SECTION PB
PARKING BRAKE SYSTEM

CONTENTS

PRECAUTION

PRECAUTIONS

Precaution for Technicians Using Medical Electric

INFOID:0000000007071893

OPERATION PROHIBITION

WARNING:

- **Parts with strong magnet is used in this vehicle.**
- **Technicians using a medical electric device such as pacemaker must never perform operation on the vehicle, as magnetic field can affect the device function by approaching to such parts.**

NORMAL CHARGE PRECAUTION

WARNING:

- **If a technician uses a medical electric device such as an implantable cardiac pacemaker or an implantable cardioverter defibrillator, the possible effects on the devices must be checked with the device manufacturer before starting the charge operation.**
- **As radiated electromagnetic wave generated by on board charger at normal charge operation may effect medical electric devices, a technician using a medical electric device such as implantable cardiac pacemaker or an implantable cardioverter defibrillator must not enter the vehicle compartment (including luggage room) during normal charge operation.**

Precaution at telematics system operation

WARNING:

- **If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna.**
- **The electromagnetic wave of TCU might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), when using the service, etc.**
- **If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator(ICD), the electromagnetic wave of TCU might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before TCU use.**

Precaution at intelligent key system operation

WARNING:

- **If a technician uses implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), avoid the device implanted part from approaching within approximately 220 mm (8.66 in) from interior/exterior antenna.**
- **The electromagnetic wave of intelligent key might affect the function of the implantable cardiac pacemaker or the implantable cardioverter defibrillator (ICD), at door operation, at each request switch operation, or at engine starting.**
- **If a technician uses other medical electric devices than implantable cardiac pacemaker or implantable cardioverter defibrillator (ICD), the electromagnetic wave of intelligent key might affect the function of the device. The possible effects on the devices must be checked with the device manufacturer before intelligent key use.**

Point to Be Checked Before Starting Maintenance Work

INFOID:0000000007079423

The high voltage system may starts automatically. It is required to check that the timer air conditioner and timer charge (during EVSE connection) are not set before starting maintenance work.
NOTE:
If the timer air conditioner or timer charge (during EVSE connection) is set, the high voltage system starts automatically even when the power switch is in OFF state.

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

INFOID:0000000007080035

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 “SRS AIR BAG” and “SEAT BELT” of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see “SRS AIR BAG”.**
- **Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

Always observe the following items for preventing accidental activation.

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the power switch ON, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the power switch OFF, disconnect the 12V battery, and wait at least 3 minutes before performing any service.**

Precaution for Removing 12V Battery

INFOID:0000000007071894

When removing the 12V battery, turn ON/OFF the power switch and check that the charging status indicator does not blink. The 12V battery must be removed within one hour after checking the indicator lamp.

NOTE:

- The automatic 12V battery charge control may start even when the power switch is in OFF state.
- The automatic 12V battery charge control does not start within approximately one hour when the power switch is turned ON/OFF.

Precaution for Parking Brake System

INFOID:0000000006960874

WARNING:

Since dust covering the parking brake shoe has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.

- The electric parking brake indicator lamp turns ON while the electric parking brake is operating.
- When a malfunction occurs in the electric parking brake system, master warning (yellow) turns ON.

CAUTION:

When vehicle is parked, press the select lever P range position switch into the P range.

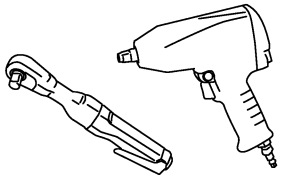
- When parking brake switch is pulled/pushed under electric parking brake system malfunction, master warning (red) turns ON when electric parking brake cannot be operated.
- When a malfunction occurs that prevents the parking brake from being released and the parking brake must be released, manually release it. PB-9, "Parking Brake Actuator".
- When parking brake must be released while the 12V battery negative terminal is disconnected, manually release it. PB-9, "Parking Brake Actuator".
- When parking brake shoe is ground or replaced, perform break-in operation. Refer to PB-86, "Inspection".

PREPARATION

PREPARATION

Commercial Service Tools

INFOID:0000000006961533

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts.

SYSTEM DESCRIPTION

DESCRIPTION

Description

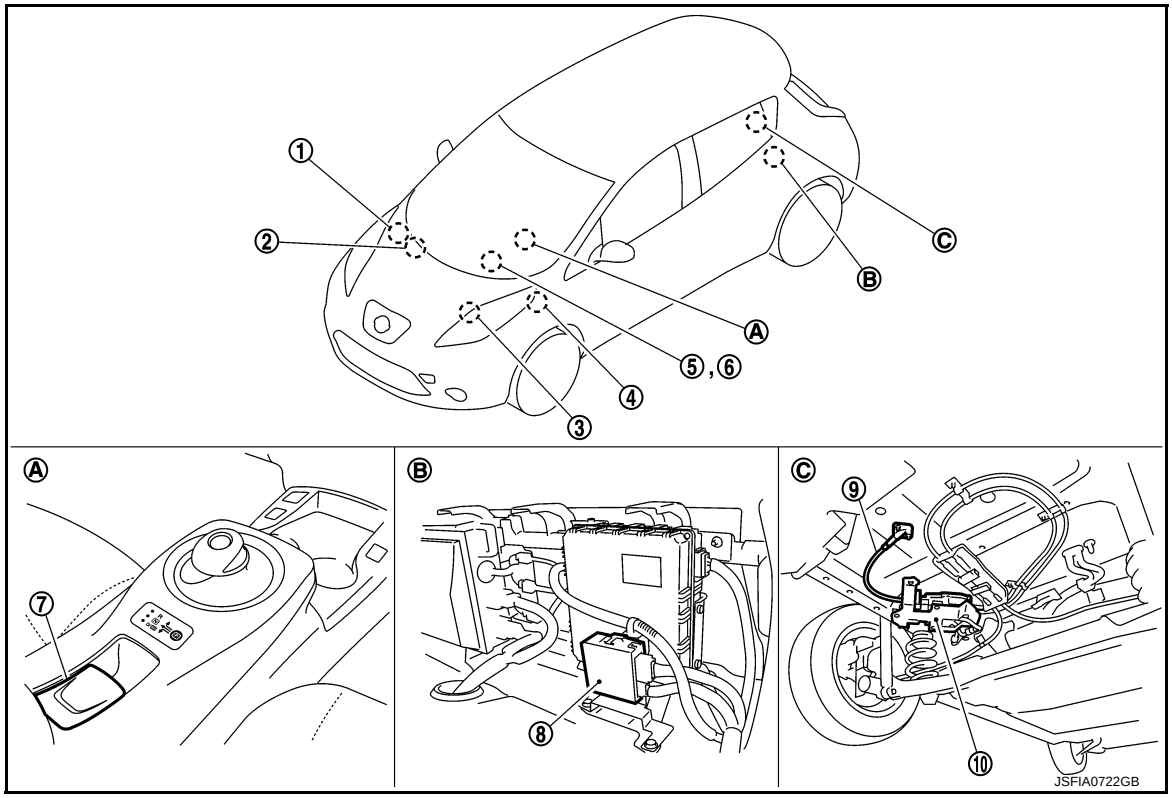
INFOID:0000000006960875

- The electric parking brake system is adopted.
- The electric parking brake system uses the signal from the parking brake switch to have the electric parking brake control module operate the parking brake actuator to apply and release the parking brake.
- The parking brake switch is placed in the center console so that it can be operated close at hand (applied/released).
- An emergency release cable is employed so that the parking brake can be manually released when electric parking brake malfunctions. In addition, the vehicle is equipped with a tool for releasing the parking brake.

COMPONENT PARTS

Component Parts Location

INFOID:0000000006960876



A. Center console B. Back of rear seat (left) C. Rear under floor

COMPONENT DESCRIPTION

No.	Component part	Function
1.	ABS actuator and electric unit (control unit)	Mainly transmits the following signals to electric parking brake control module via CAN communication. • Decel G signal • Rear LH Wheel speed signal • Rear RH Wheel speed signal • Vehicle speed signal (ABS)
2.	VCM	Mainly transmits the following signals to electric parking brake control module via CAN communication. • Sift position signal • Accelerator pedal position signal • VCM status signal
3.	IPDM E/R	Mainly transmits the following signals to electric parking brake control module via CAN communication. • Power switch signal
4.	BCM	Mainly transmits the following signals to electric parking brake control module via CAN communication. • Stop lamp switch signal
5.	Electric parking brake indication lamp (in combination meter) Master warning (yellow) Master warning (red)	PB-14, "System Description"

No.	Component part	Function
6.	Combination meter	Mainly transmits the following signals to electric parking brake control module via CAN communication. • Seat belt buckle switch signal (driver side) Mainly receives the following signals from electric parking brake control module via CAN communication. • Master warning signal • Electric parking brake indication lamp signal
7.	Parking brake switch	PB-9, "Parking Brake Switch"
8.	Electric parking brake control module	PB-9, "Electric Parking Brake Control Module"
9.	Emergency release cable	PB-9, "Parking Brake Actuator"
10.	Parking brake actuator	

Electric Parking Brake Control Module

INFOID:0000000006960877

- The parking brake actuator is controlled by the signals from the parking brake switch, sensors, and units.
  NOTE:
  The parking brake is released and applied by controlling the parking brake actuator.
- When a malfunction is detected, the system enters fail-safe mode.

Parking Brake Switch

INFOID:0000000006960878

- Pulling the parking brake switch applies the parking brake.
- Pressing the parking brake switch releases the parking brake.
- When the parking brake is applied, the parking brake switch indicator turns ON. In addition, it turns OFF when the parking brake is released.

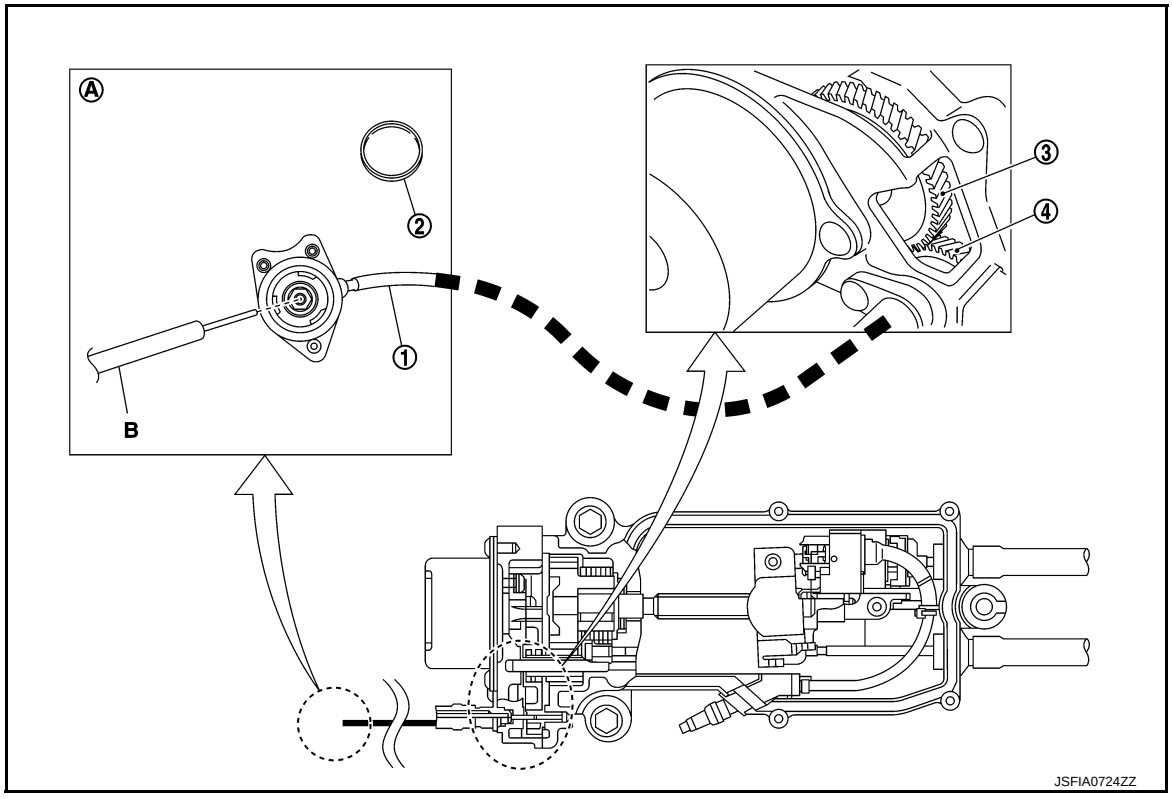
Parking Brake Actuator

INFOID:0000000006960879

- The signal from the electric parking brake control module applies and releases the parking brake.
- The following components are integrated with parking brake actuator.

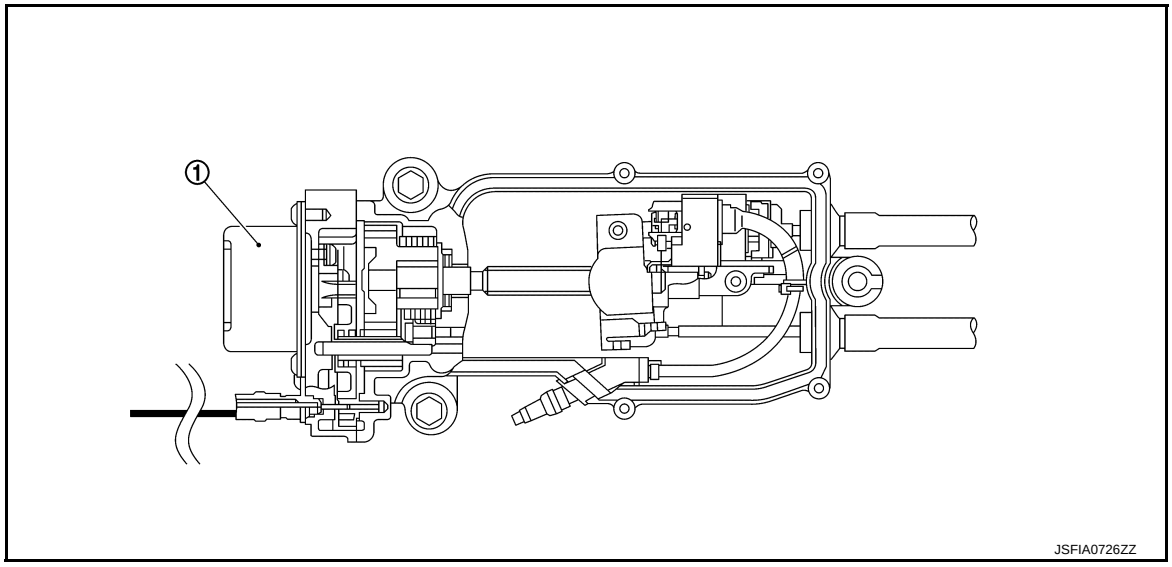
Emergency release cable

- When there is a malfunction that prevents the parking brake from being released, use the tool in the luggage room to manually turn and release the parking brake.
- When the emergency release cable is rotated counterclockwise while pressing it to parallel direction to axis with the cap removed, deceleration gear is rotated through release gear, which results in electric parking brake release.
  CAUTION:
  After manual release, perform “EHS/PKB” self diagnosis. When a malfunction is detected, erase self diagnosis result for “EHS/PKB”.



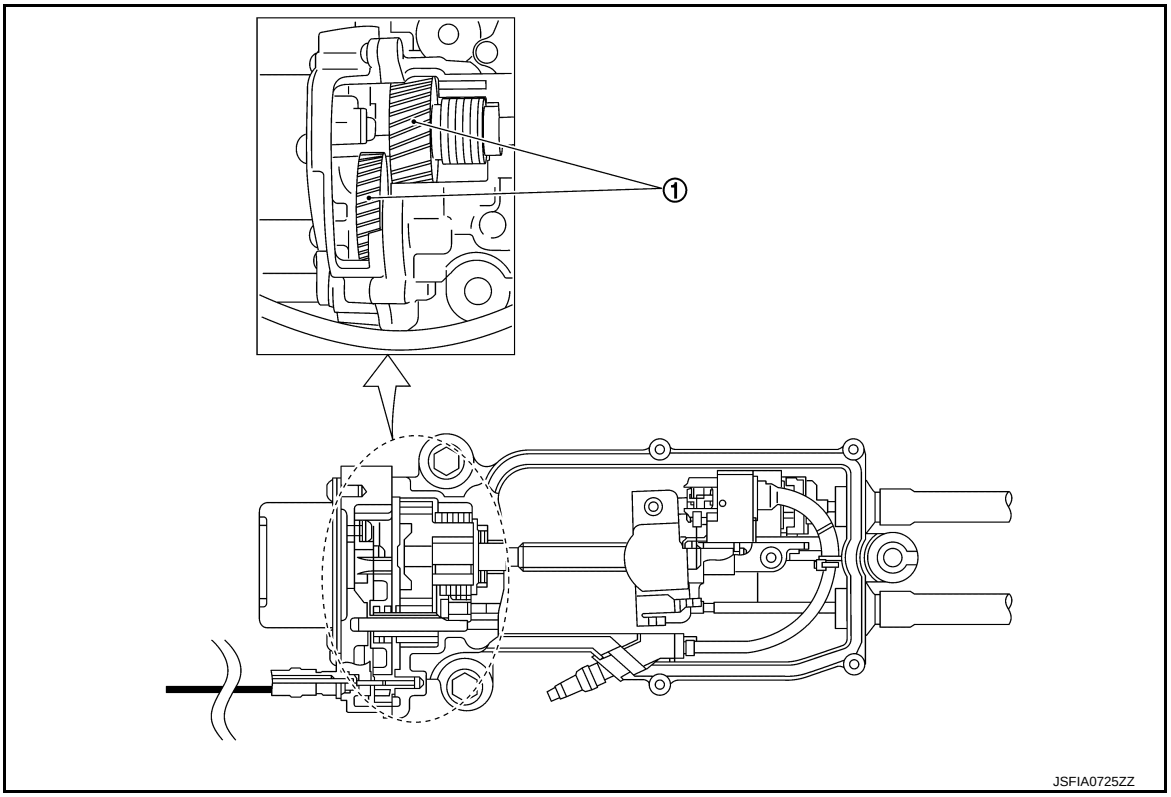
1. Emergency release cable
2. Cap
3. Reduction gear
4. Release gear
A. Luggage room
B. Hand tool

Motor
- Generates rotation starting torque using electric parking brake control module.



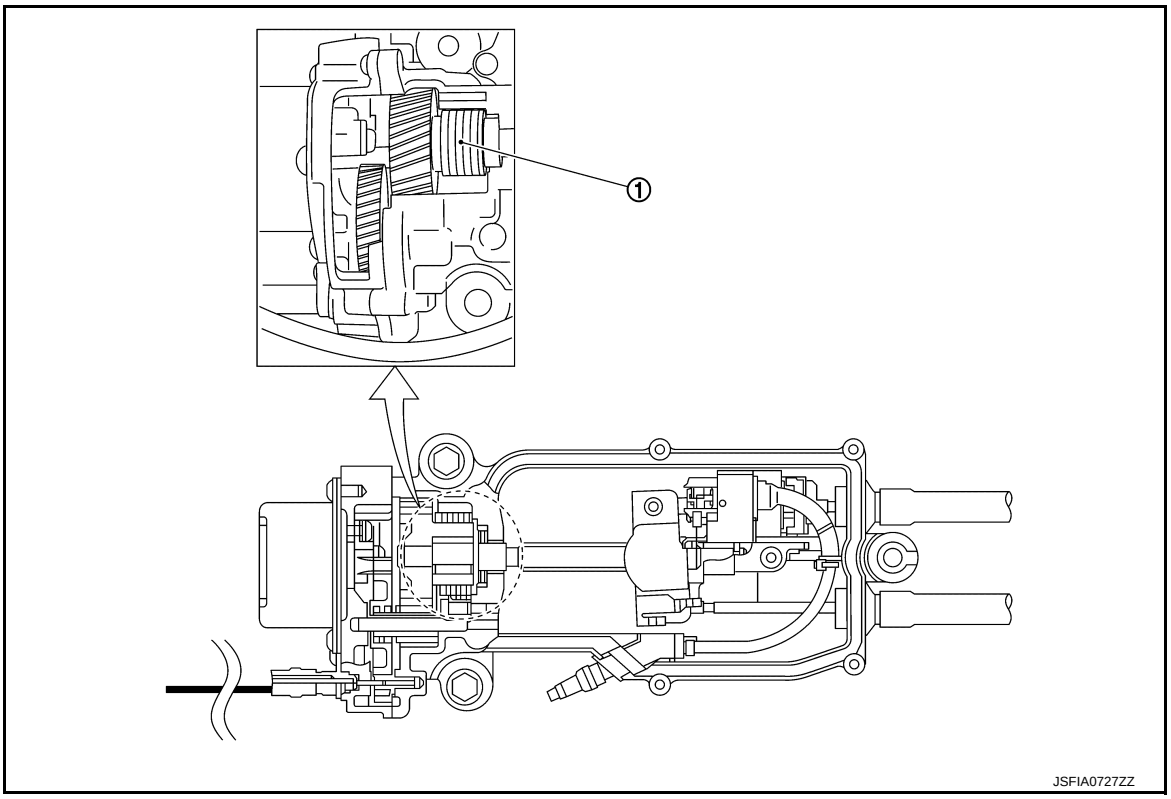
1. Motor

Reduction gear
- Decreases rotation speed and increases motor rotating torque.



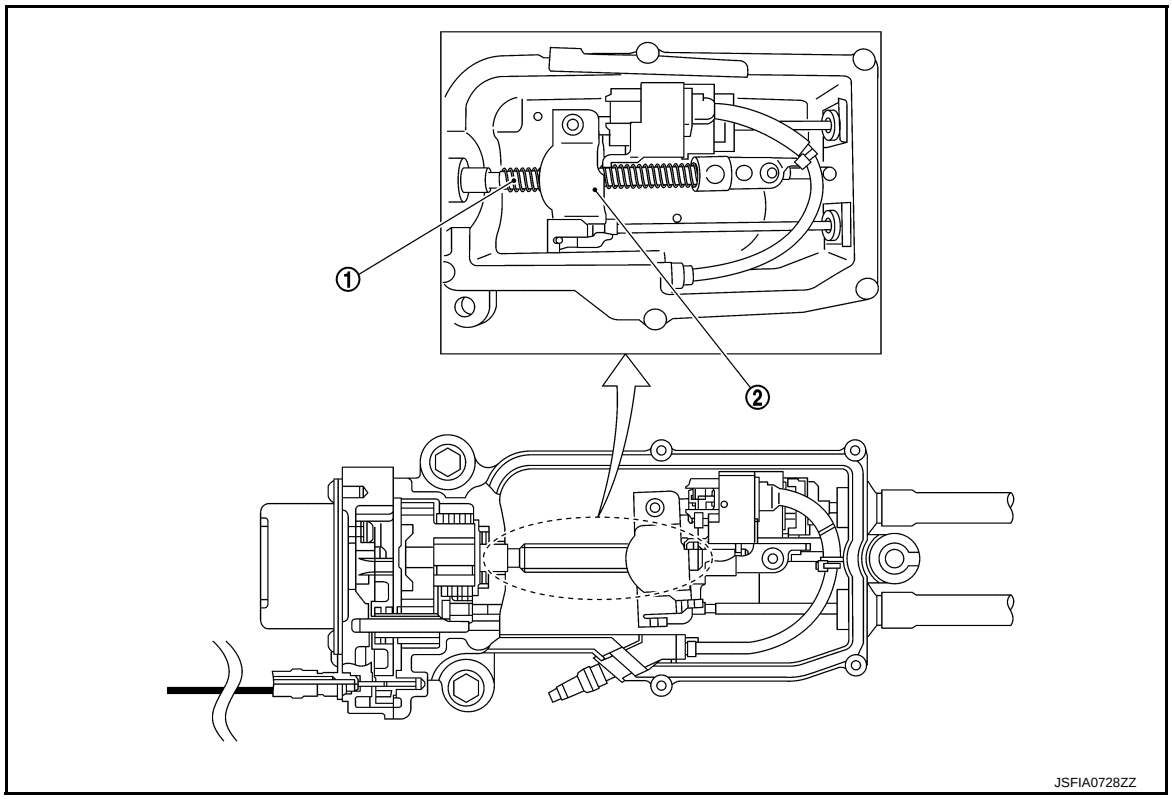
1. Reduction gear

Clutch
- Maintains shaft rotating torque.



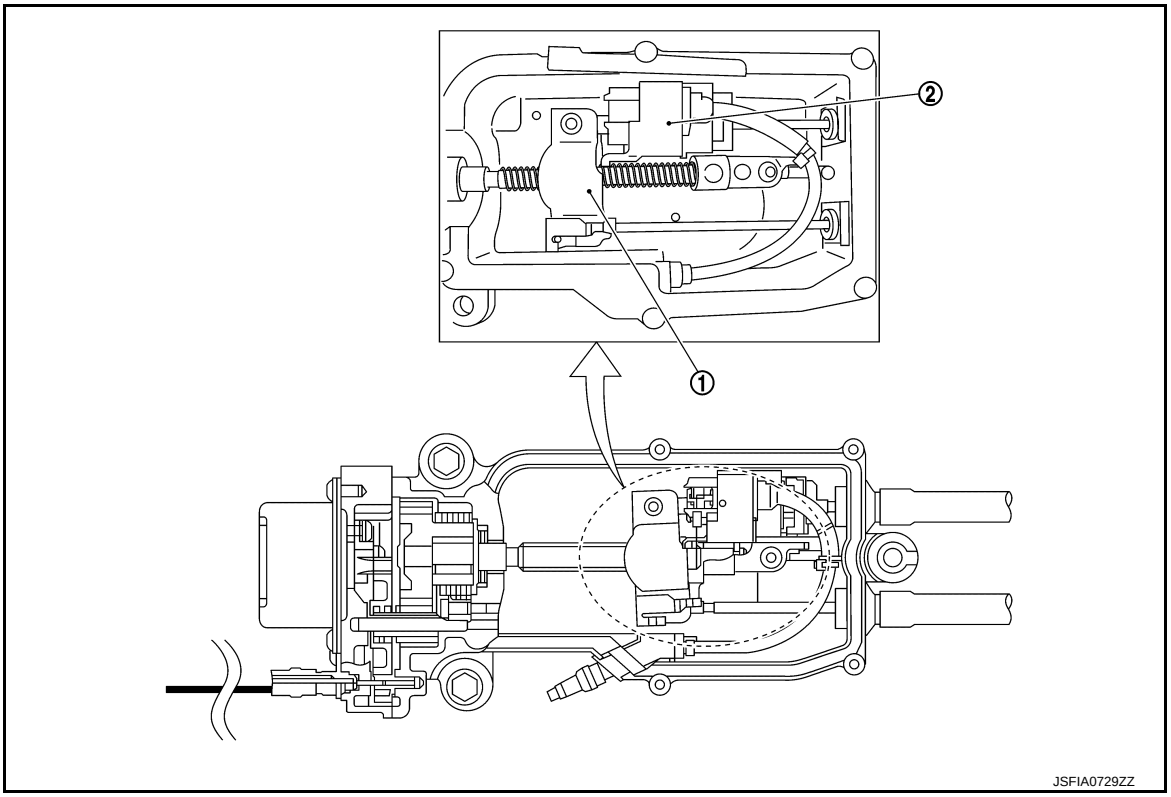
1. Clutch

Shaft
- The shaft is screw shaped and the equalizer is nut shaped. Rotating torque loaded to shaft is converted to cable tension through equalizer.



1. Shaft
2. Equalizer (tension sensor)

Equalizer (tension sensor)
- The equalizer and tension sensor are integrated.
- Equalize left and right cable tensions.
- This detects the tension applied to the rear cable and sends it to the electric parking brake control module.



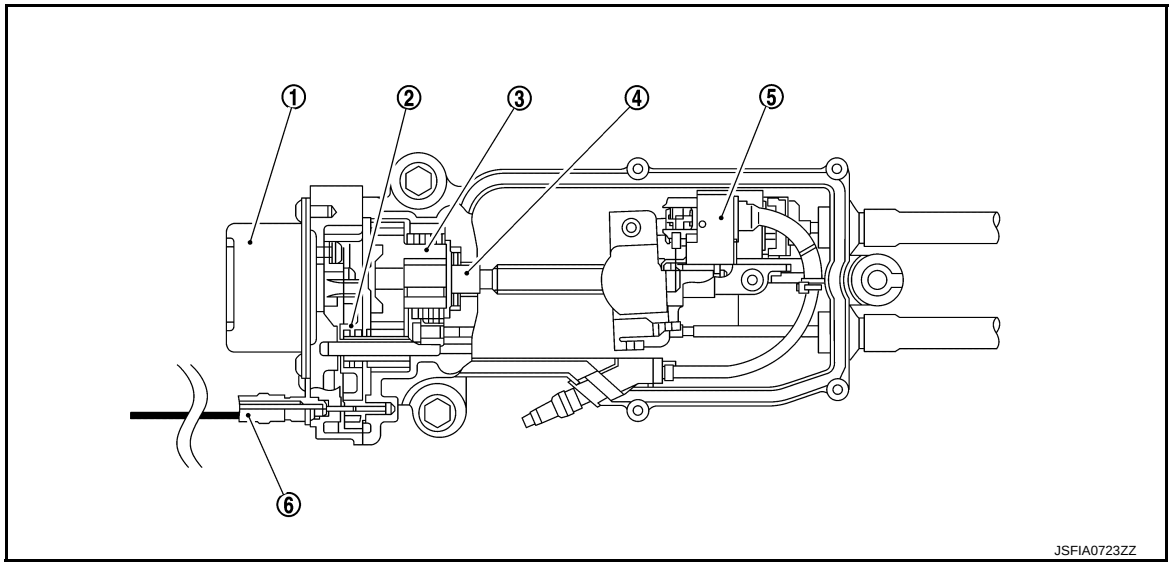
1. Equalizer
2. Tension sensor

SYSTEM

System Description

INFOID:0000000006960880

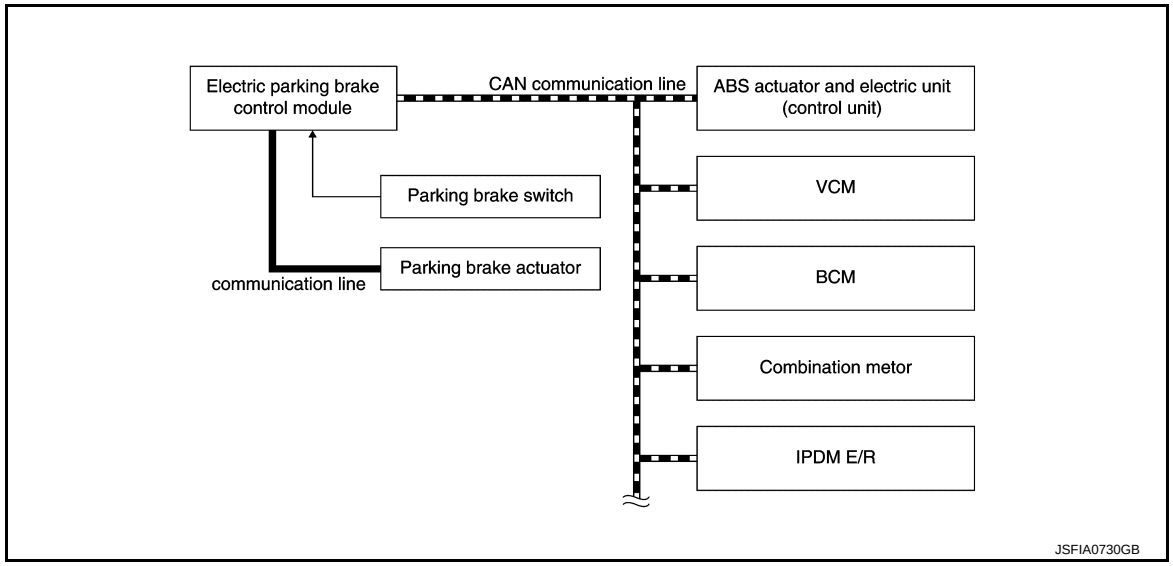
- When the parking brake is being operated, the electric parking brake indicator lamp in the combination meter and the parking brake switch indicator turn ON.
- When the parking brake is released, electric parking brake indicator lamp in the combination meter and the parking brake switch indicator turn OFF.
- This sends the parking brake switch operation signal to the electric parking brake control module.
- The electric parking brake control module drives the motor in the parking brake actuator.
- The motor generates the rotational starting torque, which is transmitted to the reduction gear → clutch → shaft → equalizer (tension sensor) → rear cable → parking brake shoe to apply and release the parking brake.



1. Motor
2. Reduction gear
3. Clutch
4. Shaft
5. Equalizer (tension sensor)
6. Emergency release cable

- When a malfunction occurs with the system, the master warning (yellow and red) turn ON and the function for entering the fail-safe status is held.
- When a malfunction occurs with the system and the parking brake cannot be released, release the parking brake manually. To release, remove the cap on release hole in luggage floor, press and rotate counterclockwise the emergency release cable until it locks.

SYSTEM DIAGRAM



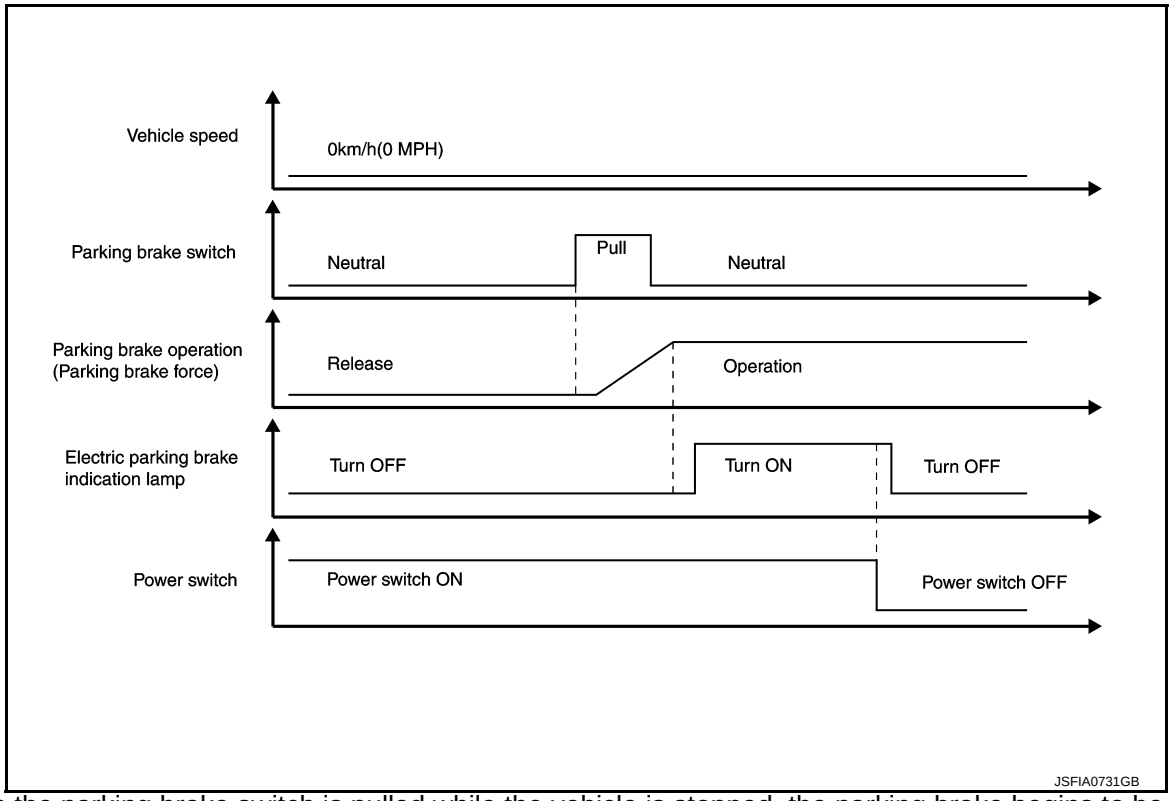
INPUT SIGNAL AND AUTPUT SIGNAL

Major signal transmission between each unit via communication lines is shown in the following table.

Component	Signal description
ABS actuator and electric unit (control unit)	Mainly transmits the following signals to electric parking brake control module via CAN communication. • Decel G signal • Rear LH Wheel speed signal • Rear RH Wheel speed signal • Vehicle speed signal (ABS)
VCM	Mainly transmits the following signals to electric parking brake control module via CAN communication. • Shift position signal • Accelerator pedal position signal • VCM status signal
IPDM E/R	Mainly transmits the following signals to electric parking brake control module via CAN communication. • Power switch signal
BCM	Mainly transmits the following signals to electric parking brake control module via CAN communication. • Stop lamp switch signal
Combination meter	Mainly transmits the following signals to electric parking brake control module via CAN communication. • Seat belt buckle switch signal (driver side) Mainly receives the following signals from electric parking brake control module via CAN communication. • Master warning signal • Electric parking brake indicator lamp signal

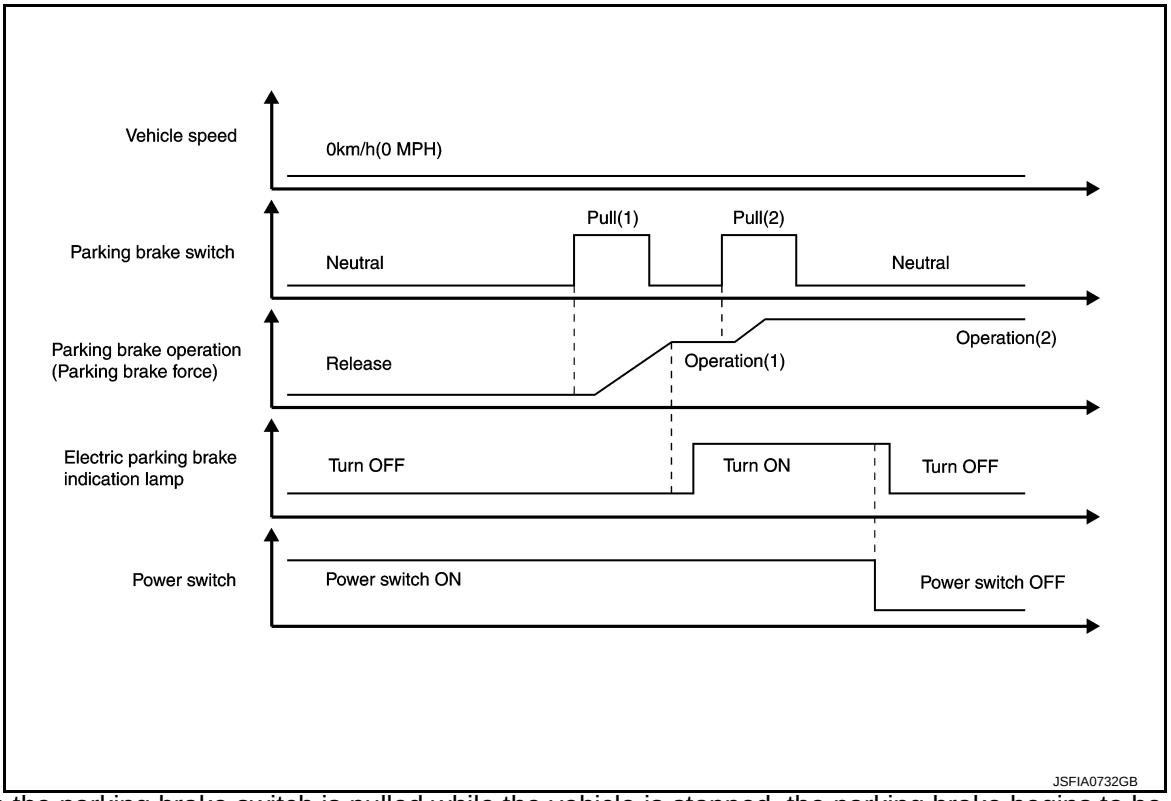
ELECTRIC PARKING BRAKE OPERATION

Normal Operation



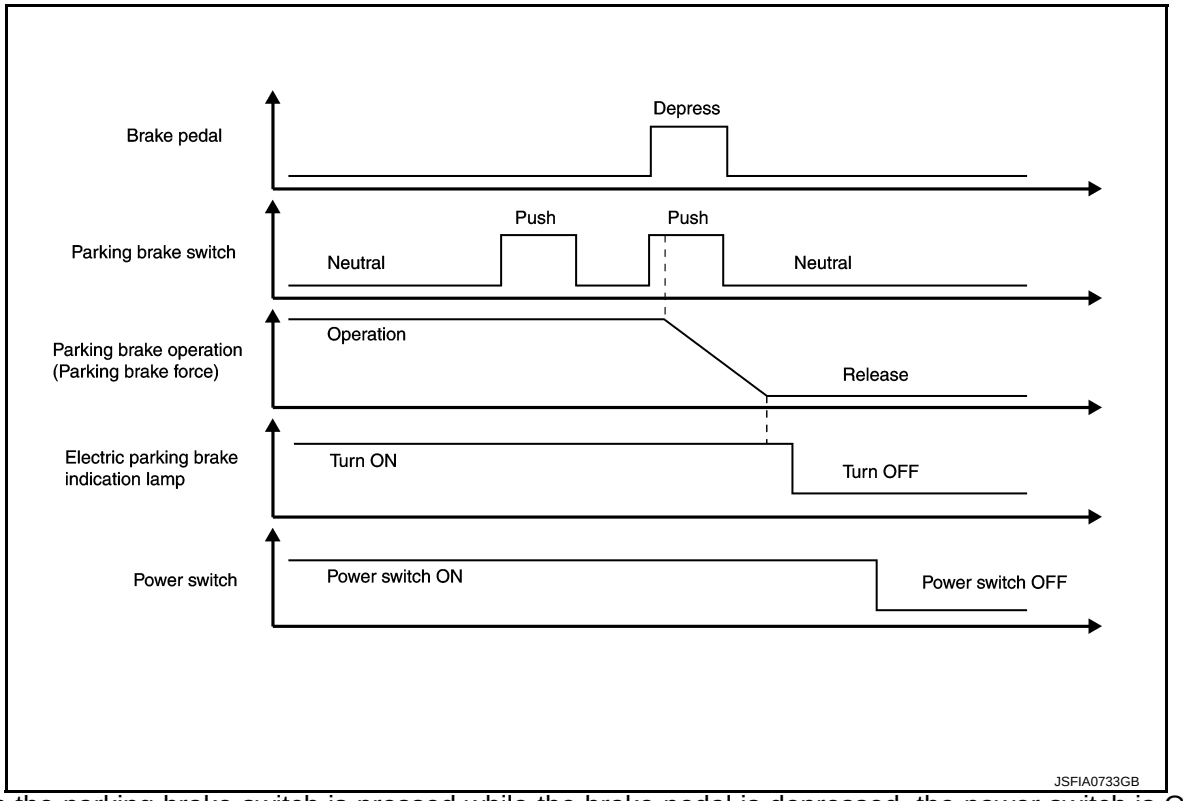
- When the parking brake switch is pulled while the vehicle is stopped, the parking brake begins to be applied (tensile force begins to be applied to the rear cable).
- When the parking brake braking force reaches the prescribed value (rear cable tensile force), the electric parking brake indicator lamp turns ON.
- When the power switch is turned OFF, the electric parking brake indicator lamp turns OFF.
  NOTE:
  Braking force of the parking brake is held.

Pull Twice



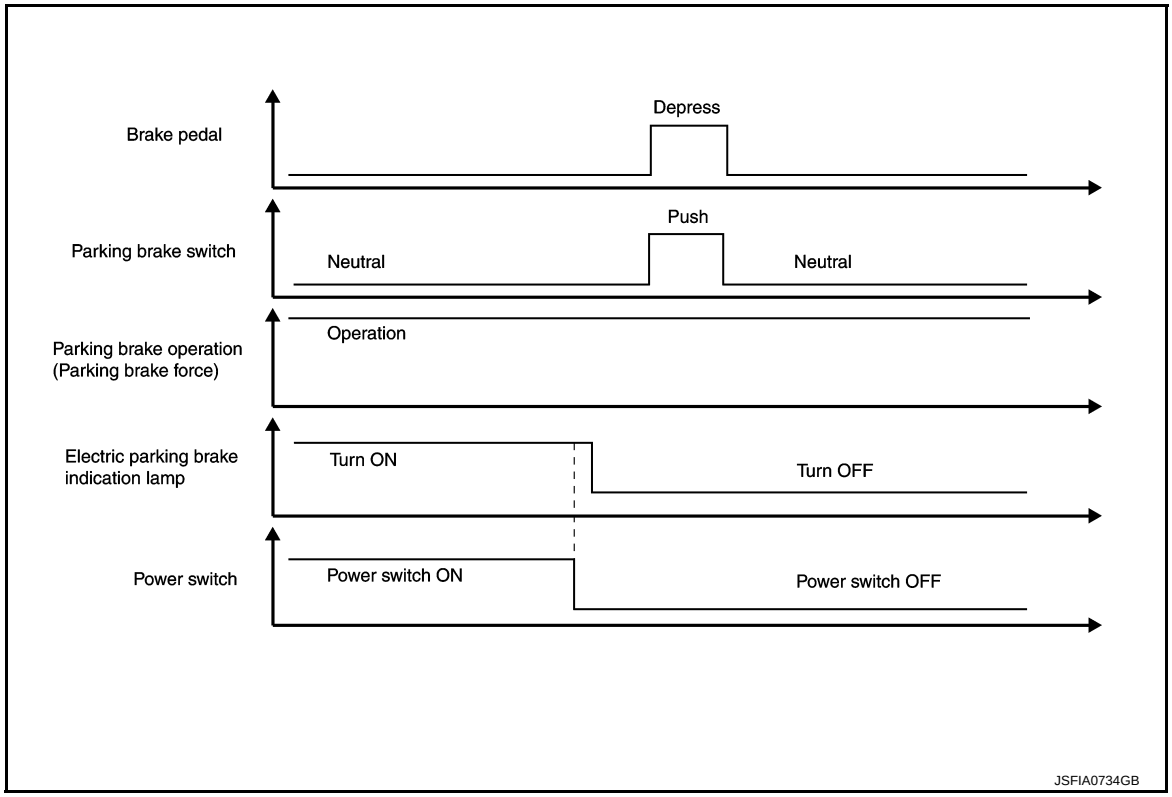
- When the parking brake switch is pulled while the vehicle is stopped, the parking brake begins to be applied (tensile force begins to be applied to the rear cable).
- When the parking brake braking force reaches the prescribed value (rear cable tensile force), the electric parking brake indicator lamp turns ON.
- Pulling the parking brake switch again increases the parking brake braking force (increases the rear cable tensile force).
  NOTE:
  Use this when you feel the parking brake braking force is insufficient, such as when parking on a slope, etc.
- When the power switch is turned OFF, the electric parking brake indicator lamp turns OFF.
  NOTE:
  Braking force of the parking brake is held.

Normal Release (power switch ON)



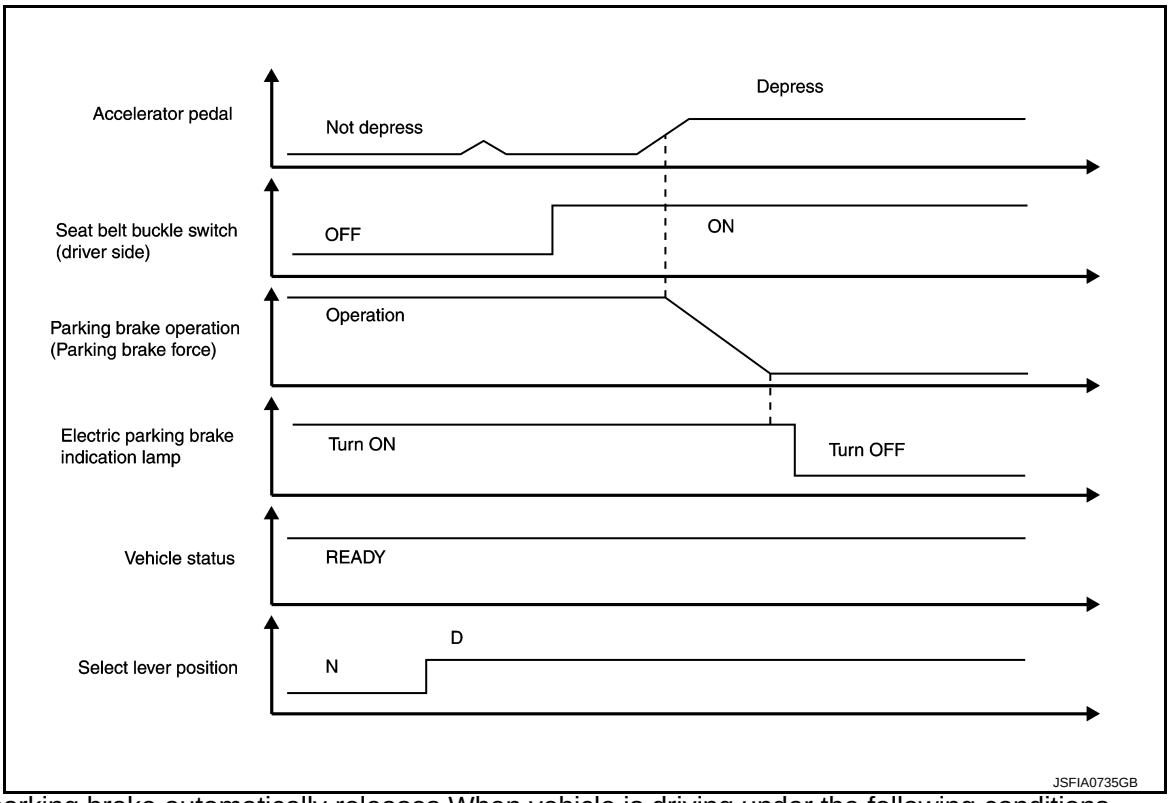
- When the parking brake switch is pressed while the brake pedal is depressed, the power switch is ON and the parking brake is operating the parking brake is released.
  NOTE:
  Just pressing the parking brake switch does not release the parking brake.
- When release of the parking brake is completed (tensile force on the rear cable disappears), the electric parking brake indicator lamp turns OFF.

Normal Release (power switch OFF)



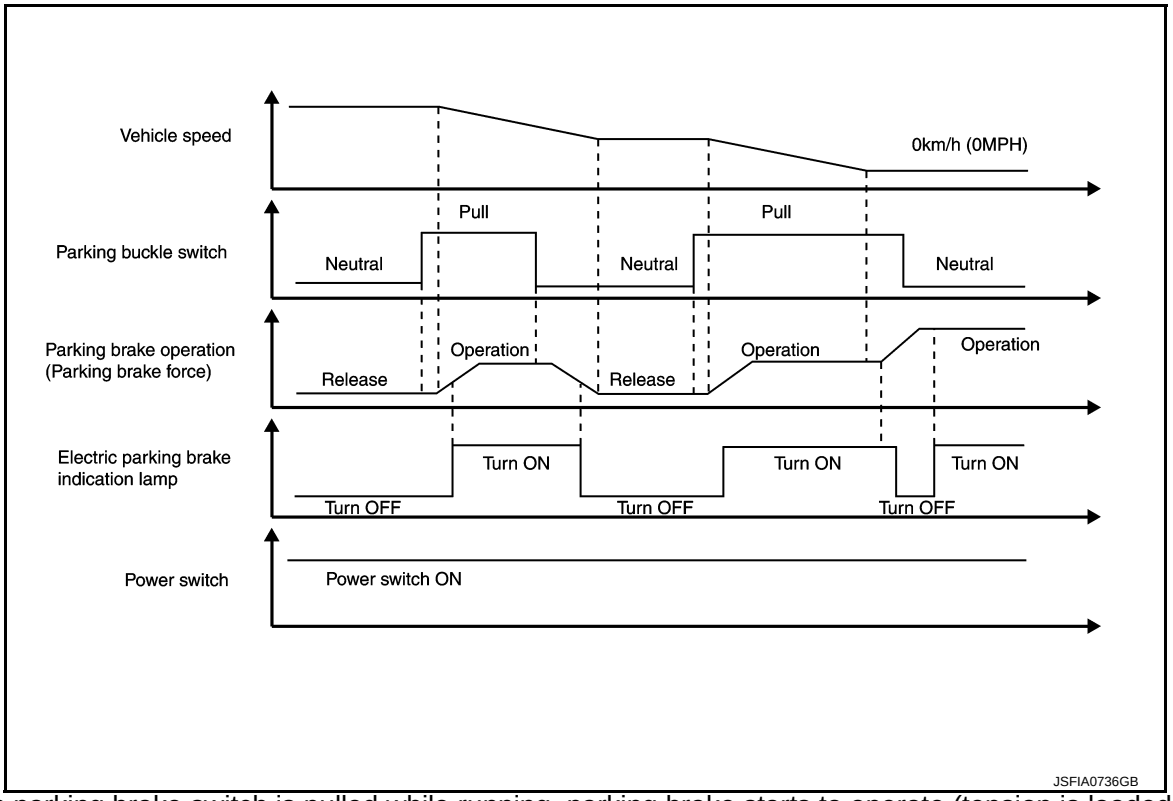
- The parking brake cannot be released by just pushing the parking brake switch while the power switch is OFF, the parking brake is applied, and the brake pedal is being depressed.
  NOTE:
  - Just pressing the parking brake switch does not release the parking brake.
  - The parking brake can be released by turning ON the power switch and pressing the parking brake switch while depressing the brake pedal.
- The electric parking brake indicator lamp turns OFF.
  NOTE:
  Braking force of the parking brake is in the hold status.

Automatic Release



- The parking brake automatically releases When vehicle is driving under the following conditions.
- Vehicle READY status
- The seat belt (driver side) is fastened.
- The select lever is in the D, R, ECO position.
- The accelerator pedal is depressed.
- When release of the parking brake is completed (tensile force on the rear cable disappears), the electric parking brake indicator lamp turns OFF.

Driving



- When parking brake switch is pulled while running, parking brake starts to operate (tension is loaded to rear cable), and electric parking brake indicator lamp illuminates. When pulling operation is stopped, the parking brake operation is canceled and electric parking brake indicator lamp turns OFF.
- When parking brake is pulled while driving immediately before the vehicle stops, the parking brake begins to be applied (tensile force begins being applied to the rear cable) and the electric parking brake indicator lamp turns ON.

  NOTE:

  The parking brake braking force is weaker than when the vehicle is stopped until the vehicle comes to a stop.
- When parking brake switch is pulled after vehicle stop, parking brake starts to operate again (tension is loaded to rear cable), and electric parking brake indicator lamp turns OFF.
- When the parking brake braking force reaches the prescribed value (rear cable tensile force), the electric parking brake indicator lamp turns ON.

CONDITION FOR TURN THE INDICATION LAMP AND WARNING LAMP

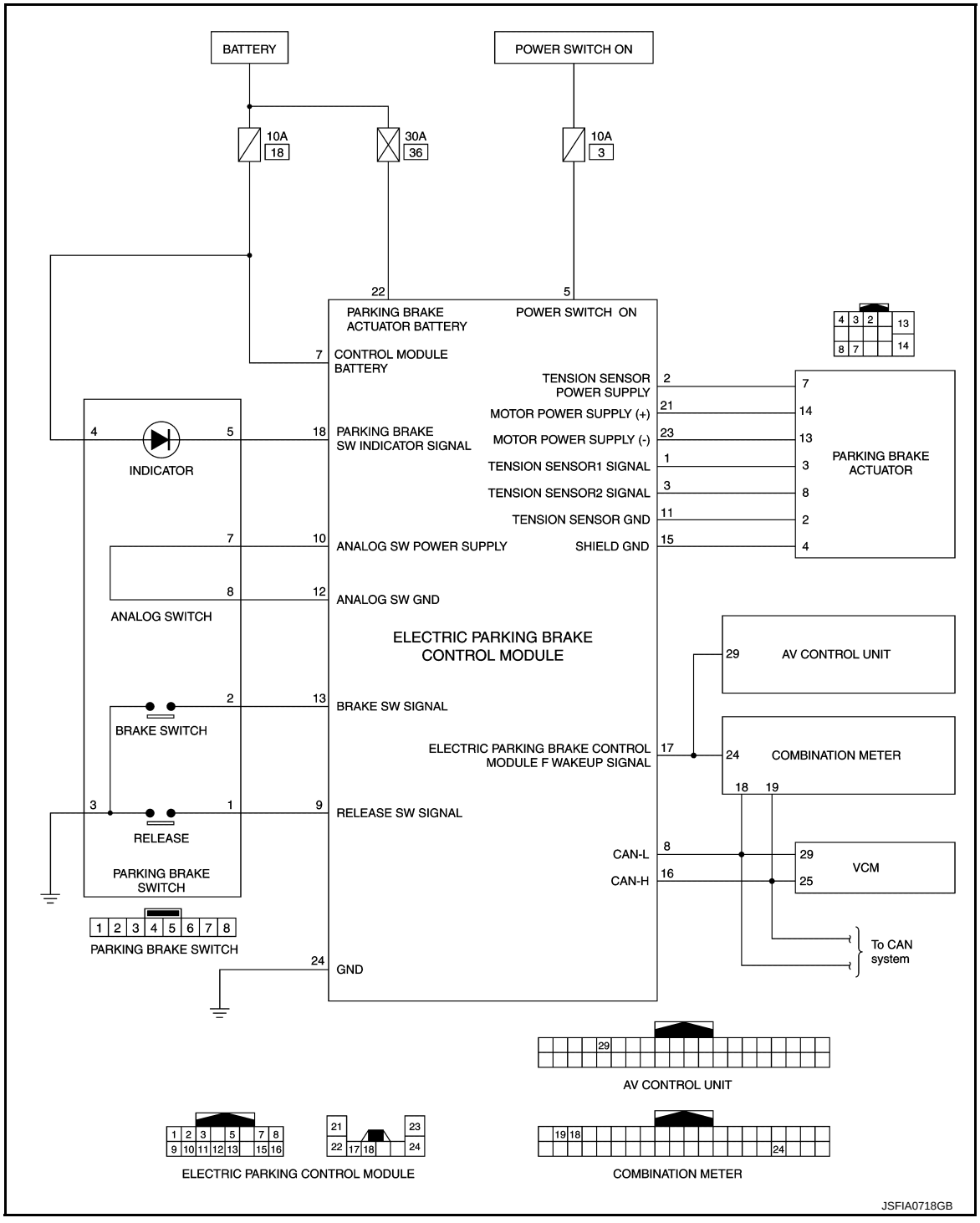
Turns ON when Power switch ON and OFF when the system is normal, for bulb check purposes.

Condition (status)	Electric parking brake indicator lamp	Master warning (yellow)	Master warning (red)	Meter text
Parking brake is operating	ON	OFF	ON	—
When the parking brake switch is pressed without depressing the brake pedal.	ON	ON	ON	Press brake pedal
When automatic release is performed while the seat belt is not fastened.	ON	OFF	ON	Release parking brake
When the parking brake is dragging while driving.	ON	OFF	ON	Release parking brake
When the parking brake braking force is insufficient (vehicle is moving backward).	ON	OFF	ON	Press brake pedal

Condition (status)	Electric parking brake indicator lamp	Master warning (yellow)	Master warning (red)	Meter text
When the electric parking brake system is overheated. (When the electric parking brake is being operated.)	ON	OFF	ON	Parking brake not available
When the electric parking brake system is overheated. (When the electric parking brake is released.)	OFF	OFF	ON	Parking brake not available
When the electric parking brake system is overheated. (When the parking brake switch is pulled.)	Blinking	OFF	ON	Parking brake not available
When a malfunction with the electric parking brake system is detected. (When the electric parking brake is being operated.)	ON	ON	ON	Visit dealer
When a malfunction with the electric parking brake system is detected. (When the electric parking brake is released.)	OFF	ON	OFF	Visit dealer
When parking brake switch is pulled/pushed under system malfunction and electric parking brake cannot be operated.	Blinking	ON	ON	Visit dealer
When a malfunction with the electric parking brake system is detected. (it is unclear when it is operating or released)	Blinking	ON	ON	Visit dealer

Schematic

INFOID:0000000006960881



Fail-Safe

INFOID:0000000006960882

- The master warning (yellow) turns ON when a malfunction with the system occurs.
- When parking brake switch is pulled/pushed under system malfunction, electric parking brake indicator lamp blinks and master warning (red) turns ON when electric parking brake cannot be operated. It restricts braking and release operations of electric parking brake.
  NOTE:
  The parking brake can be manually released.

DTC	Monitor item	Vehicle condition
C10C8	CONTROL MODULE SYSTEM INTERNAL MALFUNCTION	• Applying the brake is prohibited. • Release using the parking brake switch is prohibited. (It can be released only once or it can be released manually.)
	CONTROL MODULE INTERNAL ELECTRIC MALFUNCTN	Prohibits automatic cancel. (Manual release can be performed.)
C10E0	ACTUATOR ACTUATOR SLIPPING	• Applying the brake is prohibited. • Release using the parking brake switch is prohibited. (It can be released only once or it can be released manually.)
	ACTUATOR COMMANDED POS NOT REACH	
	ACTUATOR MECHANICAL LINKAGE MALFNCTN	
	ACTUATOR PERFORMANCE/INCRRCT OPERAT	
	ACTUATOR UNEXPECTED OPERATION	• Applying the brake is prohibited. • Prohibits automatic cancel. (Manual release can be performed.)
C10E1	MOTOR CIRCUIT	• Applying the brake is prohibited. • Release using the parking brake switch is prohibited. (It can be released manually.)
C10E2	MOTOR POWER SUPPLY	• Applying the brake is prohibited. • Release using the parking brake switch is prohibited. (It can be released manually.)
C10E3	PARKING BRAKE SWITCH	• Applying the brake is prohibited. • Release using the parking brake switch is prohibited. (It can be released automatically or manually.)
C10E4	TENSION SENSOR	• Applying the brake is prohibited. • Release using the parking brake switch is prohibited. (It can be released only once or it can be released manually.)
C10E5	POWER SUPPLY VOLTAGE	Applying the brake is prohibited. (It can be released using the parking brake switch or automatically.)
C10E6	IGNITION SWITCH	—
C10E7	OVER HEAT	Applying the brake is prohibited. (It can be released using the parking brake switch or automatically.)
U0100	ECM/PCM A	Automatic release is prohibited.
U0111	BATTERY ENERGY CONTROL MODULE A	—
U0129	BRAKE SYSTEM CONTROL MODULE	• Automatic release is prohibited. • Perform operation of stopped condition while driving
U0140	BCM	—
U0155	IPC CONTROL MODULE	Automatic release is prohibited.
U0401	VCM	Automatic release is prohibited.
U0418	BRAKE SYSTEM CONTROL MODULE	• Automatic release is prohibited. • Perform operation of stopped condition while driving
U0422	BCM	—
U1000	CAN COMM CIRCUIT	• Automatic release is prohibited. • Perform operation of stopped condition while driving

DIAGNOSIS SYSTEM (ELECTRIC PARKING BRAKE CONTROL MODULE)

CONSULT Function

INFOID:0000000006960883

APPLICATION ITEM

CONSULT can display each diagnostic item using the diagnostic test modes as follows.

Mode	Function description
ECU identification	Parts number of electric parking brake control module can be read.
Self Diagnostic Results	Self-diagnostic results and freeze frame data can be read and erased quickly.*
DATA MONITOR	Input/Output data in the electric parking brake control module can be read.
Work support	Components can be quickly and accurately adjusted.

*: The following diagnosis information is erased by erasing.

- DTC
- Freeze frame data (FFD)

ECU IDENTIFICATION

Electric parking brake control module part number can be read.

SELF DIAGNOSTIC RESULT

Refer to PB-29, "DTC Index".

When “CRNT” is displayed on self-diagnosis result
- The system is presently malfunctioning.

When “PAST” is displayed on self-diagnosis result
- System malfunction in the past is detected, but the system is presently normal.

Freeze Frame Data (FFD)
When DTC is detected, a vehicle status shown below is recorded and displayed on CONSULT.

Item name	Display item
IGN counter (0 – 39)	The number of times that power switch is ON after the DTC is detected is displayed. • When “0” is displayed: It indicates that the system is presently malfunctioning. • When except “0” is displayed: It indicates that system malfunction in the past is detected, but the system is presently normal. **NOTE:** Each time when power switch is turned OFF to ON, numerical number increases in 1 → 2 → 3...38 → 39. When the operation number of times exceeds 39, the number do not increase and “39” is displayed until self-diagnosis is erased.

DATA MONITOR

Item (Unit)	Note:
STATIC OPE FREQUENCY	Displays the number of times the electric parking brake is applied while the vehicle is stopped
DYNAMIC OPE FREQUENCY	Displays the number of times the electric parking brake is applied while the vehicle is being driven
TENSION SENSOR 1 (V)	Displays output voltage value of the tension sensor 1*
TENSION SENSOR 2 (V)	Displays output voltage value of the tension sensor 2*
POWER SUPPLY VOLTAGE (V)	Displays power supply voltage of the electric parking brake control module
TENSION SEN 1 MONITOR (N)	Displays the tensile force applied to the tension sensor 1*
TENSION SEN 2 MONITOR (N)	Displays the tensile force applied to the tension sensor 2*

Item (Unit)	Note:
TARGET LOAD (N)	Displays the target tensile force
BRAKE SWITCH (ON/OFF)	Displayed when the parking brake switch is pulled
RELEASE SWITCH (ON/OFF)	Displayed when the parking brake switch is pressed
ANALOG SWITCH (V)	Displays power supply voltage of the parking brake switch
MALFUNCTION STATUS (NORMAL/DEFECT/SEVERE)	Displays malfunction status of the electric parking brake system
PARKING BRAKE SATUS (NO DTR/RELEAS/LOCK/DR/LCK DR RLS)	Displays the electric parking brake system status
IGNITION SWITCH FROM IPDM (ON/OFF)	Displays the power switch ON signal from the IPDM E/R via CAN communication
BRAKE SWITCH FROM BCM (On/Off/INVALID)	Displays the stop lamp switch signal from the BCM via CAN communication
WHEEL SENSOR REAR RH (rpm)	Displays the rear RH wheel sensor signal from the ABS actuator and electric unit (control unit) via CAN communication
WHEEL SENSOR REAR LH (rpm)	Displays the rear LH wheel sensor signal from the ABS actuator and electric unit (control unit) via CAN communication
DECEL G SENSOR (G)	Displays the rear decel G signal from the ABS actuator and electric unit (control unit) via CAN communication
VEHICLE SPEED (km/h)	Displays the vehicle speed signal from the ABS actuator and electric unit (control unit) via CAN communication
ACCELE OPEN ANGLE (%)	Displays the accelerator pedal position signal from the VCM via CAN communication
ENGINE STATUS (STOP/Run)	Displays the traction motor status from the VCM via CAN communication
DIAG PROHIBIT (On/Off)	Displays the diagnostic status via CONSULT
SHIFT RANGE (LIMP/P/R/N/D)	Displays the shift position status from the VCM via CAN communication
BUCKLE SWITCH (ON/OFF)	Displays the seat belt buckle switch signal (driver side) signal from the combination meter via CAN communication

*: tension sensor has the tension sensor 1 and tension sensor 2 circuits.

WORK SUPPORT

Item	Description
ACTUATOR 0 POINT LEARNING	This conducts parking brake actuator 0 point learning.

ECU DIAGNOSIS INFORMATION

ELECTRIC PARKING BRAKE CONTROL MODULE

Reference Value

INFOID:0000000006960884

CONSULT DATA MONITOR STANDARD VALUE

Monitor item	Condition	Reference values in normal operation
STATIC OPE FREQUENCY	Always	Times applied while vehicle stopped
DYNAMIC OPE FREQUENCY	Always	Times applied while vehicle being driven
TENSION SENSOR 1 *1	Always	0.35 – 4.5 V
TENSION SENSOR 2*1	Always	0.35 – 4.5 V
POWER SUPPLY VOLTAGE	Always	11 – 14 V
TENSION SEN 1 MONITOR *1	Always	0 – 1500 N
TENSION SEN 2 MONITOR *1	Always	0 – 1500 N
TARGET LOAD	Always	0 – 1040 N
BRAKE SWITCH	Pull the parking brake switch	ON
	Other than the above	OFF
RELEASE SWITCH	Press the parking brake switch	ON
	Other than the above	OFF
ANALOG SWITCH	Active (When battery voltage is 11 –16 V)	0 – 0.8 V
	Not activated (When battery voltage is 11 –16 V)	2.8 – 5.5 V
MALFUNCTION STATUS	Normal	NORMAL
	When there is a malfunction with some functions	DEFECT
	When the system cannot operate	SEVERE
PARKING BRAKE STATUS	Unconfirmed	NO DTR
	Released status	RELEAS
	Operation status	LOCK
	Operate	DR LCK
	Being released	DR RLS
IGNITION SWITCH FROM IPDM	When the power switch is ON	ON
	Other than when power switch is ON	OFF
BRAKE SWITCH FROM BCM	Brake pedal depressed	On
	Brake pedal not depressed	Off
	When there is a stop lamp switch malfunction	INVALID
WHEEL SENSOR REAR RH	Vehicle stopped	0.00 rpm
	While driving*2	Almost same reading as speedometer (within ±10%)
WHEEL SENSOR REAR LH	Vehicle stopped	0.00 rpm
	While driving*2	Almost same reading as speedometer (within ±10%)

Monitor item	Condition	Reference values in normal operation
DECEL G SENSOR	Vehicle stopped	Approx. 0 G
	During acceleration	Positive value
	During deceleration	Negative value
VEHICLE SPEED	When stopped	0.00 km/h
	While driving*2	Almost same reading as speedometer (within ±10%)
ACCELE OPEN ANGLE	Do not depress the accelerator pedal (power switch ON)	0%
	Depress the accelerator pedal (power switch ON)	0 – 100%
ENGINE STATUS	When the traction motor is stopped	STOP
	When the traction motor is operating	Run
DIAG PROHIBIT	When diagnostic allowed	On
	When diagnostic prohibited	Off
SHIFT RANGE	When there is a sift position signal malfunction	LIMP
	When in the P position	P
	When in the R position	R
	When in the N position	N
	When in the D position	D
BUCKLE SWITCH	When the seat belt (driver side) is fastened	ON
	When the seat belt (driver side) is not fastened	OPEN

*1: The tension sensor has the tension sensor 1 and tension sensor 2 circuits.
*2: Check that tire pressure is standard value.

Fail-Safe

INFOID:0000000006960885

- The master warning (yellow) turns ON when a malfunction with the system occurs.
- When parking brake switch is pulled/pushed under system malfunction, electric parking brake indicator lamp blinks and master warning (red) turns ON when electric parking brake cannot be operated. It restricts braking and release operations of electric parking brake.
  NOTE:
  The parking brake can be manually released.

DTC	Monitor item	Vehicle condition
C10C8	CONTROL MODULE SYSTEM INTERNAL MALFUNCTION	• Applying the brake is prohibited. • Release using the parking brake switch is prohibited. (It can be released only once or it can be released manually.)
	CONTROL MODULE INTERNAL ELECTRIC MALFUNCTN	Prohibits automatic cancel. (Manual release can be performed.)
C10E0	ACTUATOR ACTUATOR SLIPPING	• Applying the brake is prohibited. • Release using the parking brake switch is prohibited. (It can be released only once or it can be released manually.)
	ACTUATOR COMMANDED POS NOT REACH	
	ACTUATOR MECHANICAL LINKAGE MALFNCTN	
	ACTUATOR PERFORMANCE/INCRRCT OPERAT	
	ACTUATOR UNEXPECTED OPERATION	• Applying the brake is prohibited. • Prohibits automatic cancel. (Manual release can be performed.)

DTC	Monitor item	Vehicle condition
C10E1	MOTOR CIRCUIT	• Applying the brake is prohibited. • Release using the parking brake switch is prohibited. (It can be released manually.)
C10E2	MOTOR POWER SUPPLY	• Applying the brake is prohibited. • Release using the parking brake switch is prohibited. (It can be released manually.)
C10E3	PARKING BRAKE SWITCH	• Applying the brake is prohibited. • Release using the parking brake switch is prohibited. (It can be released automatically or manually.)
C10E4	TENSION SENSOR	• Applying the brake is prohibited. • Release using the parking brake switch is prohibited. (It can be released only once or it can be released manually.)
C10E5	POWER SUPPLY VOLTAGE	Applying the brake is prohibited. (It can be released using the parking brake switch or automatically.)
C10E6	IGNITION SWITCH	—
C10E7	OVER HEAT	Applying the brake is prohibited. (It can be released using the parking brake switch or automatically.)
U0100	ECM/PCM A	Automatic release is prohibited.
U0111	BATTERY ENERGY CONTROL MODULE A	—
U0129	BRAKE SYSTEM CONTROL MODULE	• Automatic release is prohibited. • Perform operation of stopped condition while driving
U0140	BCM	—
U0155	IPC CONTROL MODULE	Automatic release is prohibited.
U0401	VCM	Automatic release is prohibited.
U0418	BRAKE SYSTEM CONTROL MODULE	• Automatic release is prohibited. • Perform operation of stopped condition while driving
U0422	BCM	—
U1000	CAN COMM CIRCUIT	• Automatic release is prohibited. • Perform operation of stopped condition while driving

DTC Inspection Priority Chart

INFOID:0000000006960886

When multiple DTCs are displayed simultaneously, check one by one according to the following priority list.

Priority	Detected item (DTC)
1	• C10C8 CONTROL MODULE
2	• U0100 ECM/PCM A • U0111 BATTERY ENERGY CONTROL MODULE A • U0129 BRAKE SYSTEM CONTROL MODULE • U0140 BCM • U0155 IPC CONTROL MODULE • U0401 VCM • U0418 BRAKE SYSTEM CONTROL MODULE • U0422 BCM • U1000 CAN COMM CIRCUIT
3	• C10E3 PARKING BRAKE SWITCH
4	• C10E1 MOTOR CIRCUIT • C10E2 MOTOR POWER SUPPLY • C10E5 POWER SUPPLY VOLTAGE • C10E6 IGNITION SWITCH
5	• C10E0 ACTUATOR • C10E4 TENSION SENSOR • C10E7 OVER HEAT

DTC Index

INFOID:0000000006960887

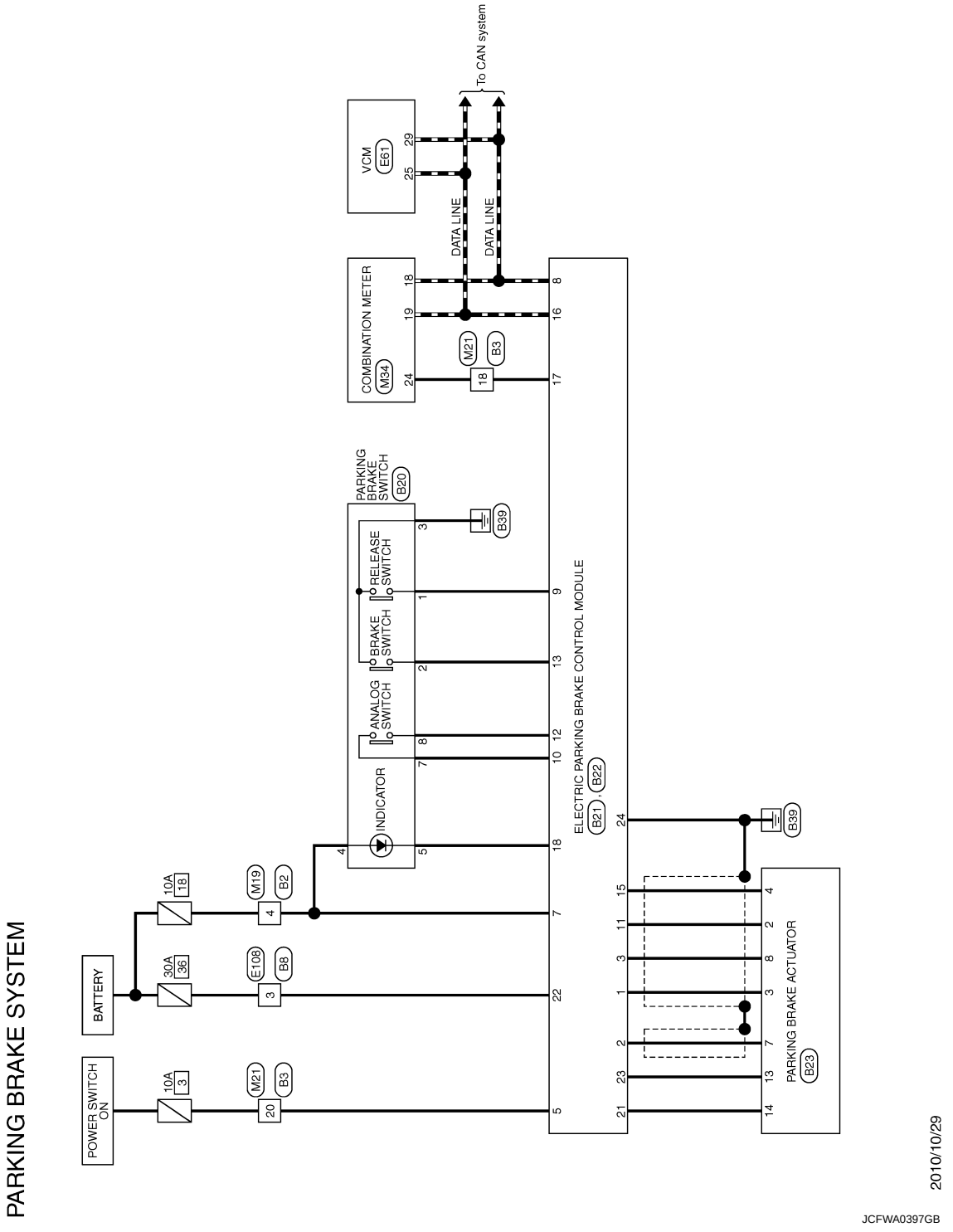
DTC	Display item	Refer to
C10C8	CONTROL MODULE	PB-40, "DTC Logic"
C10E0	ACTUATOR	PB-42, "DTC Logic"
C10E1	MOTOR CIRCUIT	PB-50, "DTC Logic"
C10E2	MOTOR POWER SUPPLY	PB-52, "DTC Logic"
C10E3	PARKING BRAKE SWITCH	PB-54, "DTC Logic"
C10E4	TENSION SENSOR	PB-57, "DTC Logic"
C10E5	POWER SUPPLY VOLTAGE	PB-59, "DTC Logic"
C10E6	IGNITION SWITCH	PB-61, "DTC Logic"
C10E7	OVER HEAT	PB-63, "DTC Logic"
U0100	ECM/PCM A	PB-64, "DTC Logic"
U0111	BATTERY ENERGY CONTROL MODULE A	PB-65, "DTC Logic"
U0129	BRAKE SYSTEM CONTROL MODULE	PB-66, "DTC Logic"
U0140	BCM	PB-67, "DTC Logic"
U0155	IPC CONTROL MODULE	PB-68, "DTC Logic"
U0401	VCM	PB-69, "DTC Logic"
U0418	BRAKE SYSTEM CONTROL MODULE	PB-70, "DTC Logic"
U0422	BCM	PB-71, "DTC Logic"
U1000	CAN COMM CIRCUIT	PB-72, "DTC Logic"

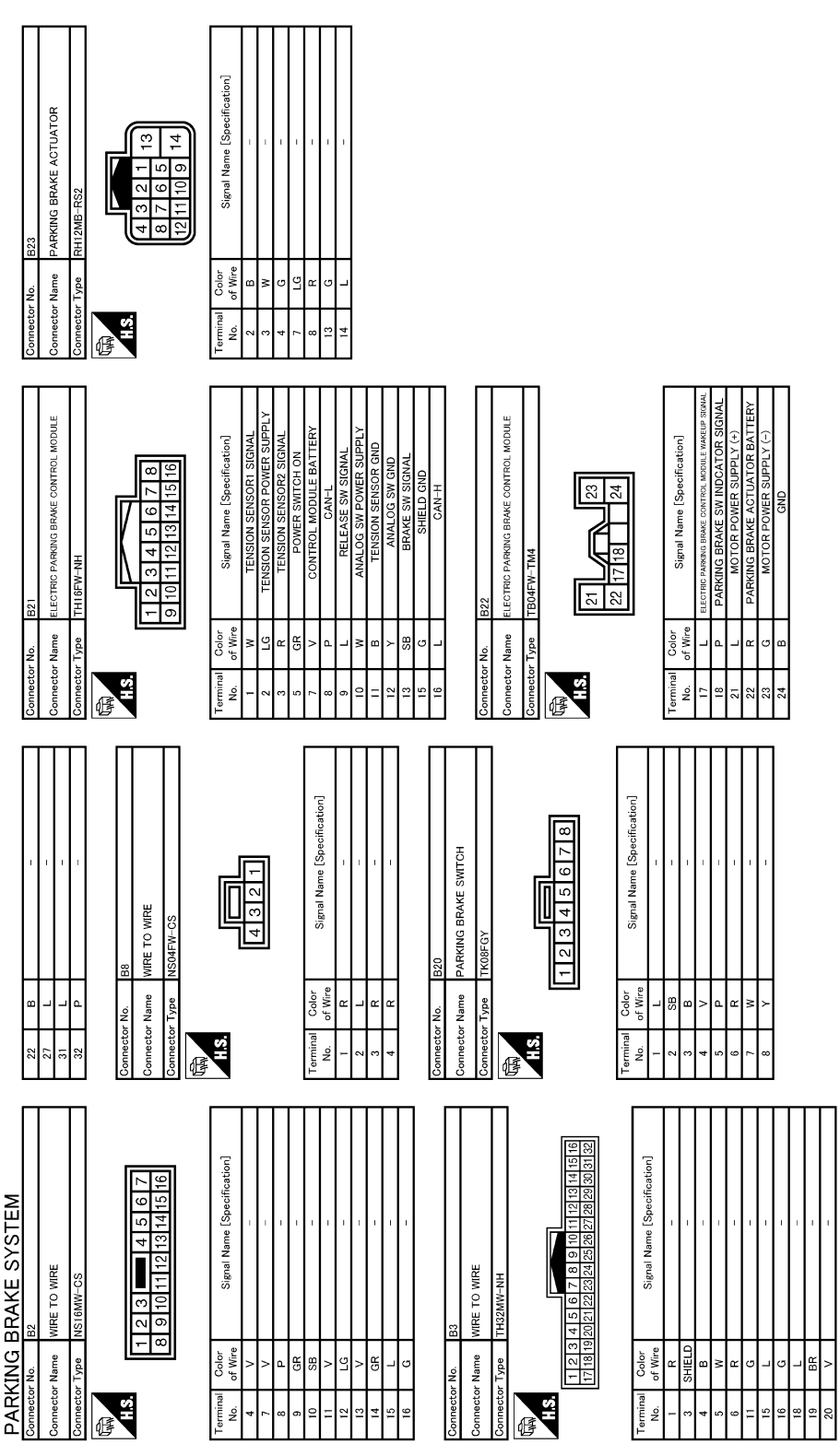
WIRING DIAGRAM

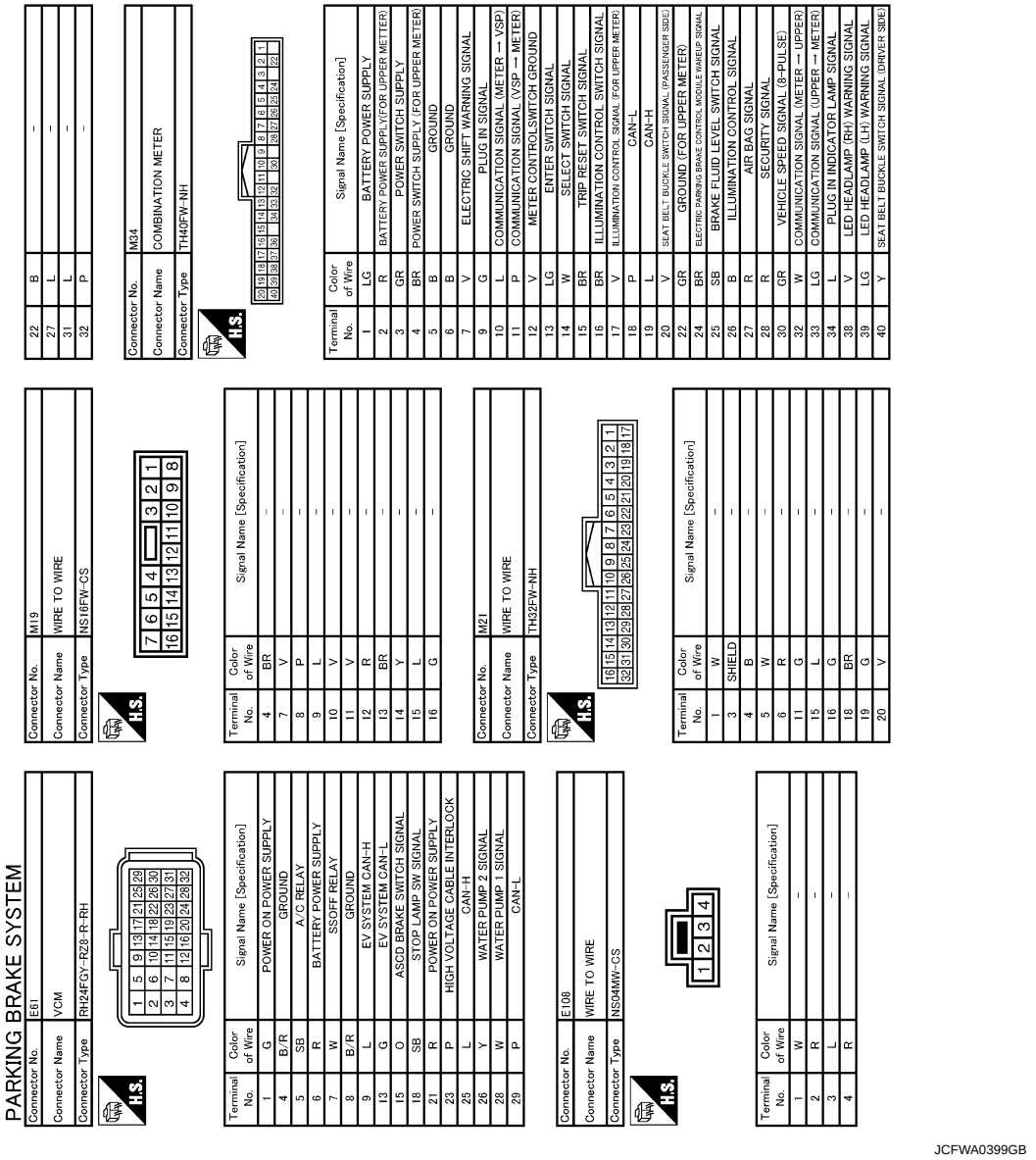
PARKING BRAKE SYSTEM

Wiring Diagram

INFOID:0000000006960888




PARKING BRAKE SYSTEM
Connector No. B2
Connector Name WIRE TO WIRE
Connector Type NS16MW-CS
H.S.
1 2 3 4 5 6 7
8 9 10 11 12 13 14 15 16
Terminal No. Color of Wire Signal Name [Specification]
4 V –
7 V –
8 P –
9 GR –
10 SB –
11 V –
12 LG –
13 V –
14 GR –
15 L –
16 G –
Connector No. B3
Connector Name WIRE TO WIRE
Connector Type TH32MW-NH
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
Terminal No. Color of Wire Signal Name [Specification]
1 R –
3 SHIELD –
4 B –
5 W –
6 R –
11 G –
15 L –
16 G –
18 L –
19 BR –
20 V –
22 B –
27 L –
31 L –
32 P –
Connector No. B8
Connector Name WIRE TO WIRE
Connector Type NS04FW-CS
H.S.
4 3 2 1
Terminal No. Color of Wire Signal Name [Specification]
1 R –
2 L –
3 R –
4 R –
Connector No. B20
Connector Name PARKING BRAKE SWITCH
Connector Type TK08FGY
H.S.
1 2 3 4 5 6 7 8
Terminal No. Color of Wire Signal Name [Specification]
1 L –
2 SB –
3 B –
4 V –
5 P –
6 R –
7 W –
8 Y –
Connector No. B21
Connector Name ELECTRIC PARKING BRAKE CONTROL MODULE
Connector Type TH16FW-NH
H.S.
1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16
Terminal No. Color of Wire Signal Name [Specification]
1 W TENSION SENSOR1 SIGNAL
2 LG TENSION SENSOR POWER SUPPLY
3 R TENSION SENSOR2 SIGNAL
5 GR POWER SWITCH ON
7 V CONTROL MODULE BATTERY
8 P CAN-L
9 L RELEASE SW SIGNAL
10 W ANALOG SW POWER SUPPLY
11 B TENSION SENSOR GND
12 Y ANALOG SW GND
13 SB BRAKE SW SIGNAL
15 G SHIELD GND
16 L CAN-H
Connector No. B22
Connector Name ELECTRIC PARKING BRAKE CONTROL MODULE
Connector Type TB04FW-TM4
H.S.
21 23
22 17 18 24
Terminal No. Color of Wire Signal Name [Specification]
17 L ELECTRIC PARKING BRAKE CONTROL MODULE WAKEUP SIGNAL
18 P PARKING BRAKE SW INDICATOR SIGNAL
21 L MOTOR POWER SUPPLY (+)
22 R PARKING BRAKE ACTUATOR BATTERY
23 G MOTOR POWER SUPPLY (–)
24 B GND
Connector No. B23
Connector Name PARKING BRAKE ACTUATOR
Connector Type RH12MB-RS2
H.S.
4 3 2 1 13
8 7 6 5 14
12 11 10 9
Terminal No. Color of Wire Signal Name [Specification]
2 B –
3 W –
4 G –
7 LG –
8 R –
13 G –
14 L –
JCFWA0398GB



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BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000006960889

DETAILS OF TROUBLE DIAGNOSIS FLOWCHART

1.COLLECT THE INFORMATION FROM THE CUSTOMER

It is also important to clarify customer concerns before starting the inspection. First of all, perform an interview utilizing PB-34, "Diagnostic Work Sheet" and reproduce the symptom as well as fully understand it. Depending on the situations, drive the vehicle with the customer and check the symptom.

CAUTION:

Customers are not professionals. Never guess easily like “maybe the customer means that...,” or “maybe the customer mentions this symptom”.

>> GO TO 2.

2.CHECK SYMPTOM

Reproduce the symptom that is indicated by the customer, based on the information from the customer obtained by interview. Also check that the symptom is not caused by fail-safe mode. Refer to PB-27, "Fail-Safe".

CAUTION:

When the symptom is caused by normal operation, fully inspect each portion and obtain the understanding of customer that the symptom is not caused by a malfunction.

>> GO TO 3.

3.PERFORM SELF-DIAGNOSIS

With CONSULT

Perform “EHS/PKB”self-diagnosis

Is DTC detected?

YES >> Record or print self-diagnosis results. GO TO 4.

NO >> GO TO 6.

4.RECHECK THE SYMPTOM

With CONSULT

1. Erase self-diagnosis results from the memory.
2. Perform DTC reproduction procedures for the system that is malfunctioning.

   NOTE:

   If multiple DTCs are detected, refer to PB-28, "DTC Inspection Priority Chart" and determine the order for performing the diagnosis.

Is DTC detected?

YES >> GO TO 5.

NO >> Check harness and connectors based on the information obtained by interview. Refer to GI-51, "Intermittent Incident".

5.REPAIR OR REPLACE MALFUNCTIONING PART

Repair or replace the part that is malfunctioning. Reconnect part or connector after repairing or replacing. Erase DTC from the memory when DTC is detected.

>> GO TO 6.

6.IDENTIFY MALFUNCTIONING SYSTEM BY SYMPTOM DIAGNOSIS

Determine malfunctioning system according to the possible symptoms based on symptom diagnosis and perform check.

Can the malfunctioning part be identified?

YES >> GO TO 7.
NO >> Check harness and connectors based on the information obtained by interview. Refer to GI-51, "Intermittent Incident".

7. FINAL CHECK

With CONSULT
1. Check the reference value for “EHS/PKB”. Refer to PB-26, "Reference Value".
2. Check the operation. Check that the symptom is not reproduced under the same conditions that reproduced the symptom before.

Is the symptom reproduced?

YES >> GO TO 3.
NO >> INSPECTION END

Diagnostic Work Sheet

INFOID:0000000006960890

DESCRIPTION

- In general, customers have their own criteria for a problem. Therefore, it is important to understand the symptom and status well enough by asking the customer about his/her concerns carefully. To systemize all the information for the diagnosis, prepare the interview sheet referring to the interview points.
- In some cases, multiple conditions that appear simultaneously may cause a DTC to be detected.

INTERVIEW SHEET SAMPLE

Interview sheet

Customer name	MR/MS	Registration number		Initial year registration	
		Vehicle type		VIN	
Storage date		Traction motor		Mileage	km (Mile)
Situation where malfunction is occurred	Malfunction category	☐ Unable to brake ☐ Unable to release ☐ Generates abnormal sound ☐ Vehicle does not stop despite braking operation ☐ Parking brake continues breaking despite release operation ☐ Hooked at automatic release operation ☐ Vehicle slides down at automatic release operation ☐ Electric parking brake indicator lamp does not turns ON ☐ Electric parking brake indicator lamp keep turns ON ☐ Electric parking brake indicator lamp blinks ☐ Master warning turns ON ☐ A text displayed on combination meter			
		Detailed symptom			
		Detailed abnormal sound			
	Select lever position	☐ P ☐ R ☐N ☐ D			
	Seat belt operation	☐ OFF ☐ ON			
	Brake pedal status	☐ Not depress ☐ Depress			
	Electric parking brake status	☐ At release operation ☐ At braking operation ☐ During release ☐ During braking ☐ Continuously			
	Vehicle status	☐ Power switch OFF ☐ Power switch ACC ☐ Power switch ON ☐ READY			
	Vehicle running status	☐ At start with shift in D-range ☐ While driving with shift in D-range ☐ When stopped with shift in D-range ☐ At start with shift in R-range ☐ While driving with shift in R-range ☐ When stopped with shift in R-range ☐ When stopped with shift in N-range ☐ When stopped with shift in P-range ☐ Low speed (while driving) ☐ Normal speed (while driving) ☐ High speed (while driving)			
	Road condition	☐ Steep downhill road ☐ Gentle downhill road ☐ Flat road ☐ Gentle uphill road ☐ Steep uphill road			
	Number of occupants	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1			
	Vehicle loading condition (quantity)				
	Manual release history				

Interview sheet					
Customer name	MR/MS	Registration number		Initial year registration	
		Vehicle type		VIN	
Storage date		Traction motor		Mileage	km (Mile)
Inspection result	Self-diagnosis result				
	12V battery condition	☐ Normal	☐ Abnormal ( )		☐ Not confirmed
	Harness and connector condition	☐ Normal	☐ Abnormal ( )		☐ Not confirmed
	Parking brake cable mounting condition	☐ Normal	☐ Abnormal ( )		☐ Not confirmed
	Bracket deformed condition	☐ Normal	☐ Abnormal ( )		☐ Not confirmed
	Parking brake shoe wear condition	☐ Normal	☐ Abnormal ( )		☐ Not confirmed
	Other condition				

ADDITIONAL SERVICE WHEN REMOVING BATTERY NEGATIVE TERMINAL

Description

INFOID:0000000006960891

Disconnecting the 12V battery negative terminal with the parking brake on, prevents the parking brake from releasing. To release, remove the cap on release hole in luggage floor, press and rotate counterclockwise the emergency release cable until it locks.

PARKING BRAKE ACTUATOR 0 POINT LEARNING

Description

INFOID:0000000006960893

CAUTION:
When following operations are performed, always perform parking brake actuator 0 point learning before driving.

×: Required —: not required

Procedure	Parking brake actuator 0 point learning
When electric parking brake control module is removed and reinstalled	—
When electric parking brake control module is replaced	—
When parking brake actuator is removed and reinstalled	×
When parking brake actuator is replaced	×
When parking brake shoe is removed and reinstalled	×
When parking brake shoe is replaced	×
When parking brake switch is removed and reinstalled	—
When parking brake switch is replaced	—

Work Procedure

INFOID:0000000006960894

CAUTION:
Be sure to use CONSULT to perform parking brake actuator 0 point learning. (Learning is not possible without CONSULT.)

1.VEHICLE CONDITION

1. Stop the vehicle.
2. Turn the power switch OFF.

>> GO TO 2.

2.CHECK ELECTRIC PARKING BRAKE COMPONENTS INSTALLATION STATUS CHECK

Check the installation status of the electric parking brake components.

Is the check result normal?

YES >> GO TO 3.
NO >> For repair or replacement of defective parts, GO TO 3.

3.PERFORM THE SELF-DIAGNOSIS (1)

With CONSULT
Perform “EHS/PKB” self-diagnosis

Is malfunction detected?

YES >> Check the DTC. Refer to PB-29, "DTC Index". GO TO 4.
NO >> GO TO 4.

4.PERFORM PARKING BRAKE ACTUATOR 0 POINT LEARNING.

With CONSULT
1. Select “EHS/PKB”, “WORK SUPPORT” and “ACTUATOR 0 POINT LEARNING” according this order.
   CAUTION:
   Never operate the parking brake switch.
2. Touch “START”

>> GO TO 5.

5.PERFORM THE SELF-DIAGNOSIS (2)

With CONSULT
1. Pull parking brake switch to activate electric parking brake.
2. Push parking brake switch to release electric parking brake.

3. Perform “EHS/PKB” self-diagnosis

Is malfunction detected?

YES >> Check the DTC. Refer to PB-29, "DTC Index". GO TO 6.
NO >> Check harnesses and connectors based on information obtained by interview sheet. Refer to PB-34, "Diagnostic Work Sheet".

6. CHECK DATA MONITOR

With CONSULT
Select “EHS/PKB”, “DATA MONITOR”, “TENSION SEN 1 MONITOR” and “TENSION SENSOR 2 MONITOR” according to this order. Check that signals are within specified value.

TENSION SEN 1 MONITOR : 0 N
TENSION SEN 1 MONITOR : 0 N

Is the check result normal?

YES >> GO TO 7.
NO >> GO TO 1.

7. ERASE SELF-DIAGNOSIS MEMORY

With CONSULT
1. Turn the power switch OFF and then ON again.
   CAUTION:
   Be sure to perform the above operation.
2. Erase self-diagnosis results memory of “EHS/PKB”

Is the memory erased?

YES >> INSPECTION END
NO >> Check the items indicated by the self-diagnosis.

DTC/CIRCUIT DIAGNOSIS

C10C8 ELECTRIC PARKING BRAKE CONTROL MODULE

DTC Logic

INFOID:0000000006960895

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C10C8	CONTROL MODULE SYSTEM INTERNAL MALFUNCTION	When there is an internal malfunction in the electric parking brake control module.	• Harness and connector • Electric parking brake control module • Parking brake switch
	CONTROL MODULE INTERNAL ELECTRIC MALFUNCTN		

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn power switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT
1. Turn the power switch OFF to ON.
2. Perform self-diagnosis for “EHS/PKB”.

Is DTC “C10C8” detected?

YES (CONTROL MODULE SYSTEM INTERNAL MALFUNCTION)>>Proceed to PB-40, "SYSTEM INTERNAL MALFUNCTION : Diagnosis Procedure".
YES (CONTROL MODULE INTERNAL ELECTRIC MALFUNCTN)>>Proceed to PB-40, "INTERNAL ELECTRIC MALFUNCTN : Diagnosis Procedure".
NO >> INSPECTION END

SYSTEM INTERNAL MALFUNCTION

SYSTEM INTERNAL MALFUNCTION : Diagnosis Procedure

INFOID:0000000006960896

1. REPLACE PARKING BRAKE CONTROL MODULE

Replace electric parking brake control module even if other display than “C10C8” (CONTROL MODULE SYSTEM INTERNAL MALFUNCTION) is displayed in self-diagnosis for “EHS/PKB”.

>> Replace electric parking brake control module. Refer to PB-83, "Removal and Installation".

INTERNAL ELECTRIC MALFUNCTN

INTERNAL ELECTRIC MALFUNCTN : Diagnosis Procedure

INFOID:0000000006960897

1. CHECK PARKING BRAKE SWITCH

Check the parking brake switch. Refer to PB-54, "Diagnosis Procedure".

Is inspection result normal?

YES >> GO TO 2.
MO >> Replace the parking brake switch. Refer to PB-90, "Removal and Installation".

2. CHECK PARKING BRAKE SWITCH CIRCUIT

1. Turn the power switch OFF.
2. Disconnect electric parking brake control module harness connector.
3. Disconnect parking brake switch harness connector.

4. Check continuity between electric parking brake control module harness connector and parking brake switch harness connector.

Electric parking brake control module		Parking brake switch		Continuity
Connector	Terminal	Connector	Terminal	
B21	13	B20	2	Existed

5. Check continuity between electric parking brake control module harness connector and ground.

Electric parking brake control module		—	Continuity
Connector	Terminal		
B21	13	Ground	Not existed

Is inspection result normal?

YES >> Replace electric parking brake control module. Refer to PB-83, "Removal and Installation".
NO >> Repair or replace error-detected parts.

C10E0 PARKING BRAKE ACTUATOR

DTC Logic

INFOID:0000000006960898

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C10E0	ACTUATOR ACTUATOR SLIPPING	When motor and reduction gear within parking brake actuator is spinning.	• parking brake actuator • Cable
	ACTUATOR COMMANDED POS NOT REACH	When motor and reduction gear within parking brake actuator is locked.	
	ACTUATOR MECHANICAL LINKAGE MALFNCTN	When parking brake control is not completed.	
	ACTUATOR PERFORMANCE/ INCRRCT OPERAT	• When cable is stuck. • When cable is broken.	
	ACTUATOR UNEXPECTED OPERATION	When re-pull is repeated due to insufficient tension.	

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn power switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT

1. Turn the power switch OFF to ON.
2. Press the parking brake switch.
   CAUTION:
   - **Put the select lever in the P position.**
   - **Depress the brake pedal.**
3. Pull the parking brake switch.
4. Perform self-diagnosis for “EHS/PKB”.

Is DTC “C10E0” detected?

YES (ACTUATOR ACTUATOR SLIPPING)>>Proceed to PB-42, "ACTUATOR SLIPPING : Diagnosis Procedure".
YES (ACTUATOR COMMANDED POS NOT REACH)>>Proceed to PB-44, "COMMANDED POS NOT REACH : Diagnosis Procedure".
YES (ACTUATOR MECHANICAL LINKAGE MALFNCTN)>>Proceed to PB-45, "MECHANICAL LINKAGE MALFNCTN : Diagnosis Procedure".
YES (ACTUATOR PERFORMANCE/INCRRCT OPERAT)>>Proceed to PB-47, "PERFORMANCE/INCRRCT OPERAT : Diagnosis Procedure".
YES (ACTUATOR UNEXPECTED OPERATION)>>Proceed to PB-48, "UNEXPECTED OPERATION : Diagnosis Procedure".
NO >> INSPECTION END

ACTUATOR SLIPPING

ACTUATOR SLIPPING : Diagnosis Procedure

INFOID:0000000006960899

1.CHECK THE CABLE

1. Turn the power switch OFF.
2. Check each cable to see if it is stuck or broken.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace the parking brake actuator or parking brake rear cable.

- Parking brake actuator: Refer to PB-85, "Removal and Installation".
- Parking brake rear cable: PB-87, "Removal and Installation".

2.CHECK PARKING BRAKE ACTUATOR CIRCUIT (1)

1. Disconnect parking brake actuator harness connector.
2. Disconnect electric parking brake control module harness connector.
3. Check continuity between parking brake actuator and electric parking brake control module harness connector.

Parking brake actuator		Electric parking brake control module		Continuity
Connector	Terminal	Connector	Terminal	
B23	2	B21	11	Existed
	3		1	
	4		15	
	7		2	
	8		3	

4. Check continuity between parking brake actuator and ground.

Parking brake actuator		—	Continuity
Connector	Terminal		
B23	2	Ground	Not existed
	3		
	4		
	7		
	8		

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace error-detected parts.

3.CHECK PARKING BRAKE ACTUATOR CIRCUIT (2)

1. Check continuity between parking brake actuator and electric parking brake control module harness connector.

Parking brake actuator		Electric parking brake control module		Continuity
Connector	Terminal	Connector	Terminal	
B23	13	B22	23	Existed
	14		21	

2. Check continuity between parking brake actuator and ground.

Parking brake actuator		—	Continuity
Connector	Terminal		
B23	13	Ground	Not existed
	14		

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

4.PERFORM SELF-DIAGNOSIS RESULTS

With CONSULT
1. Connect parking brake actuator harness connector.
2. Connect electric parking brake control module harness connector.

3. Turn the power switch OFF to ON.
   CAUTION:
   Be sure to perform the operation above.
4. Erase Self-diagnosis result for “EHS/PKB”.
5. Turn the power switch OFF, and wait 10 seconds or more.
6. Turn the power switch ON.
7. Pull parking brake switch to activate electric parking brake.
8. Push parking brake switch to release electric parking brake.
9. Perform self-diagnosis for “EHS/PKB”.

Is any DTC detected?

YES (“C11E0”)>>Replace parking brake actuator. Refer to PB-85, "Removal and Installation".
YES (Except “C11E0”)>>Check the DTC. Refer to PB-29, "DTC Index".
NO >> INSPECTION END

COMMANDED POS NOT REACH

COMMANDED POS NOT REACH : Diagnosis Procedure

INFOID:0000000006960900

1.CHECK THE CABLE

1. Turn the power switch OFF.
2. Check each cable to see if it is stuck or broken.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace the parking brake actuator or parking brake rear cable.
- Parking brake actuator: Refer to PB-85, "Removal and Installation".
- Parking brake rear cable: PB-87, "Removal and Installation".

2.CHECK PARKING BRAKE ACTUATOR CIRCUIT (1)

1. Disconnect parking brake actuator harness connector.
2. Disconnect electric parking brake control module harness connector.
3. Check continuity between parking brake actuator and electric parking brake control module harness connector.

Parking brake actuator		Electric parking brake control module		Continuity
Connector	Terminal	Connector	Terminal	
B23	2	B21	11	Existed
	3		1	
	4		15	
	7		2	
	8		3	

4. Check continuity between parking brake actuator and ground.

Parking brake actuator		—	Continuity
Connector	Terminal		
B23	2	Ground	Not existed
	3		
	4		
	7		
	8		

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace error-detected parts.

3.CHECK PARKING BRAKE ACTUATOR CIRCUIT (2)

1. Check continuity between parking brake actuator and electric parking brake control module harness connector.

Parking brake actuator		Electric parking brake control module		Continuity
Connector	Terminal	Connector	Terminal	
B23	13	B22	23	Existed
	14		21	

2. Check continuity between parking brake actuator and ground.

Parking brake actuator		—	Continuity
Connector	Terminal		
B23	13	Ground	Not existed
	14		

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

4. PERFORM SELF-DIAGNOSIS RESULTS

With CONSULT
1. Connect parking brake actuator harness connector.
2. Connect electric parking brake control module harness connector.
3. Turn the power switch OFF to ON.

CAUTION:
Be sure to perform the operation above.

4. Erase Self-diagnosis result for “EHS/PKB”.
5. Turn the power switch OFF, and wait 10 seconds or more.
6. Turn the power switch ON.
7. Pull parking brake switch to activate electric parking brake.
8. Push parking brake switch to release electric parking brake.
9. Perform self-diagnosis for “EHS/PKB”.

Is any DTC detected?

YES (“C11E0”)>>Replace parking brake actuator. Refer to PB-85, "Removal and Installation".
YES (Except “C11E0”)>>Check the DTC. Refer to PB-29, "DTC Index".
NO >> INSPECTION END

MECHANICAL LINKAGE MALFNCTN

MECHANICAL LINKAGE MALFNCTN : Diagnosis Procedure

INFOID:0000000006960901

1. CHECK THE CABLE

1. Turn the power switch OFF.
2. Check each cable to see if it is stuck or broken.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace the parking brake actuator or parking brake rear cable.
- Parking brake actuator: Refer to PB-85, "Removal and Installation".
- Parking brake rear cable: PB-87, "Removal and Installation".

2. CHECK PARKING BRAKE ACTUATOR CIRCUIT (1)

1. Disconnect parking brake actuator harness connector.
2. Disconnect electric parking brake control module harness connector.
3. Check continuity between parking brake actuator and electric parking brake control module harness connector.

Parking brake actuator		Electric parking brake control module		Continuity
Connector	Terminal	Connector	Terminal	
B23	2	B21	11	Existed
	3		1	
	4		15	
	7		2	
	8		3	

4. Check continuity between parking brake actuator and ground.

Parking brake actuator		—	Continuity
Connector	Terminal		
B23	2	Ground	Not existed
	3		
	4		
	7		
	8		

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace error-detected parts.

3. CHECK PARKING BRAKE ACTUATOR CIRCUIT (2)

1. Check continuity between parking brake actuator and electric parking brake control module harness connector.

Parking brake actuator		Electric parking brake control module		Continuity
Connector	Terminal	Connector	Terminal	
B23	13	B22	23	Existed
	14		21	

2. Check continuity between parking brake actuator and ground.

Parking brake actuator		—	Continuity
Connector	Terminal		
B23	13	Ground	Not existed
	14		

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

4. PERFORM SELF-DIAGNOSIS RESULTS

With CONSULT
1. Connect parking brake actuator harness connector.
2. Connect electric parking brake control module harness connector.
3. Turn the power switch OFF to ON.
   CAUTION:
   Be sure to perform the operation above.
4. Erase Self-diagnosis result for “EHS/PKB”.
5. Turn the power switch OFF, and wait 10 seconds or more.
6. Turn the power switch ON.
7. Pull parking brake switch to activate electric parking brake.
8. Push parking brake switch to release electric parking brake.

9. Perform self-diagnosis for “EHS/PKB”.

Is any DTC detected?

YES (“C11E0”)>>Replace parking brake actuator. Refer to PB-85, "Removal and Installation".
YES (Except “C11E0”)>>Check the DTC. Refer to PB-29, "DTC Index".
NO >> INSPECTION END

PERFORMANCE/INCRRCT OPERAT

PERFORMANCE/INCRRCT OPERAT : Diagnosis Procedure

INFOID:0000000006960902

1.CHECK THE CABLE

1. Turn the power switch OFF.
2. Check each cable to see if it is stuck or broken.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace the parking brake actuator or parking brake rear cable.
- Parking brake actuator: Refer to PB-85, "Removal and Installation".
- Parking brake rear cable: PB-87, "Removal and Installation".

2.CHECK PARKING BRAKE ACTUATOR CIRCUIT (1)

1. Disconnect parking brake actuator harness connector.
2. Disconnect electric parking brake control module harness connector.
3. Check continuity between parking brake actuator and electric parking brake control module harness connector.

Parking brake actuator		Electric parking brake control module		Continuity
Connector	Terminal	Connector	Terminal	
B23	2	B21	11	Existed
	3		1	
	4		15	
	7		2	
	8		3	

4. Check continuity between parking brake actuator and ground.

Parking brake actuator		—	Continuity
Connector	Terminal		
B23	2	Ground	Not existed
	3		
	4		
	7		
	8		

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace error-detected parts.

3.CHECK PARKING BRAKE ACTUATOR CIRCUIT (2)

1. Check continuity between parking brake actuator and electric parking brake control module harness connector.

Parking brake actuator		Electric parking brake control module		Continuity
Connector	Terminal	Connector	Terminal	

B23	13	B22	23	Existed
	14		21	

2. Check continuity between parking brake actuator and ground.

Parking brake actuator		—	Continuity
Connector	Terminal		
B23	13	Ground	Not existed
	14		

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

4.PERFORM SELF-DIAGNOSIS RESULTS

With CONSULT
1. Connect parking brake actuator harness connector.
2. Connect electric parking brake control module harness connector.
3. Turn the power switch OFF to ON.
   CAUTION:
   Be sure to perform the operation above.
4. Erase Self-diagnosis result for “EHS/PKB”.
5. Turn the power switch OFF, and wait 10 seconds or more.
6. Turn the power switch ON.
7. Pull parking brake switch to activate electric parking brake.
8. Push parking brake switch to release electric parking brake.
9. Perform self-diagnosis for “EHS/PKB”.

Is any DTC detected?

YES (“C11E0”)>>Replace parking brake actuator. Refer to PB-85, "Removal and Installation".
YES (Except “C11E0”)>>Check the DTC. Refer to PB-29, "DTC Index".
NO >> INSPECTION END

UNEXPECTED OPERATION

UNEXPECTED OPERATION : Diagnosis Procedure

INFOID:0000000006960903

1.CHECK THE CABLE

1. Turn the power switch OFF.
2. Check each cable to see if it is stuck or broken.

Is the inspection result normal?

YES >> Replace the parking brake actuator or parking brake rear cable.
- Parking brake actuator: Refer to PB-85, "Removal and Installation".
- Parking brake rear cable: PB-87, "Removal and Installation".

NO >> GO TO 2.

2.CHECK PARKING BRAKE ACTUATOR CIRCUIT (1)

1. Disconnect parking brake actuator harness connector.
2. Disconnect electric parking brake control module harness connector.
3. Check continuity between parking brake actuator and electric parking brake control module harness connector.

Parking brake actuator		Electric parking brake control module		Continuity
Connector	Terminal	Connector	Terminal	

B23	2	B21	11	Existed
	3		1	
	4		15	
	7		2	
	8		3	

4. Check continuity between parking brake actuator and ground.

Parking brake actuator		—	Continuity
Connector	Terminal		
B23	2	Ground	Not existed
	3		
	4		
	7		
	8		

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace error-detected parts.

3. CHECK PARKING BRAKE ACTUATOR CIRCUIT (2)

1. Check continuity between parking brake actuator and electric parking brake control module harness connector.

Parking brake actuator		Electric parking brake control module		Continuity
Connector	Terminal	Connector	Terminal	
B23	13	B22	23	Existed
	14		21	

2. Check continuity between parking brake actuator and ground.

Parking brake actuator		—	Continuity
Connector	Terminal		
B23	13	Ground	Not existed
	14		

Is the inspection result normal?

YES >> Replace parking brake actuator. Refer to PB-85, "Removal and Installation".
NO >> Repair or replace error-detected parts.

C10E1 MOTOR CIRCUIT

DTC Logic

INFOID:0000000006960904

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C10E1	CONTROL MODULE	• When an open circuit is detected in the motor. • When a short-circuit is detected in the motor.	• Harness or connector • electric parking brake control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn power switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the power switch OFF to ON.
2. Perform self-diagnosis for “EHS/PKB”.

Is DTC “C10E1” detected?

YES >> Proceed to PB-50, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006960905

1.CHECK MOTOR CIRCUIT (1)

1. Turn the power switch OFF.
2. Disconnect electric parking brake control module harness connector.
3. Disconnect parking brake actuator harness connector.
4. Check continuity between electric parking brake control module harness connector and parking brake actuator harness connector.

Electric parking brake control module		Parking brake actuator		Continuity
Connector	Terminal	Connector	Terminal	
B22	21	B23	14	Existed
	23		13	

5. Check continuity between electric parking brake control module harness connector and ground.

Electric parking brake control module		—	Continuity
Connector	Terminal		
B22	21	Ground	Not existed
	23		

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace error-detected parts.

2.CHECK MOTOR CIRCUIT (2)

Check resistance between parking brake actuator connector terminals.

Parking brake actuator	Resistance
Terminal	
13 – 14	4 Ω or less

Is the inspection result normal?

YES >> Replace electric parking brake control module. Refer to PB-83, "Removal and Installation".
NO >> Replace parking brake actuator. Refer to PB-85, "Removal and Installation".

C10E2 MOTOR

DTC Logic

INFOID:0000000006960906

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C10E2	MOTOR POWER SUPPLY	When the motor power supply voltage is in the following status. • Motor power supply voltage: 11 V ≥ Motor power supply voltage	• Harness or connector • Electric parking brake control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn power switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the power switch OFF to ON.
2. Perform self-diagnosis for “EHS/PKB”.

Is DTC “C10E2” detected?

YES >> Proceed to PB-52, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006960907

1.CHECK MOTOR POWER SUPPLY

1. Turn the power switch OFF.
2. Disconnect electric parking brake control module harness connector.
3. Check voltage between electric parking brake control module harness connector and ground.

Electric parking brake control module		—	Voltage
Connector	Terminal		
B22	22	Ground	11 – 14 V

4. Turn the power switch ON.
   CAUTION:
   Never set the vehicle to READY.
5. Check voltage between electric parking brake control module harness connector and ground.

Electric parking brake control module		—	Voltage
Connector	Terminal		
B22	22	Ground	11 – 14 V

Is the inspection result normal?

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

2.CHECK MOTOR POWER SUPPLY CIRCUIT

1. Turn the power switch OFF.
2. Check 30A fuse (#36).
3. Check continuity and short circuit between electric parking brake control module harness connector terminal (22) and 30A fuse (#36).

Is the inspection result normal?

YES >> Perform trouble diagnosis for 12V battery power supply. Refer to PG-15, "Wiring Diagram - BATTERY POWER SUPPLY -".

NO >> Repair or replace error-detected parts.

3. CHECK MOTOR GROUND CIRCUIT

1. Turn the power switch OFF.
2. Check continuity between electric parking brake control module harness connector and ground.

Electric parking brake control module		—	Continuity
Connector	Terminal		
B22	24	Ground	Existed

Is the inspection result normal?

YES >> Replace electric parking brake control module. Refer to PB-83, "Removal and Installation".

NO >> Repair or replace error-detected parts.

C10E3 PARKING BRAKE SWITCH

DTC Logic

INFOID:0000000006960908

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C10E3	PARKING BRAKE SWITCH	When the signal is not input even when the parking brake switch is operated.	• Harness or connector • Parking brake switch • Electric parking brake control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn power switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the power switch OFF to ON.
2. Press the parking brake switch.
   CAUTION:
   - **Put the select lever in the P position.**
   - **Depress the brake pedal.**
3. Pull the parking brake switch.
4. Perform self-diagnosis for “EHS/PKB”.

Is DTC “C10E3” detected?

YES >> Proceed to PB-54, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006960909

1.CHECK DATA MONITOR

With CONSULT
Select “EHS/PKB”, “DATA MONITOR”, “BRAKE SWITCH” and “RELEASE SWITCH” according to this order. Check that data monitor displays “ON” or “OFF” when parking brake switch is pull or push. Refer to PB-26, "Reference Value".

Is the inspection result normal?

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

2.PERFORM SELF-DIAGNOSIS

With CONSULT
1. Erase Self-diagnosis result for “EHS/PKB”.
2. Repeat the parking brake switch operation (pull and push) 5 times.
3. Perform self-diagnosis for “EHS/PKB”.

Is DTC “C10E3” detected?

YES >> GO TO 3.
NO >> INSPECTION END

3.CHECK PARKING BRAKE SWITCH CIRCUIT

1. Turn the power switch OFF.
2. Disconnect electric parking brake control module harness connector.
3. Disconnect parking brake switch harness connector.

4. Check continuity between electric parking brake control module harness connector and parking brake switch harness connector.

Electric parking brake control module		Parking brake switch		Continuity
Connector	Terminal	Connector	Terminal	
B21	9	B20	1	Existed
	10		7	
	12		8	
	13		2	
B22	18		5	

5. Check continuity between electric parking brake control module harness connector and ground.

Electric parking brake control module		—	Continuity
Connector	Terminal		
B21	9	Ground	Not existed
	10		
	12		
	13		
B22	18		

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

4. CHECK PARKING BRAKE SWITCH

Check parking brake switch. Refer to PB-55, "Component Inspection".

Is the inspection result normal?

YES >> Replace the electric parking brake control module. Refer to PB-83, "Removal and Installation".
NO >> Replace the parking brake switch. Refer to PB-90, "Removal and Installation".

Component Inspection

INFOID:0000000006960910

1. CHECK PARKING BRAKE SWITCH (1)

1. Turn the power switch OFF.
2. Disconnect parking brake switch harness connector.
3. Check continuity when parking brake switch is operated.

Parking brake switch	Condition	Continuity
Terminal		
1 – 3 (Release switch)	When parking brake switch is pull	Existed
	When parking brake switch is push	Not existed
2 – 3 (Brake switch)	When parking brake switch is pull	Not existed
	When parking brake switch is push	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace the parking brake switch. Refer to PB-90, "Removal and Installation".

2. CHECK PARKING BRAKE SWITCH (2)

Check resistance when parking brake switch is operated.

Parking brake switch Terminal	Condition	Resistance
7 – 8 (Analog switch)	When parking brake switch is pull	159 – 176 Ω
	When parking brake switch is push	
	When parking brake is neutral position	2565 – 2835 Ω

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace the parking brake switch. Refer to PB-90, "Removal and Installation".

C10E4 TENSION SENSOR

DTC Logic

INFOID:0000000006960911

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C10E4	TENSION SENSOR	When a tension sensor malfunction is detected.	• Harness or connector • Parking brake actuator

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn power switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT

1. Turn the power switch OFF to ON.
2. Press the parking brake switch.
   CAUTION:
   - **Put the select lever in the P position.**
   - **Depress the brake pedal.**
3. Repeat step 2 to 3 three times
4. Pull the parking brake switch.
5. Perform self-diagnosis for “EHS/PKB”.

Is DTC “C10E4” detected?

YES >> Proceed to PB-57, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006960912

1.CHECK PARKING BRAKE ACTUATOR CIRCUIT

1. Turn the power switch OFF.
2. Disconnect parking brake actuator harness connector.
3. Disconnect electric parking brake control module harness connector.
4. Check continuity between parking brake actuator and electric parking brake control module harness connector.

Parking brake actuator		Electric parking brake control module		Continuity
Connector	Terminal	Connector	Terminal	
B23	2	B21	11	Existed
	3		1	
	4		15	
	7		2	
	8		3	

5. Check continuity between parking brake actuator harness connector and ground.

Parking brake actuator		—	Continuity
Connector	Terminal		

B23	2	Ground	Not existed
	3		
	4		
	7		
	8		

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace error-detected parts.

2.CHECK TENSION SENSOR

1. Connect electric parking brake control module harness connector.
2. Turn the power switch ON.
3. Check voltage between parking brake actuator harness connector terminals.

Parking brake actuator	Voltage
Terminal	
3 – 2	4.75 – 5.25 V
8 – 2	

Is the inspection result normal?

YES >> Replace parking brake actuator. Refer to PB-85, "Removal and Installation".
NO >> Replace electric parking brake control module. Refer to PB-83, "Removal and Installation".

C10E5 ELECTRIC PARKING BRAKE CONTROL MODULE

DTC Logic

INFOID:0000000006960913

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C10E5	POWER SUPPLY VOLTAGE	When power supply voltage is in following status. • Power supply voltage: 10.5 V ≥ Power supply voltage	• Harness or connector • Electric parking brake control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn power switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT

1. Turn the power switch OFF to ON.
2. Perform self-diagnosis for “EHS/PKB”.

Is DTC “C10E5” detected?

YES >> Proceed to PB-59, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006960914

1.CHECK 12V BATTERY

1. Turn the power switch OFF to ON.
2. Check 12V battery. Refer to PG-101, "Work Flow".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace the 12V battery. Refer to PG-104, "Removal and Installation".

2.CHECK ELECTRIC PARKING BRAKE CONTROL MODULE POWER SUPPLY

1. Turn the power switch OFF.
2. Disconnect electric parking brake control module harness connector.
3. Check voltage between electric parking brake control module harness connector and ground.

Electric parking brake control module		—	Voltage
Connector	Terminal		
B21	7	Ground	11 – 14 V

4. Turn the power switch ON.
   CAUTION:
   Never set the vehicle to READY.
5. Check voltage between electric parking brake control module harness connector and ground.

Electric parking brake control module		—	Voltage
Connector	Terminal		
B21	7	Ground	11 – 14 V

Is the inspection result normal?

YES >> GO TO 4.
NO >> GO TO 3.

3.CHECK ELECTRIC PARKING BRAKE CONTROL MODULE POWER SUPPLY CIRCUIT

1. Turn the power switch OFF.
2. Check 10A fuse (#18).
3. Check continuity and short circuit between electric parking brake control module harness connector terminal (7) and 10A fuse (#18).

Is the inspection result normal?

YES >> Perform trouble diagnosis for 12V battery power supply. Refer to PG-15, "Wiring Diagram - BATTERY POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

4.CHECK ELECTRIC PARKING BRAKE CONTROL MODULE GROUND CIRCUIT

1. Turn the power switch OFF.
2. Check continuity between electric parking brake control module harness connector and ground.

Electric parking brake control module		—	Continuity
Connector	Terminal		
B22	24	Ground	Existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace error-detected parts.

C10E6 IGNITION SWITCH

DTC Logic

INFOID:0000000006960915

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C10E6	IGNITION SWITCH	When a malfunction is detected in the power switch system.	• Harness or connector • Electric parking brake control module • Power switch system

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn power switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT

1. Turn the power switch OFF to ON.
2. Perform self-diagnosis for “EHS/PKB”.

Is DTC “C10E6” detected?

YES >> Proceed to PB-61, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006960916

1.CHECK ELECTRIC PARKING BRAKE CONTROL MODULE POWER ON POWER SUPPLY

1. Turn the power switch OFF.
2. Disconnect electric parking brake control module harness connector.
3. Check voltage between electric parking brake control module harness connector and ground.

Electric parking brake control module		—	Voltage
Connector	Terminal		
B21	5	Ground	0 V

4. Turn the power switch ON.
   CAUTION:
   Never set the vehicle to READY.
5. Check voltage between electric parking brake control module harness connector and ground.

Electric parking brake control module		—	Voltage
Connector	Terminal		
B21	5	Ground	11 – 14 V

Is the inspection result normal?

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

2.CHECK ELECTRIC PARKING BRAKE CONTROL MODULE POWER ON POWER SUPPLY CIRCUIT

1. Turn the power switch OFF.
2. Check 10A fuse (#3).
3. Check continuity and short circuit between electric parking brake control module harness connector terminal (5) and 10A fuse (#3).

Is the inspection result normal?

YES >> Perform trouble diagnosis for power ON power supply. Refer to PG-59, "Wiring Diagram - ON POWER SUPPLY -"

NO >> Repair or replace error-detected parts.

3.CHECK DATA MONITOR

With CONSULT

Select “EHS/PKB”, “DATA MONITOR”, “IGNITION SWITCH FROM IPDM” according to this order. Check that data monitor displays when power switch is ON or OFF. Refer to PB-26, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Check the BCM. Refer to BCS-26, "BCM : CONSULT Function (BCM - BCM)".

C10E7 OVER HEAT

DTC Logic

INFOID:0000000006960917

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
C10E7	OVER HEAT	When braking application and release is repeated and the electric parking brake system is hot.	• Electric parking brake control module • Parking brake actuator • Cable

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn power switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the power switch OFF to ON.
2. Press the parking brake switch.
   CAUTION:
   - **Put the select lever in the P position.**
   - **Depress the brake pedal.**
3. Pull the parking brake switch.
4. Perform self-diagnosis for “EHS/PKB”.

Is DTC “C10E7” detected?

YES >> Proceed to PB-63, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006960918

1.PERFORM SELF-DIAGNOSIS (1)

With CONSULT
1. Erase Self-diagnosis result for “EHS/PKB”.
2. Conduct parking brake switch operation (pull and push) after leaving approximately 1 minute.
3. Perform self-diagnosis for “EHS/PKB”.

Is DTC “C10E7” detected?

YES >> Check When parking brake actuator and parking brake rear cable are stuck.
- Parking brake actuator: Refer to PB-86, "Inspection".
- Parking brake rear cable: Refer to PB-88, "Inspection".

NO >> GO TO 2.

2.PERFORM SELF-DIAGNOSIS (2)

With CONSULT
1. Repeat the parking brake switch operation (pull and push) 5 times.
2. Perform self-diagnosis for “EHS/PKB”.

Is DTC “C10E7” detected?

YES >> Replace parking brake actuator. Refer to PB-85, "Removal and Installation".
NO >> INSPECTION END

U0100 VCM COMMUNICATION

Description

INFOID:0000000006960919

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

INFOID:0000000006960920

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
U0100	ECM/PCM A	When CAN communication signal with VCM is not continuously received for 2 seconds or more.	• CAN communication line • Electric parking brake control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn power switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the power switch OFF to ON.
2. Perform self-diagnosis for “EHS/PKB”.

Is DTC “U0100” detected?

YES >> Proceed to PB-64, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006960921

1.PERFORM SELF-DIAGNOSIS

With CONSULT
Perform self-diagnosis for “EV/HEV”. Refer to EVC-51, "CONSULT Function".

Is DTC “U1000” detected?

YES >> Proceed to LAN-15, "Trouble Diagnosis Flow Chart".
NO >> GO TO 2.

2.CHECK CAN COMMUNICATION LINE

Check “EHS/PKB BRANCH LINE CIRCUIT”. Refer to LAN-59, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Replace the electric parking brake control module. Refer to PB-83, "Removal and Installation".
NO >> Repair or replace error- detected parts. Refer to LAN-25, "Precautions for Harness Repair".

U0111 IPDM COMMUNICATION

Description

INFOID:0000000006960922

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

INFOID:0000000006960923

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
U0111	BATTERY ENERGY CONTROL MODULU A	When CAN communication signal with IPDM E/R is not continuously received for 2 seconds or more.	• CAN communication line • Electric parking brake control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn power switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the power switch OFF to ON.
2. Perform self-diagnosis for “EHS/PKB”.

Is DTC “U0111” detected?

YES >> Proceed to PB-65, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006960924

1.PERFORM SELF-DIAGNOSIS

With CONSULT
Perform self-diagnosis for “IPDM E/R”. Refer to PCS-10, "Diagnosis Description".

Is DTC “U1000” detected?

YES >> Proceed to LAN-15, "Trouble Diagnosis Flow Chart".
NO >> GO TO 2.

2.CHECK CAN COMMUNICATION LINE

Check “EHS/PKB BRANCH LINE CIRCUIT”. Refer to LAN-59, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Replace the electric parking brake control module. Refer to PB-83, "Removal and Installation".
NO >> Repair or replace error- detected parts. Refer to LAN-25, "Precautions for Harness Repair".

U0129 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) COMMUNICATION

Description

INFOID:0000000006960925

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

INFOID:0000000006960926

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
U0129	BRAKE SYSTEM CONTROL MODULE	When CAN communication signal with ABS actuator and electric unit (control unit) is not continuously received for 2 seconds or more.	• CAN communication line • Electric parking brake control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn power switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT

1. Turn the power switch OFF to ON.
2. Perform self-diagnosis for “EHS/PKB”.

Is DTC “U0129” detected?

YES >> Proceed to PB-66, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006960927

1.PERFORM SELF-DIAGNOSIS

With CONSULT

Perform self-diagnosis for “ABS”. Refer to BRC-38, "CONSULT Function".

Is DTC “U1000” detected?

YES >> Proceed to LAN-15, "Trouble Diagnosis Flow Chart".
NO >> GO TO 2.

2.CHECK CAN COMMUNICATION LINE

Check “EHS/PKB BRANCH LINE CIRCUIT”. Refer to LAN-59, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Replace the electric parking brake control module. Refer to PB-83, "Removal and Installation".
NO >> Repair or replace error- detected parts. Refer to LAN-25, "Precautions for Harness Repair".

U0140 BCM COMMUNICATION

Description

INFOID:0000000006960928

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

INFOID:0000000006960929

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
U0140	BCM	When CAN communication signal with BCM is not continuously received for 2 seconds or more.	• CAN communication line • Electric parking brake control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn power switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the power switch OFF to ON.
2. Perform self-diagnosis for “EHS/PKB”.

Is DTC “U0140” detected?

YES >> Proceed to PB-67, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006960930

1.PERFORM SELF-DIAGNOSIS

With CONSULT
Perform self-diagnosis for “BCM”. Refer to BCS-13, "COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)".

Is DTC “U1000” detected?

YES >> Proceed to LAN-15, "Trouble Diagnosis Flow Chart".
NO >> GO TO 2.

2.CHECK CAN COMMUNICATION LINE

Check “EHS/PKB BRANCH LINE CIRCUIT”. Refer to LAN-59, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Replace the electric parking brake control module. Refer to PB-83, "Removal and Installation".
NO >> Repair or replace error- detected parts. Refer to LAN-25, "Precautions for Harness Repair".

U0155 METER COMMUNICATION

Description

INFOID:0000000006960931

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

INFOID:0000000006960932

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
U0155	IPC CONTROL MODULE	When CAN communication signal with combination meter is not continuously received for 2 seconds or more.	• CAN communication line • Electric parking brake control module

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn power switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the power switch OFF to ON.
2. Perform self-diagnosis for “EHS/PKB”.

Is DTC “U0155” detected?

YES >> Proceed to PB-68, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006960933

1.PERFORM SELF-DIAGNOSIS

With CONSULT
Perform self-diagnosis for “METER M&A”. Refer to MWI-46, "CONSULT Function".

Is DTC “U1000” detected?

YES >> Proceed to LAN-15, "Trouble Diagnosis Flow Chart".
NO >> GO TO 2.

2.CHECK CAN COMMUNICATION LINE

Check “EHS/PKB BRANCH LINE CIRCUIT”. Refer to LAN-59, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Replace the electric parking brake control module. Refer to PB-83, "Removal and Installation".
NO >> Repair or replace error- detected parts. Refer to LAN-25, "Precautions for Harness Repair".

U0401 VCM SIGNAL

DTC Logic

INFOID:0000000006960935

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
U0401	VCM	When a VCM error is detected.	VCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn power switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the power switch OFF to ON.
2. Perform self-diagnosis for “EHS/PKB”.

Is DTC “U0401” detected?

YES >> Proceed to PB-69, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006960936

1.CHECK DATA MONITOR

With CONSULT
1. Select “EHS/PKB”, “DATA MONITOR” according to this order.
2. Select “ACCELE OPEN ANGLE” and “SHIFT RANGE”, and check that data monitor displays. Refer to PB-26, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Check the VCM. Refer to EVC-51, "CONSULT Function".

U0418 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) SIGNAL

DTC Logic

INFOID:0000000006960938

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
U0418	BRAKE SYSTEM CONTROL MODULE	When an ABS actuator and electric unit (control unit) error is detected.	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn power switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Turn the power switch OFF to ON.
2. Perform self-diagnosis for “EHS/PKB”.

Is DTC “U0418” detected?

YES >> Proceed to PB-70, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006960939

1.CHECK DATA MONITOR

With CONSULT
1. Select “EHS/PKB”, “DATA MONITOR” according to this order.
2. Select “WHEEL SENSOR REAR RH”, “WHEEL SENSOR REAR LH”, “DECEL G SENSOR” and “VEHICLE SPEED”, and check that data monitor displays. Refer to PB-26, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Check the ABS actuator and electric unit (control unit). Refer to BRC-38, "CONSULT Function".

U0422 BCM SIGNAL

DTC Logic

INFOID:0000000006960941

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
U0422	BCM	When a BCM error is detected.	BCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn power switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT

1. Turn the power switch OFF to ON.
2. Perform self-diagnosis for “EHS/PKB”.

Is DTC “U0422” detected?

YES >> Proceed to PB-71, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006960942

1.CHECK DATA MONITOR

With CONSULT

1. Select “EHS/PKB”, “DATA MONITOR” according to this order.
2. Select “BRAKE SWITCH FROM BCM”, and check that data monitor displays. Refer to PB-26, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Check the BCM. Refer to BCS-13, "COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)".

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000006960943

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

INFOID:0000000006960944

DTC DETECTION LOGIC

DTC	Display Item	Malfunction detected condition	Possible causes
U1000	CAN COMM CIRCUIT	When CAN communication signal is not continuously transmitted or received for 2 seconds or more.	CAN communication system malfunction

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” has been previously conducted, always turn power switch OFF and wait at least 10 seconds before conducting the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT

1. Turn the power switch OFF to ON.
2. Perform self-diagnosis for “EHS/PKB”.

Is DTC “C1000” detected?

YES >> Proceed to PB-72, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006960945

Proceed to LAN-15, "Trouble Diagnosis Flow Chart".

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:0000000006960946

1.CHECK ELECTRIC PARKING BRAKE CONTROL MODULE POWER SWITCH ON POWER SUPPLY

1. Turn the power switch OFF.
2. Disconnect electric parking brake control module harness connector.
3. Check voltage between electric parking brake control module harness connector and ground.

Electric parking brake control module		—	Voltage
Connector	Terminal		
B21	5	Ground	Approx. 0 V

4. Turn the power switch ON
   CAUTION:
   Never set the vehicle to READY.
5. Check voltage between electric parking brake control module harness connector and ground.

Electric parking brake control module		—	Voltage
Connector	Terminal		
B21	5	Ground	11 – 14 V

Is the inspection result normal?

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

2.CHECK ELECTRIC PARKING BRAKE CONTROL MODULE POWER SWITCH ON POWER SUPPLY CIRCUIT

1. Turn the power switch OFF.
2. Check 10A fuse (#3).
3. Check continuity and short circuit between electric parking brake control module harness connector terminal (5) and 10A fuse (#3).

Is the inspection result normal?

YES >> Perform trouble diagnosis for power switch ON power supply. Refer to PG-59, "Wiring Diagram - ON POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

3.CHECK MOTOR POWER SUPPLY

1. Turn the power switch OFF.
2. Check voltage between electric parking brake control module harness connector and ground.

Electric parking brake control module		—	Voltage
Connector	Terminal		
B22	22	Ground	11 – 14 V

3. Turn the power switch ON
   CAUTION:
   Never set the vehicle to READY.
4. Check voltage between electric parking brake control module harness connector and ground.

Electric parking brake control module		—	Voltage
Connector	Terminal		
B22	22	Ground	11 – 14 V

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 4.

4. CHECK MOTOR POWER SUPPLY CIRCUIT

1. Turn the power switch OFF.
2. Check 30A fuse (#36).
3. Check continuity and short circuit between electric parking brake control module harness connector terminal (22) and 30A fuse (#36).

Is the inspection result normal?

YES >> Perform trouble diagnosis for 12V battery power supply. Refer to PG-15, "Wiring Diagram - BATTERY POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

5. CHECK ELECTRIC PARKING BRAKE CONTROL MODULE 12V BATTERY POWER SUPPLY

1. Turn the power switch OFF.
2. Check voltage between electric parking brake control module harness connector and ground.

Electric parking brake control module		—	Voltage
Connector	Terminal		
B21	7	Ground	11 – 14 V

3. Turn the power switch ON
   CAUTION:
   Never set the vehicle to READY.
4. Check voltage between electric parking brake control module harness connector and ground.

Electric parking brake control module		—	Voltage
Connector	Terminal		
B21	7	Ground	11 – 14 V

Is the inspection result normal?

YES >> GO TO 7.
NO >> GO TO 6.

6. CHECK ELECTRIC PARKING BRAKE CONTROL MODULE 12V BATTERY POWER SUPPLY CIRCUIT

1. Turn the power switch OFF.
2. Check 10A fuse (#18).
3. Check continuity and short circuit between electric parking brake control module harness connector terminal (7) and 10A fuse (#18).

Is the inspection result normal?

YES >> Perform trouble diagnosis for 12V battery power supply. Refer to PG-15, "Wiring Diagram - BATTERY POWER SUPPLY -".
NO >> Repair or replace error-detected parts.

7. CHECK ELECTRIC PARKING BRAKE CONTROL MODULE GROUND CIRCUIT

Check for continuity between electric parking brake control module harness connector and the ground.

Electric parking brake control module		—	Continuity
Connector	Terminal		
B22	24	Ground	Existed

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair or replace error-detected parts.

8. CHECK TERMINAL

Check electric parking brake control module pin terminals for damage or loose connection with harness connector.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace error-detected parts.

ELECTRIC PARKING BRAKE INDICATION LAMP

Component Function Check

INFOID:0000000006960947

1.CHECK ELECTRIC PARKING BRAKE INDICATOR LAMP FUNCTION

Check that electric parking brake indicator lamp in combination meter turns ON/OFF when parking brake is operated.

NOTE:

Electric parking brake indicator lamp turns ON when parking brake is operated (when parking brake switch is pull).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to PB-76, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006960948

1.CHECK ELECTRIC PARKING BRAKE CONTROL MODULE POWER SUPPLY AND GROUND CIRCUIT

Perform the trouble diagnosis for electric parking brake control module power supply and ground circuit. Refer to PB-73, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.PERFORM THE SELF-DIAGNOSIS

With CONSULT

1. Perform self-diagnosis for “EHS/PKB”.

Is any DTC detected?

YES >> Check the DTC. Refer to PB-29, "DTC Index".

NO >> GO TO 3.

3.CHECK COMBINATION METER

Check combination meter. Refer to MWI-46, "CONSULT Function".

Is the inspection result normal?

YES >> Replace electric parking brake control module. Refer to PB-83, "Removal and Installation".

NO >> Repair or replace combination meter. Refer to MWI-89, "Removal and Installation".

SYMPTOM DIAGNOSIS

PARKING BRAKE DOES NOT RELEASE

Description

INFOID:0000000006960949

When the parking brake cannot be released by the parking brake switch.

Diagnosis Procedure

INFOID:0000000006960950

1.PERFORM THE SELF-DIAGNOSIS

With CONSULT
Perform self-diagnosis for “EHS/PKB”.

Is any DTC detected?

YES >> Check the DTC. Refer to PB-29, "DTC Index".
NO >> GO TO 2.

2.CHECK THE CABLE

Check each cable to see if it is stuck.

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace error-detected parts.

3.CHECK PARKING BRAKE DRAG

Check if the parking brake is dragging. PB-82, "Adjustment".

Is the parking brake dragging?

YES >> GO TO 4.
NO >> Replace the parking brake actuator. Refer to PB-85, "Removal and Installation".

4.CHECK PARKING BRAKE SHOE INSTALLATION STATUS

Check the parking brake shoe installation status.

Is the inspection result normal?

YES >> Replace the parking brake actuator. Refer to PB-85, "Removal and Installation".
NO >> Repair or replace error-detected parts.

PARKING BRAKE DOES NOT OPERATE

Description

INFOID:0000000006960951

The parking brake is not applied even when the parking brake switch is pulled.

Diagnosis Procedure

INFOID:0000000006960952

1.PERFORM THE SELF-DIAGNOSIS

With CONSULT
Perform self-diagnosis for “EHS/PKB”.

Is any DTC detected?

YES >> Check the DTC. Refer to PB-29, "DTC Index".
NO >> GO TO 2.

2.CHECK THE CABLE

Check each cable to see if it is broken or installed incorrectly.

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace error-detected parts.

3.CHECK PARKING BRAKE SHOE INSTALLATION STATUS

Check installation and wear conditions of parking brake shoe.

Is the inspection result normal?

YES >> Replace the parking brake actuator. Refer to PB-85, "Removal and Installation".
NO >> Repair or replace error-detected parts.

THE BRAKING FORCE OF PARKING BRAKE IS LOW

Description

INFOID:0000000006960953

The parking brake braking force is low and the vehicle moves backward when parked on an incline.

Diagnosis Procedure

INFOID:0000000006960954

1.REAPPLY THE PARKING BRAKE (1)

Pull the parking brake switch again.

Is the vehicle moving backward?

YES >> GO TO 2.
NO >> NORMAL

2.PERFORM THE SELF-DIAGNOSIS

With CONSULT
Perform self-diagnosis for “EHS/PKB”.

Is any DTC detected?

YES >> Check the DTC. Refer to PB-29, "DTC Index".
NO >> GO TO 3.

3.CHECK PARKING BRAKE SHOE INSTALLATION STATUS

Check installation and wear conditions of parking brake shoe.

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

4.REPLACE PARKING BRAKE ACTUATOR

1. Replace the parking brake actuator. Refer to PB-85, "Removal and Installation".
2. Apply the parking brake.

Is the vehicle moving backward?

YES >> GO TO 5.
NO >> NORMAL

5.REAPPLY THE PARKING BRAKE (2)

Pull the parking brake switch again.

Is the vehicle moving backward?

YES >> Replace electric parking brake control module. Refer to PB-83, "Removal and Installation".
NO >> NORMAL

THE BRAKING FORCE OF PARKING BRAKE IS HIGH

Description

INFOID:0000000006960955

The parking brake breaking force is too high.

Diagnosis Procedure

INFOID:0000000006960956

1.PERFORM THE SELF-DIAGNOSIS

With CONSULT
Perform self-diagnosis for “EHS/PKB”.

Is any DTC detected?

YES >> Check the DTC. Refer to PB-29, "DTC Index".
NO >> GO TO 2.

2.CHECK THE CABLE

Check each cable to see if it is stuck.

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace error-detected parts.

3.CHECK PARKING BRAKE DRAG

Check if the parking brake is dragging. PB-82, "Adjustment".

Is the parking brake dragging?

YES >> GO TO 4.
NO >> Replace the parking brake actuator. Refer to PB-85, "Removal and Installation".

4.CHECK PARKING BRAKE SHOE INSTALLATION STATUS

Check the parking brake shoe installation status.

Is the inspection result normal?

YES >> Replace the parking brake actuator. Refer to PB-85, "Removal and Installation".
NO >> Repair or replace error-detected parts.

PERIODIC MAINTENANCE

PARKING BRAKE SYSTEM

Inspection and Adjustment

INFOID:0000000006960957

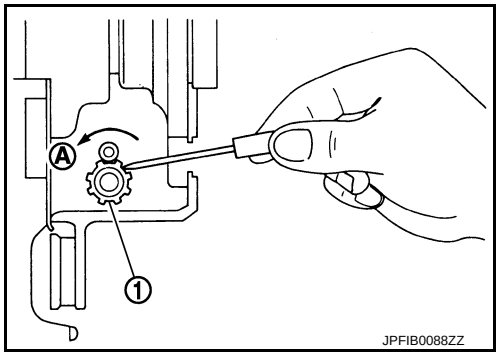
INSPECTION

Inspect Components

- Check each component for installation condition such as looseness.
- Check the cables and parking brake actuator for wear, damage and cracks. Replace if necessary.

ADJUSTMENT

1. Adjust the adjust nut. Refer to PB-87, "Removal and Installation".
2. Remove rear tires with power tool.
3. Fix the disc rotor using wheel nut.
4. Remove the adjusting hole plug from the disc rotor. Turn the adjuster (1) in the direction (A) as shown in the figure using a suitable tool until the disc rotor is locked.
5. Turn back the adjuster 7 notches from the locked position.
6. Rotate the disc rotor to check that there is no drag. Install the adjuster hole plug. Refer to PB-93, "Inspection and Adjustment".
7. Perform parking brake actuator 0 point learning. Refer to PB-38, "Work Procedure".



PARKING BRAKE SHOE

Adjustment

INFOID:0000000006960958

1. Set the vehicle to READY.
2. Drive the vehicle at approx. 40 km/h (25 MPH).
3. Pull the parking brake switch, and stop the vehicle
4. Release the parking brake switch.
5. Release the parking brake.
6. Repeat step 2 to 5 two times.
7. Check the braking force.
8. Release the parking brake.

CAUTION:

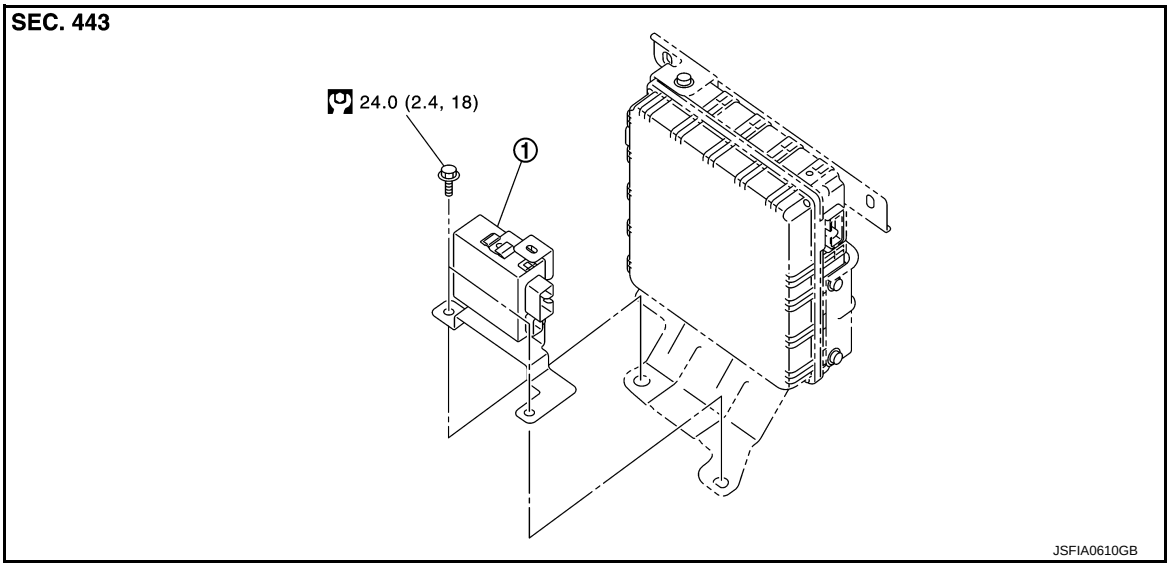
- **The parking brake cannot be released unless the brake pedal is depressed and the parking brake switch is pressed.**
- **There is a danger the tire locks when using the brake tester, so perform release operation quickly.**

REMOVAL AND INSTALLATION

ELECTRIC PARKING BRAKE CONTROL MODULE

Exploded View

INFOID:0000000006960959



1. Electric parking brake control module
2. Electric parking brake control module bracket

: N·m (kg-m, ft-lb)

Removal and Installation

INFOID:0000000006960960

REMOVAL

1. Turn the power switch ON.
   CAUTION:
   Never set the vehicle to READY.
2. Release the parking brake.
   CAUTION:
   If the brake cannot be released, release it manually. Refer to PB-9, "Parking Brake Actuator".
3. Turn the power switch OFF.
4. Disconnect 12V battery negative terminal. Refer to PG-104, "Removal and Installation".
5. Remove the luggage floor front finisher. Refer to INT-34, "LUGGAGE FLOOR FRONT FINISHER : Removal and Installation".
6. Disconnect electric parking brake control module harness connector.
7. Remove electric parking brake control module.
   CAUTION:
   To prevent damage to the parts, never drop removed parts.

INSTALLATION

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

- Perform inspection after installation. Refer to PB-83, "Inspection".

Inspection

INFOID:0000000006960961

INSPECTION AFTER INSTALLATION

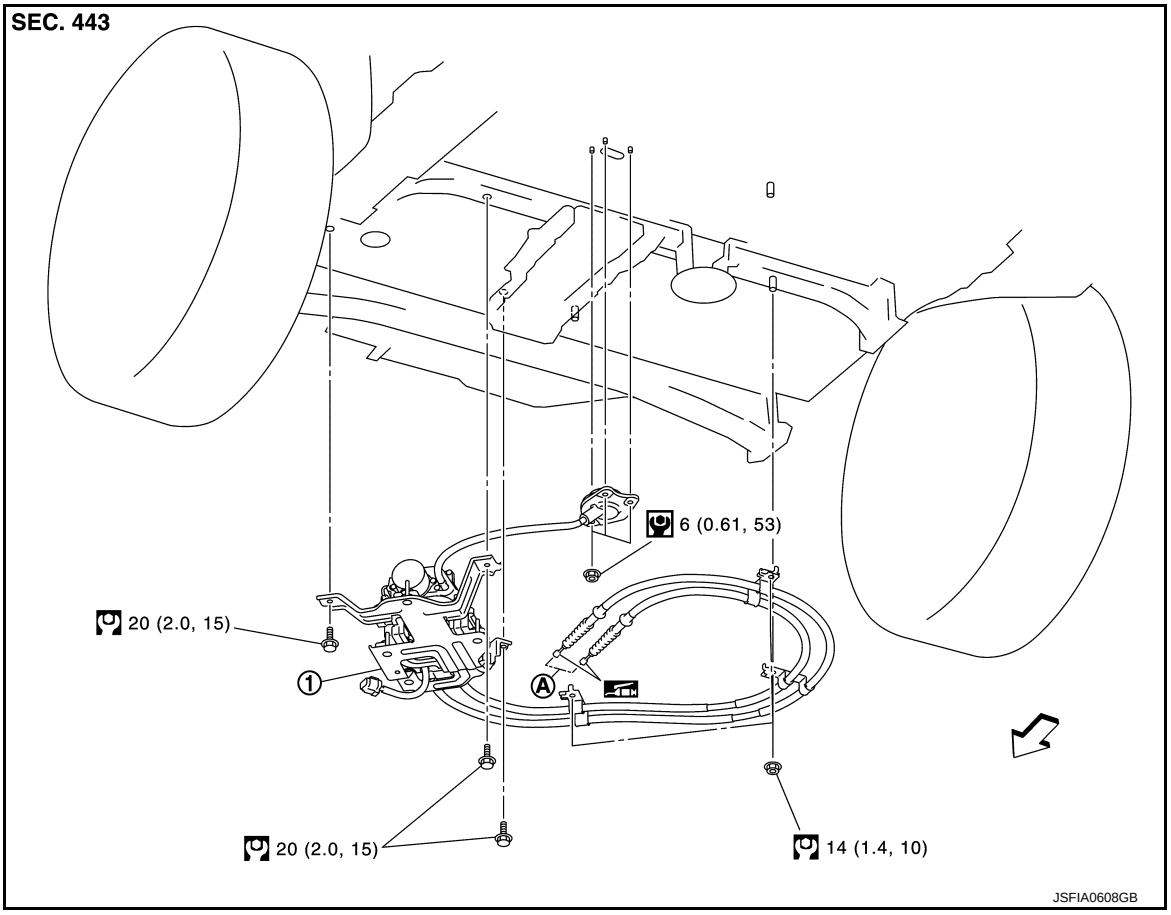
1. Turn the power switch ON.
   CAUTION:
   Never set the vehicle to READY.

2. Pull the parking brake switch.
3. Confirm that the electric parking brake indicator in combination meter turns ON.
4. Push parking brake switch to release electric parking brake.
5. Confirm that the electric parking brake indicator in combination meter turns OFF.

PARKING BRAKE ACTUATOR

Exploded View

INFOID:0000000006960962



1. Parking brake actuator
A. To rear cable

⇦: Vehicle front

: Apply multi-purpose grease.

: N·m (kg-m, ft-lb)

: N·m (kg-m, in-lb)

Removal and Installation

INFOID:0000000006960963

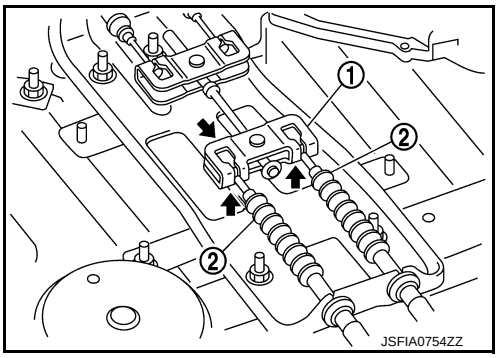
REMOVAL

1. Turn the power switch ON.
   CAUTION:
   Never set the vehicle to READY.
2. Release the parking brake.
   CAUTION:
   If the brake cannot be released, release it manually. Refer to PB-9, "Parking Brake Actuator".
3. Turn the power switch OFF.
4. Disconnect 12V battery negative terminal. Refer to PG-104, "Removal and Installation".
5. Remove rear diffuser. Refer to EXT-22, "REAR DIFFUSER : Removal and Installation".
6. Disconnect parking brake actuator harness connector.
7. Remove cable of parking brake actuator mounting nut from vehicle.

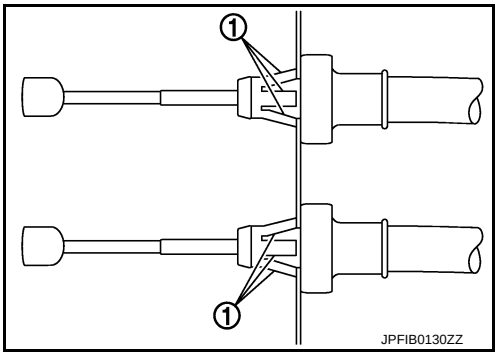
8. Loosen adjust nut. Refer to PB-87, "Removal and Installation".
9. Remove cable of parking brake actuator with the following procedure.

a. Pull equalizer (1) in rearward direction.

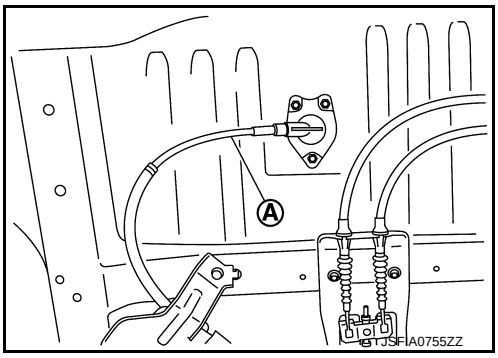
b. Pull cable (2) of parking brake actuator downward to remove cable of parking brake actuator from equalizer.



c. Press the paw (1) to remove cable of parking brake actuator from bracket.



10. Remove emergency release cable (A) of parking brake actuator from vehicle.
11. Remove parking brake actuator from vehicle.
    CAUTION:
    To prevent damage to the parts, never drop remove parts.



INSTALLATION

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

- Perform parking brake actuator 0 point learning when electric parking brake control module is removed and installed, or replaced. Refer to PB-38, "Work Procedure".
- Perform adjustment after installation. Refer to PB-86, "Inspection".

Inspection

INFOID:0000000006960964

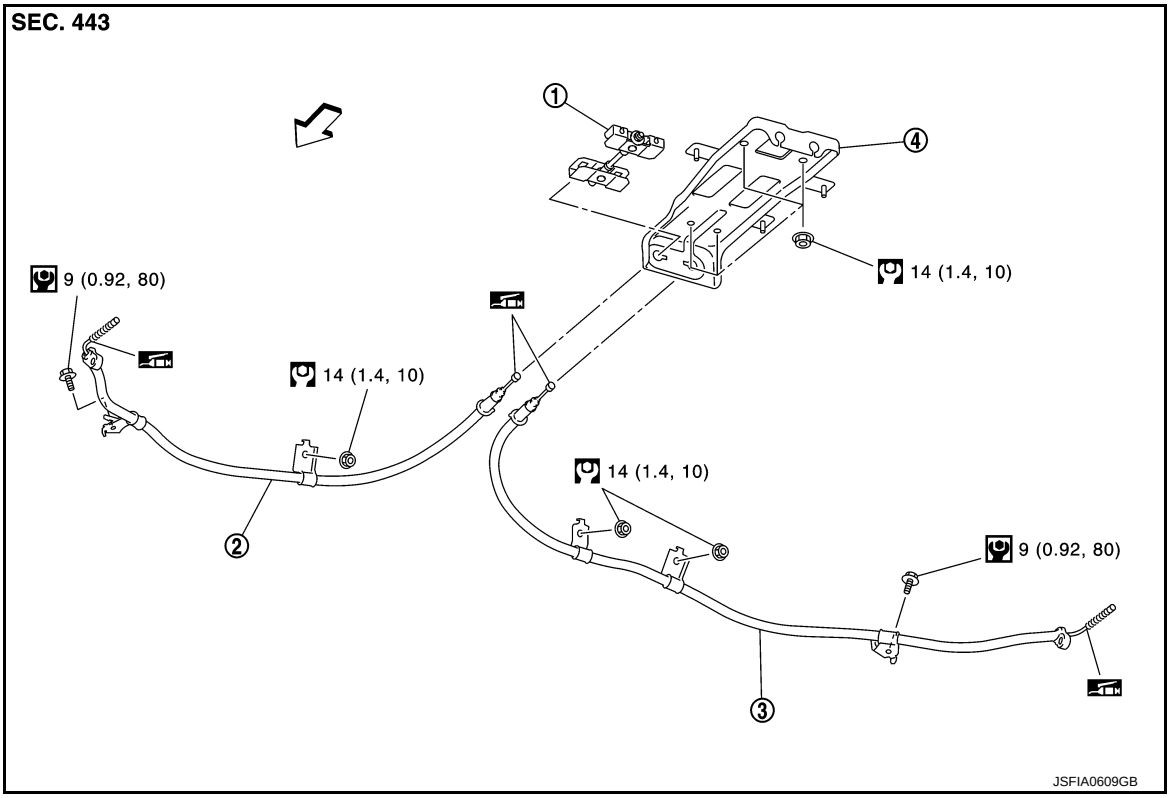
ADJUSTMENT AFTER INSTALLATION

1. Pull the parking brake switch 2 times and check that the electric parking brake indicator in combination meter turns ON.
2. Turn the power switch OFF and wait 20 minutes.
3. Turn the power switch ON.
   CAUTION:
   Never set the vehicle to READY.
4. Check that the electric parking brake indicator in combination meter turns ON.
5. Push parking brake switch to release electric parking brake.
6. Check that the electric parking brake indicator in combination meter turns OFF.

PARKING BRAKE REAR CABLE

Exploded View

INFOID:0000000006960965



1. Equalizer
2. Rear cable (RH)
3. Rear cable (LH)
4. Bracket

: Vehicle front

: Apply multi-purpose grease.

: N·m (kg-m, ft-lb)

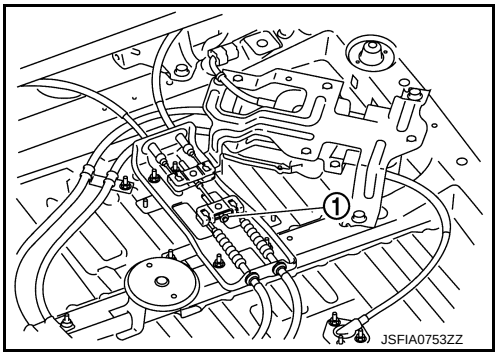
Removal and Installation

INFOID:0000000006960966

REMOVAL

1. Turn the power switch ON.
   CAUTION:
   Never set the vehicle to READY.
2. Release the parking brake.
   CAUTION:
   If the brake cannot be released, release it manually. Refer to PB-9, "Parking Brake Actuator".
3. Turn the power switch OFF.
4. Disconnect 12V battery negative terminal. Refer to PG-104, "Removal and Installation".

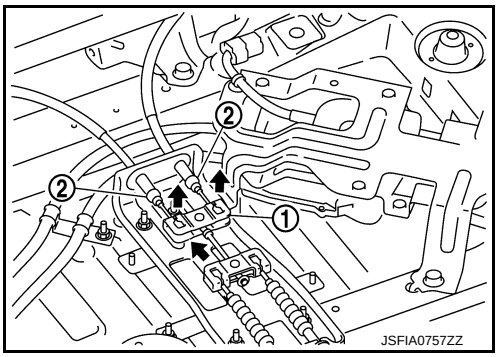
5. Loosen adjust nut (1).



6. Remove rear cable with the following procedure.

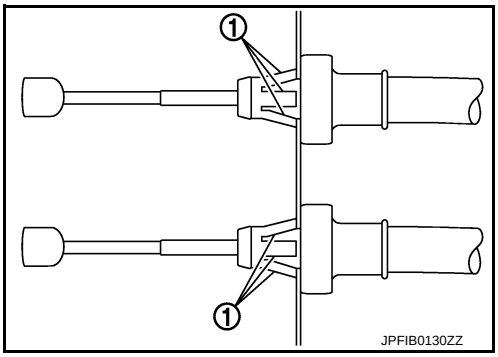
a. Pull equalizer (1) in forward direction.

b. Pull rear cable (2) downward to remove rear cable from equalizer.



c. Press the paw (1) to remove cable from bracket.

d. Remove bracket from vehicle.



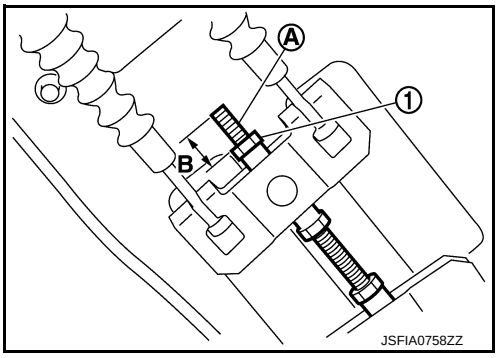
INSTALLATION

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

- Tighten the adjust nut (1) so that the bolt (A) is within dimension B.

B : 13 – 15 mm (0.51 – 0.59 in)

- Perform parking brake actuator 0 point learning when parking brake actuator, parking brake rear cables and parking brake shoe are removed and installed, or replaced. Refer to PB-38, "Work Procedure".
- Perform adjustment after installation. Refer to PB-88, "Inspection".



Inspection

INFOID:0000000006960967

ADJUSTMENT AFTER INSTALLATION

1. Pull the parking brake switch 2 times and confirm the electric parking brake indicator in combination meter turns ON.
2. Turn the power switch OFF and wait 20 minutes.
3. Turn the power switch ON.

CAUTION:
Never set the vehicle to READY.

4. Check that the electric parking brake indicator in combination meter turns ON.
5. Push parking brake switch to release electric parking brake.
6. Check that the electric parking brake indicator in combination meter turns OFF.

PARKING BRAKE SWITCH

Removal and Installation

INFOID:0000000006960968

REMOVAL

1. Remove the console finisher assembly. Refer to IP-23, "Removal and Installation".
2. Remove parking brake switch.

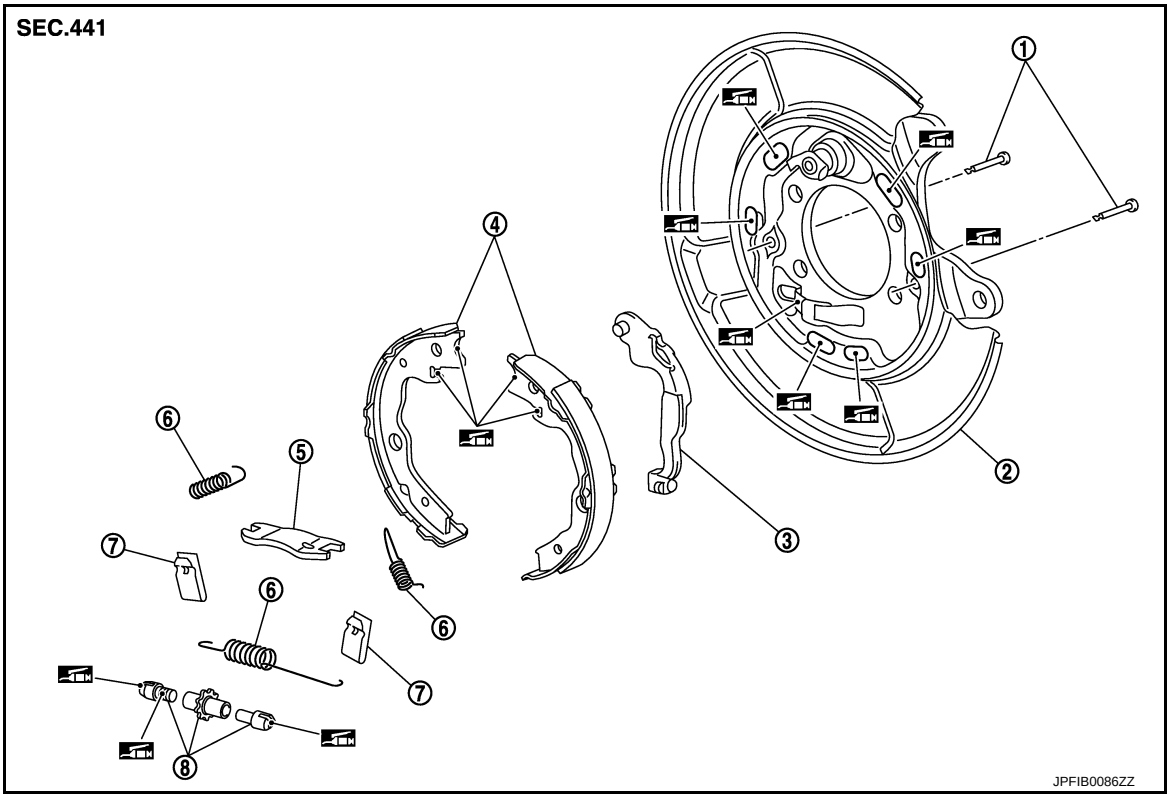
INSTALLATION

Install in the reverse order of removal.

PARKING BRAKE SHOE

Exploded View

INFOID:0000000006960969



1. Anti-rattle pin
2. Back plate
3. Toggle lever
4. Parking brake shoe
5. Brake strut
6. Return spring
7. Spring
8. Adjuster

: Apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease.

Removal and Installation

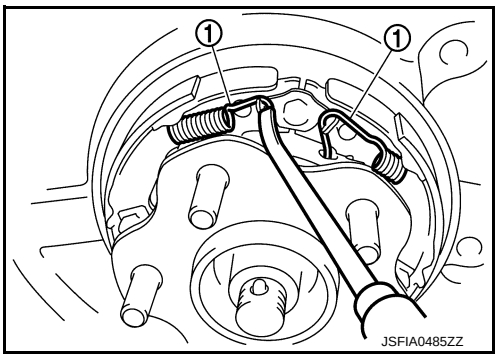
INFOID:0000000006960970

REMOVAL

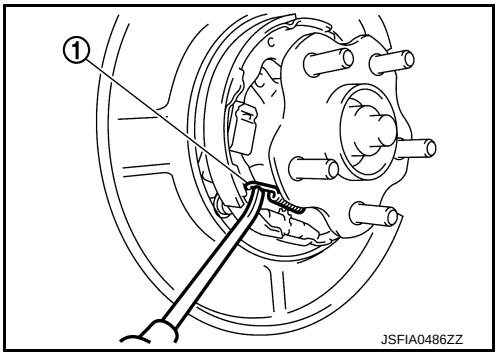
WARNING:

Since dust covering the parking brake shoes has an affect on human body, the dust must be removed with a dust collector. Never splatter the dust with an air blow gun.

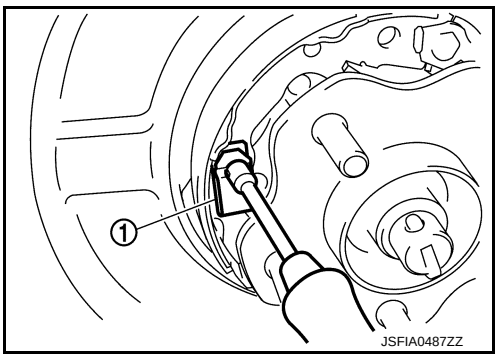
1. Remove rear tires with power tool.
2. Remove disc rotor. Refer to RAX-6, "Removal and Installation".
   CAUTION:
   Parking brake completely in the released position.
3. Remove return spring (1) of the upper side.



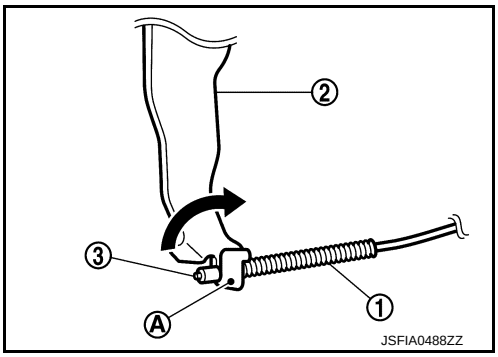
4. Remove return spring (1) of the lower side.



5. Remove spring (1) and anti-rattle pin.
   CAUTION:
   To prevent damage to the parts, never drop the removed parts.
6. Remove parking brake shoes, adjuster, brake strut and toggle lever.
   CAUTION:
   - **The parking brake shoes for the front wheels are made of different materials from those for the rear wheels. Never misidentify them when removing.**
   - **To prevent damage to the parts, never drop the removed parts.**



7. Press the rear cable spring (1) against spring tension to remove rear cable (3) from the clamp (A) of toggle lever (2).
   CAUTION:
   To prevent damage to the parts, never bend rear cable.
8. For the removal of back plate. Refer to RAX-6, "Removal and Installation".

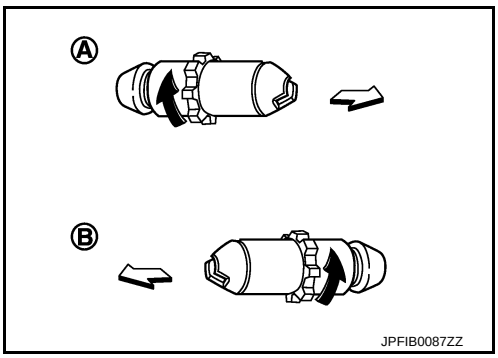


INSTALLATION

Note the following, install in the reverse order of removal.

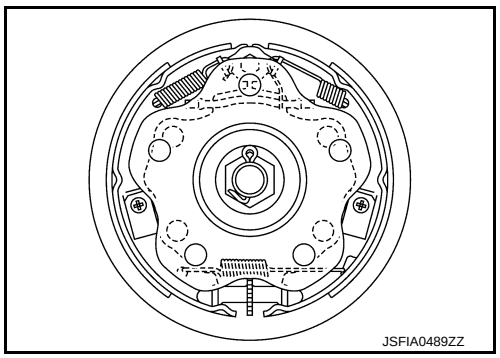
- Apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease to the back plate and brake shoe.
  CAUTION:
  The parking brake shoes for the front wheels are made of different materials from those for the rear wheels. Never misidentify them when removing and replacing.
- Assemble adjusters so that threaded part is expanded when rotating it in the direction shown by arrow.

  A : For right side brake
  B : For left side brake
  ⇦: Vehicle front
  ⬅: Adjuster expands



- Shorten adjuster by rotating it.
- When disassembling apply PBC (Poly Butyl Cuprysil) grease or silicone-based grease to threads.

- Check that the component parts of the parking brake shoe are properly installed.
- Check brake shoe sliding surface and drum inner surface for grease. Wipe it off if it adhere on the surfaces.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Inspection and Adjustment

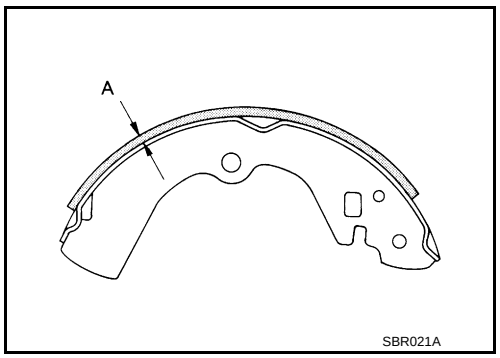
INFOID:0000000006960971

INSPECTION AFTER REMOVAL

Lining Thickness Inspection

- Check thickness (A) of lining.

A : Refer to PB-95, "Parking Drum Brake".

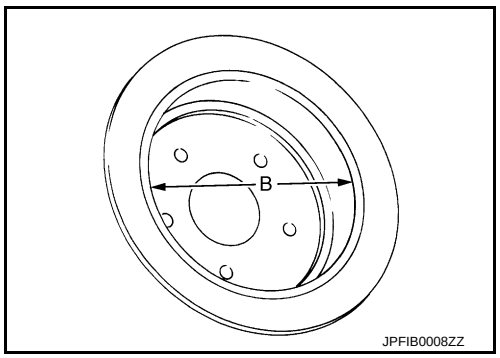


SBR021A

Drum Inner Diameter Inspection

- Check inner diameter (B) of drum.

B : Refer to PB-95, "Parking Drum Brake".



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Other Inspections

Check the following items, and replace the parts if necessary.

- Lining for excessive wear, damage, and peeling.
- Brake shoe sliding surface for excessive wear and damage.
- Anti-rattle pin for excessive wear, damage and rust.
- Return spring and spring for settling, excessive wear, damage, and rust.
- Adjuster for smoothness.
- Toggle lever and brake strut for excessive wear, damage and rust.
- Visually check inside of the drum for excessive wear, cracks, and damage with a pair of vernier calipers.

ADJUSTMENT AFTER INSTALLATION

1. Rotate the disc rotor to check that there is no drag. Install the plug. If any drag is found, follow the procedure described below.

a. Adjust parking brake stroke again.

b. Check rear disc brake. Refer to BR-239, "BRAKE CALIPER ASSEMBLY : Inspection".

2. Adjust the parking brake shoe. Refer to PB-82, "Adjustment".
3. Perform parking brake actuator 0 point learning. Refer to PB-38, "Work Procedure".

4. Pull the parking brake switch and confirm the electric parking brake indicator in combination meter turns ON.
5. Push parking brake switch to release electric parking brake.
6. Check that the electric parking brake indicator in combination meter turns OFF.

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Parking Drum Brake

INFOID:0000000006960972

Unit: mm (in.)

Item	Limit
Brake lining	1.5 (0.059)
Drum (disc of inner diameter)	173 (6.81)