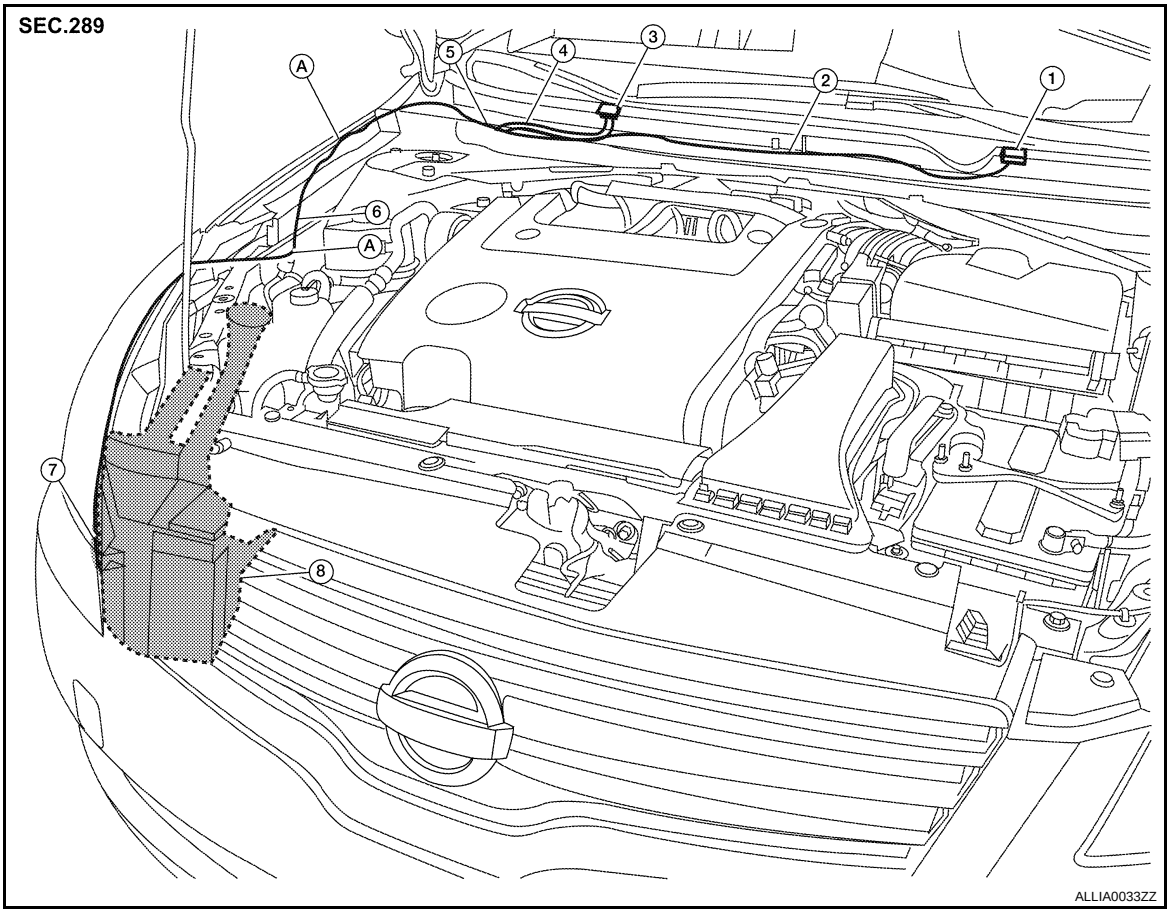


1. Washer nozzle LH
2. Washer nozzle hose LH
3. Washer nozzle RH
4. Washer nozzle hose RH
5. Y-tube connector
6. Clip
7. Washer tank hose
8. Washer tank
A. Tube connectors

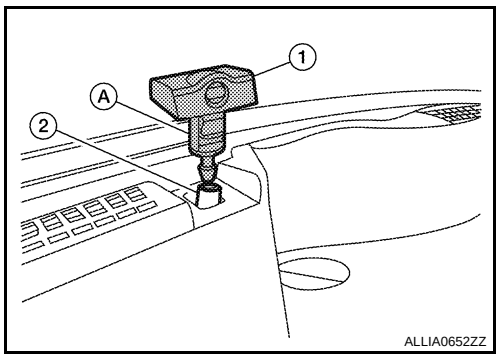
FRONT WASHER NOZZLE

FRONT WASHER NOZZLE : Removal and Installation

INFOID:0000000001342240

REMOVAL

1. Remove the cowl top cover Refer to EXT-18, "Removal and Installation".
2. Push washer nozzle tab (A), to release the washer nozzle (1) from the cowl top cover, then disconnect the washer nozzle hose (2).



INSTALLATION

1. Installation is in the reverse order of removal.
2. Adjust nozzle spray location. Refer to WW-44, "FRONT WASHER NOZZLE : Adjustment".

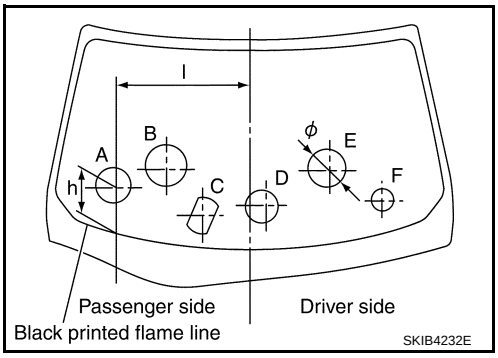
FRONT WASHER NOZZLE : Adjustment

INFOID:0000000001342241

Adjust spray positions to match the positions as shown.

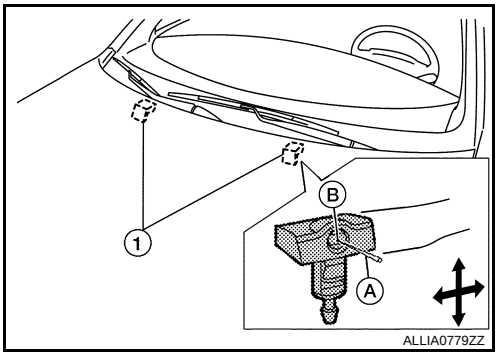
Unit: mm (in)

Spray position	h (height)	l (width)	Height*1 (spray point area)
A	193.1 (7.53)	487.5 (7.53)	233 (9.17)
B	277.0 (10.91)	318.1 (19.59)	368 (14.49)
C	333.6 (13.13)	115.5 (4.55)	256 (10.08)
D	230.0 (9.06)	81.0 (3.19)	350 (13.78)
E	283.9 (11.18)	280.7 (11.05)	319 (12.56)
F	330.4 (13.01)	483.0 (19.03)	282 (11.10)



*1: Spray positions are aiming targets, heights are allowable spray patterns above the target points.

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



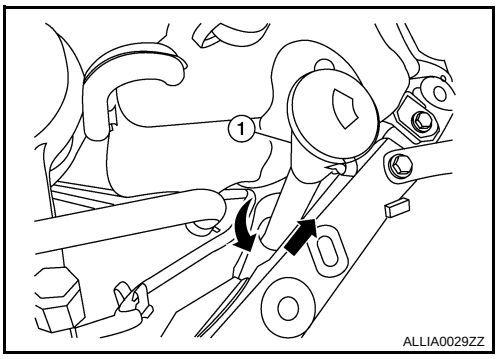
WASHER TANK

WASHER TANK : Removal and Installation

INFOID:0000000001342242

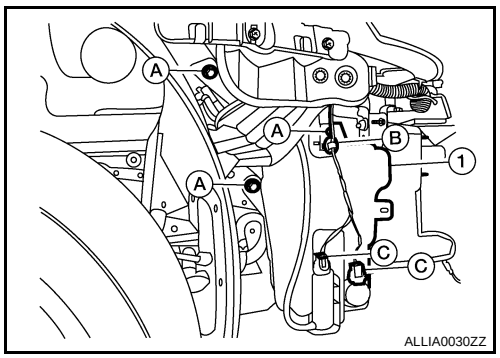
REMOVAL

1. Remove the washer tank filler tube (1).



2. Remove engine under cover.
3. Position the RH fender protector back. Refer to EXT-19, "Removal and Installation".

4. Disconnect the washer pump and washer fluid level sensor connectors (C), then detach the connector harness clip (B).
5. Remove the washer tank nuts (A), disconnect the washer pump hose and remove the washer tank (1).



INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

After installation, add Nissan specified fluid up to the upper level of washer tank inlet, and check for leaks. Refer to MA-12, "Fluids and Lubricants".

FRONT WASHER PUMP

FRONT WASHER PUMP : Removal and Installation

INFOID:0000000001342243

Front washer pump is not available seperately, it is part of the washer tank. Refer to WW-44, "WASHER TANK : Removal and Installation".

FRONT WIPER AND WASHER SWITCH

Removal and Installation

INFOID:0000000001342244

NOTE:
The wiper washer switch is part of the combination switch assembly.

REMOVAL

1. Remove the spiral cable. Refer to SR-6, "Removal and Installation".
2. Disconnect the combination switch connector and remove the combination switch assembly.

INSTALLATION

Installation is in the reverse order of removal.