SECTION PCS
POWER CONTROL SYSTEM

CONTENTS

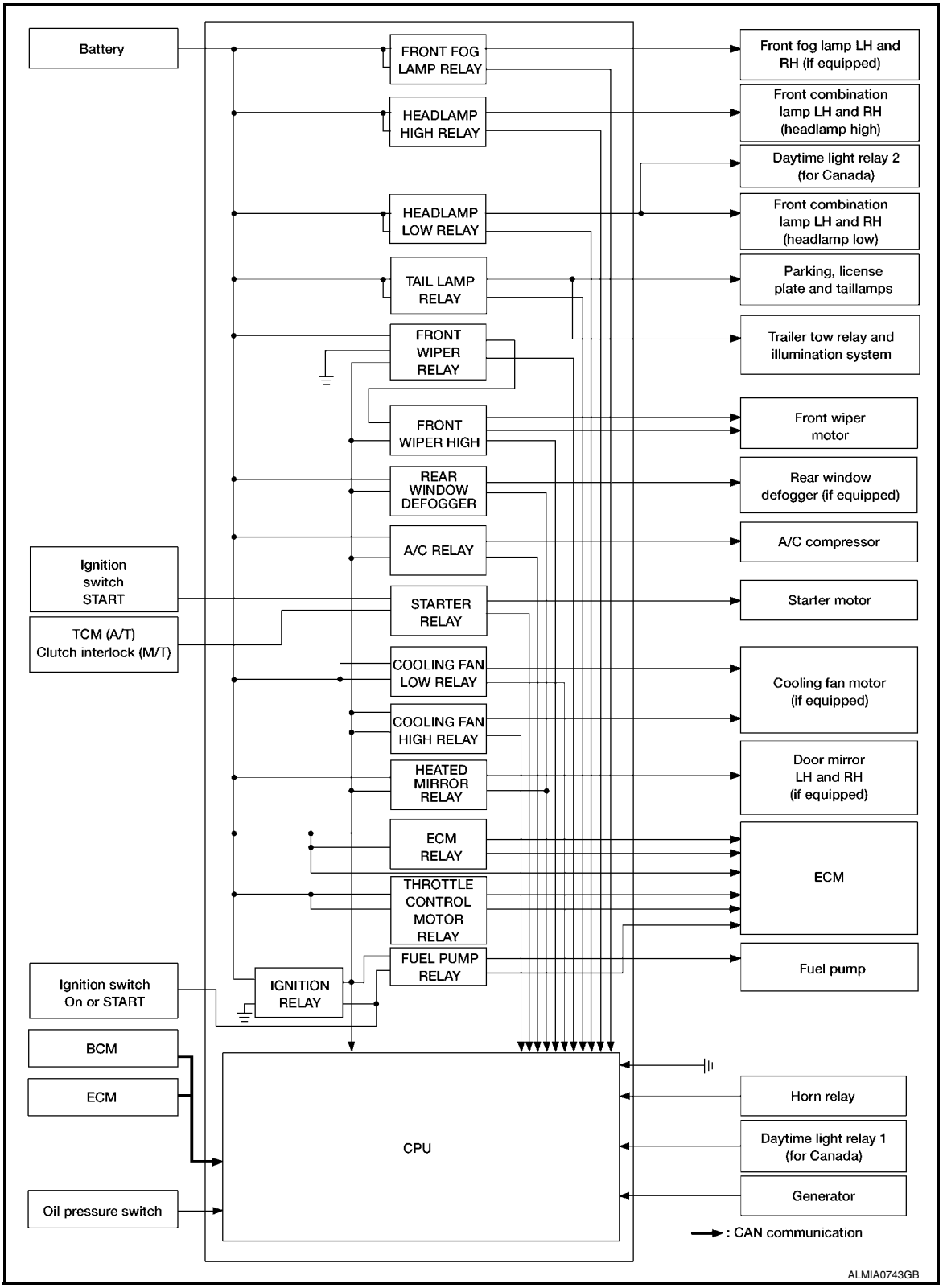
IPDM E/R

SYSTEM DESCRIPTION

RELAY CONTROL SYSTEM

System Diagram

INFOID:0000000012563511



System Description

INFOID:0000000012563512

IPDM E/R activates the internal control circuit to perform the relay ON-OFF control according to the input signals from various sensors and the request signals received from control units via CAN communication.

CAUTION:

IPDM E/R integrated relays cannot be removed.

Control relay	Input/output	Transmit unit	Control part	Reference page
Front fog lamp relay (if equipped)	Front fog lamp request signal	BCM (CAN)	Front fog lamps (if equipped)	EXL-48
• Headlamp high relay • Headlamp low relay	• High beam request signal • Low beam request signal	BCM (CAN)	• Headlamp high • Headlamp low	EXL-10 EXL-42
Tail lamp relay	Position light request signal	BCM (CAN)	• Parking lamps • License plate lamps • Tail lamps • Trailer tow relay • Illumination system	EXL-50
• Front wiper relay • Front wiper high relay	Front wiper request signal	BCM (CAN)	Front wiper motor	WW-48
Rear window defogger relay (if equipped)	Rear window defogger request signal	BCM (CAN)	Rear window defogger (if equipped)	DEF-4
A/C relay	A/C request signal	• BCM (CAN) • ECM (CAN)	A/C compressor	HAC-121
Starter relay	Ignition switch START signal	• TCM (A/T) • Clutch interlock (M/T)	Starter motor	STR-11 (A/T) STR-12 (M/T with clutch interlock cancel system) STR-14 (M/T without clutch interlock cancel system)
Cooling fan relays (if equipped)	Cooling fan request signal	ECM (CAN)	Cooling fan relay (if equipped)	EC-506 (For USA and Canada) EC-1009 (For Mexico)
Heated mirror relay (if equipped)	Heated mirror request signal	BCM (CAN)	Door mirrors (if equipped)	DEF-4
ECM relay	ECM relay control signal	ECM (CAN)	ECM relay	EC-26 (QR25DE) EC-489 (VQ40DE for USA and Canada) EC-993 (VQ40DE for Mexico
Throttle control motor relay	Throttle control motor control signal	ECM (CAN)	Throttle control motor relay	EC-33 (QR25DE) EC-498 (VQ40DE for USA and Canada) EC-1001 (VQ40DE for Mexico)

Control relay	Input/output	Transmit unit	Control part	Reference page
Fuel pump relay	Fuel pump request signal	ECM (CAN)	Fuel pump	EC-452 (QR25DE) EC-954 (VQ40DE for USA and Canada) EC-1374 (VQ40DE for Mexico)
Ignition relay	Ignition switch ON signal	Ignition switch	Ignition relay	EC-456 (QR25DE) EC-957 (VQ40DE for USA and Canada) EC-1378 (VQ40DE for Mexico)

Component Parts Location

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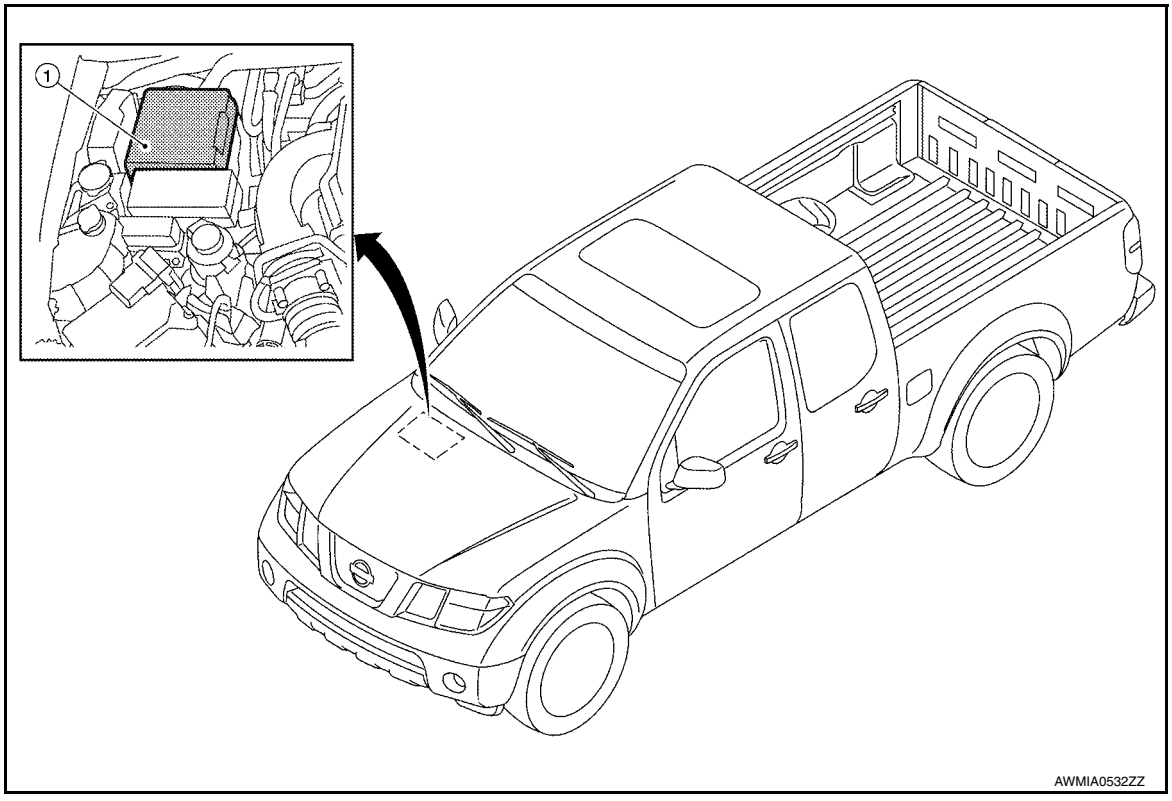
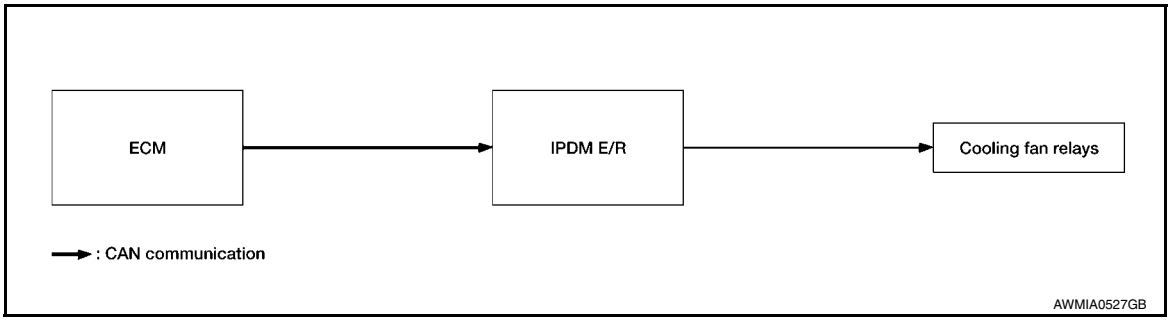


1. IPDM E/R E118, E119, E120, E121, E122, E123, E124

POWER CONTROL SYSTEM

System Diagram

INFOID:0000000012563514



System Description

INFOID:0000000012563515

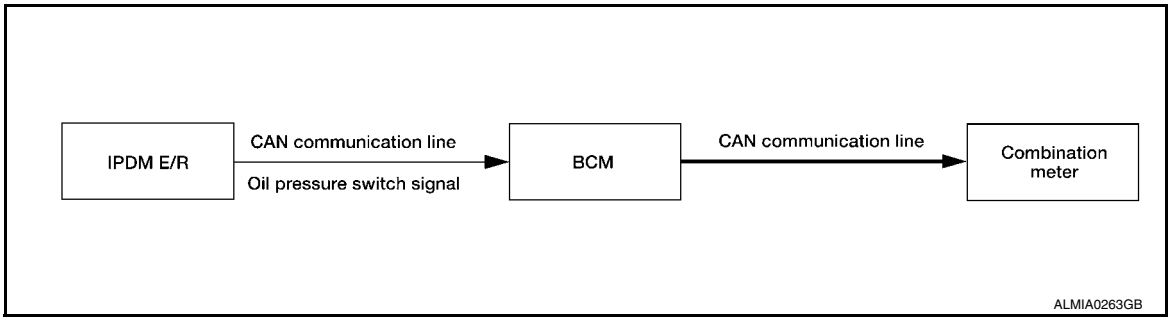
COOLING FAN CONTROL

IPDM E/R controls the cooling fan according to the status of the cooling fan speed request signal received from ECM via CAN communication. Refer to LAN-4, "System Description".

SIGNAL BUFFER SYSTEM

System Diagram

INFOID:0000000012797943



System Description

INFOID:0000000012797944

OUTLINE

BCM has the signal transmission function that outputs/transmits each input/received signal to each unit.

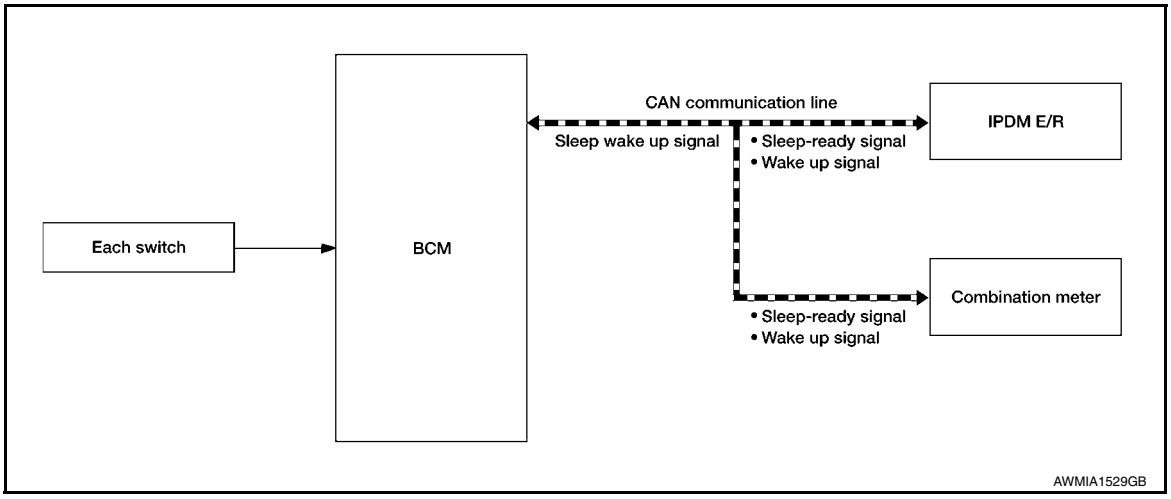
Signal transmission function list

Signal name	Input	Output	Description
Oil pressure switch signal	IPDM E/R (CAN)	Combination meter (CAN)	Transmits the received oil pressure switch signal via CAN communication.

POWER CONSUMPTION CONTROL SYSTEM

System Diagram

INFOID:0000000012797945



System Description

INFOID:0000000012797946

OUTLINE

- BCM incorporates a power consumption control function that reduces the power consumption according to the vehicle status.
- BCM switches the status (control mode) by itself with the power saving control function. It performs the sleep request to each unit (IPDM E/R and combination meter) that operates with the ignition switch OFF.

Normal mode (wake-up)
- CAN communication is normally performed with other units
- Each control with BCM is operating properly

CAN communication sleep mode (CAN sleep)
- CAN transmission is stopped
- Control with BCM only is operating

Low power consumption mode (BCM sleep)
- Low power consumption control is active
- CAN transmission is stopped

LOW POWER CONSUMPTION CONTROL WITH BCM

BCM reduces the power consumption with the following operation in the low power consumption mode.
- The reading interval of the each switches changes from 10 ms interval to 20 ms interval.

Sleep mode activation

- BCM receives the sleep-ready signal (ready) from IPDM E/R and combination meter via CAN communication.
- BCM transmits the sleep wake up signal (sleep) to each unit when all of the CAN sleep conditions are fulfilled.
- Each unit stops the transmission of CAN communication with the sleep wake up signal. BCM is in CAN communication sleep mode.
- BCM is in the low power consumption mode and perform the low power consumption control when all of the BCM sleep conditions are fulfilled with CAN sleep condition.

Sleep condition

CAN sleep condition	BCM sleep condition
• Receiving the sleep-ready signal (ready) from all units • Ignition switch: OFF • Vehicle security system alarm: No operation • Warning lamp: No operation • Warning chime: No operation • Stop lamp switch: OFF • Key switch status: No change for 2 seconds • Hazard warning lamp: No operation • Exterior lamp: OFF • Door lock status: No change for 2 seconds • CONSULT communication status: No communication • Door switch status: No change for 2 seconds	The controls only BCM are completed. (Interior room lamp battery saver: Time out etc.)

Wake-up operation

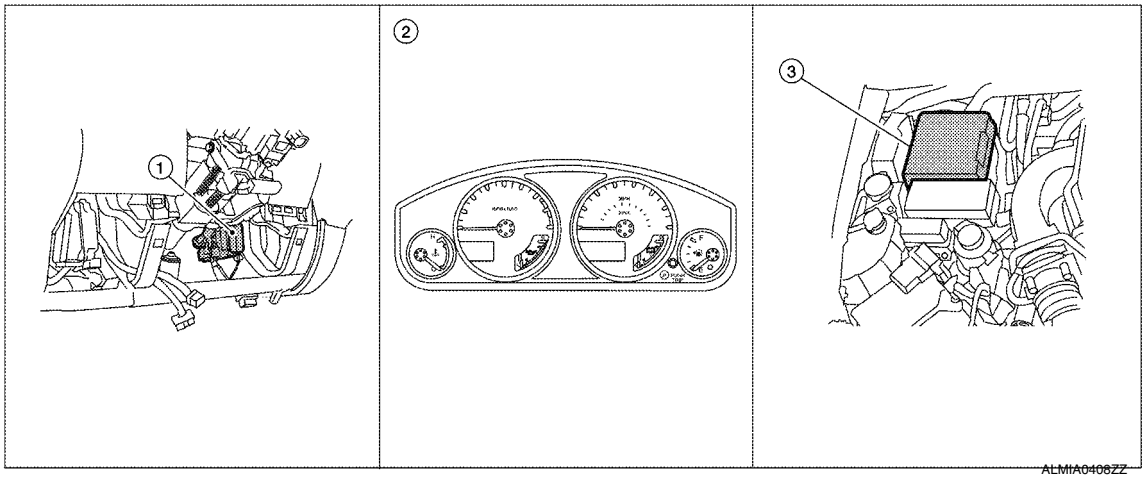
- BCM transmits sleep wake up signal (wake up) to each unit when any condition listed below is established, and then goes into normal mode from low power consumption mode.
- Each unit starts transmissions with CAN communication by receiving sleep wake up signals. Each unit transmits wake up signals to BCM with CAN communication to convey the start of CAN communication.

Wake-up condition

BCM wake-up condition
• Ignition switch: OFF → ACC or ON • Stop lamp switch: ON (Depress brake pedal) • Any door switch: OFF → ON • Lighting switch: OFF → 1ST or PASS • Hazard switch: OFF → ON • Remote keyless entry receiver: Receiving (with remote keyless entry)

Component Parts Location

INFOID:0000000012797947



1. BCM M18, M19, M20 (view with lower instrument panel LH removed)
2. Combination meter M24
3. IPDM E/R

DIAGNOSIS SYSTEM (IPDM E/R)

Diagnosis Description

INFOID:0000000012563521

AUTO ACTIVE TEST

Description

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

- Oil pressure low warning indicator
- Oil pressure gauge (if equipped)
- Rear window defogger (if equipped)
- Front wipers
- Tail, license and parking lamps
- Front fog lamps (if equipped)
- Headlamps (Hi, Lo)
- A/C compressor (magnetic clutch)
- Cooling fan (if equipped)

Operation Procedure

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

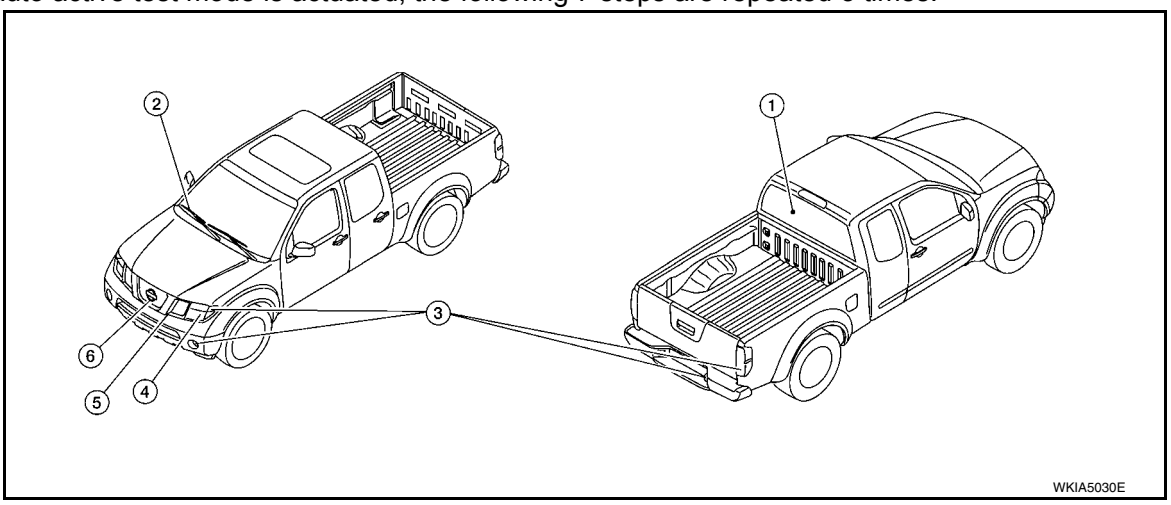
NOTE:
When auto active test mode has to be cancelled halfway through test, turn ignition switch OFF.

CAUTION:

- **If auto active test mode cannot be actuated, check door switch system. Refer to DLK-27, "KING CAB : Description" (king cab) or DLK-29, "CREW CAB : Description" (crew cab).**
- **Do not start the engine.**

Inspection in Auto Active Test Mode

When auto active test mode is actuated, the following 7 steps are repeated 3 times.



Item Number	Test Item	Operation Time/Frequency
1	Rear window defogger (if equipped)	10 seconds
2	Front wipers	LOW 5 seconds then HIGH 5 seconds
3	Tail, license plate, front fog and parking lamps	10 seconds