

ELECTRONIC PARKING BRAKE SYSTEM

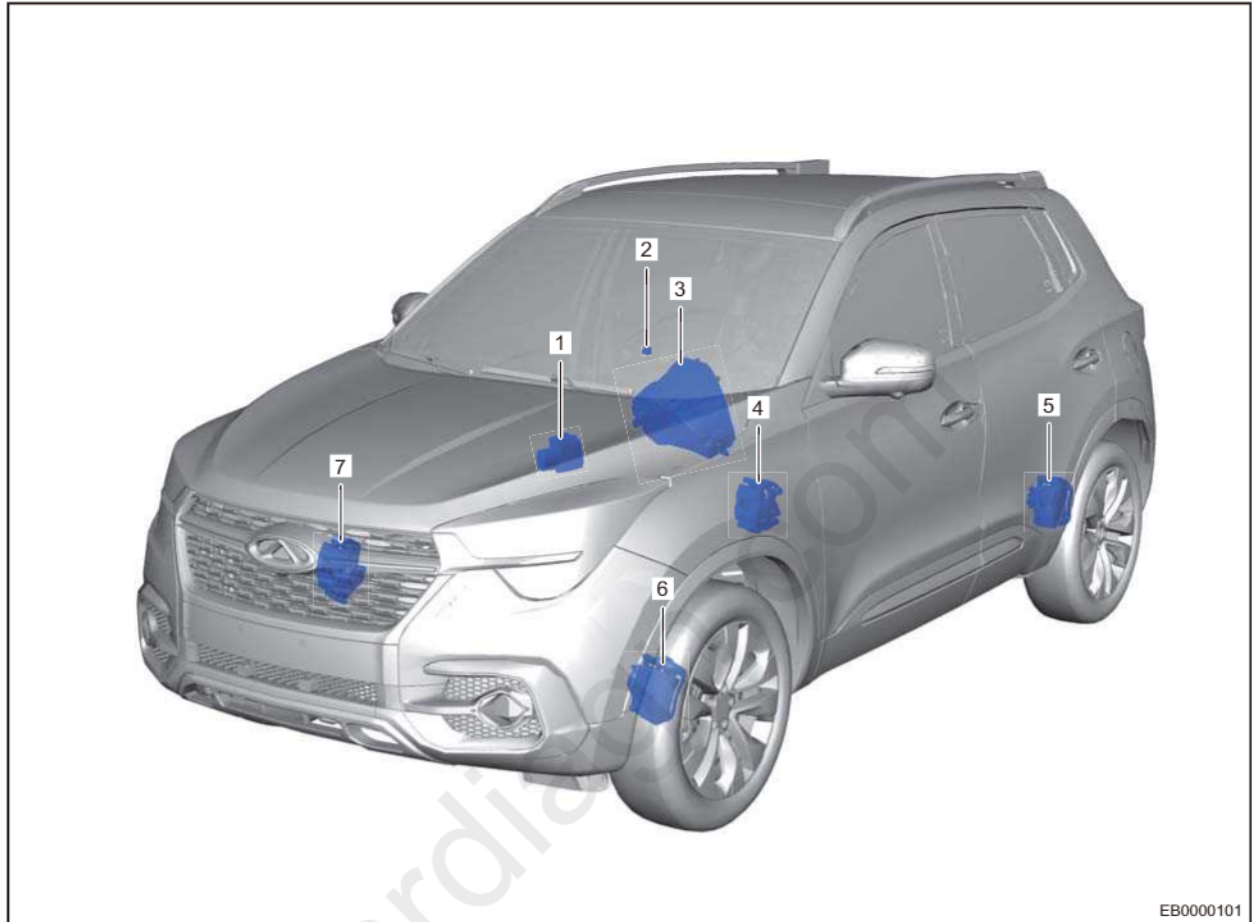
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GENERAL INFORMATION

Overview

Description



EB0000101

1 - ESP Control Module	2 - EPB Button Assembly
3 - Meter	4 - Rear Right Integrated Caliper Assembly
5 - Rear Left Integrated Caliper Assembly	6 - Front Left Brake Caliper Assembly
7 - Front Right Brake Caliper Assembly	

Function Description

EPB (Electrical Parking Brake) system: electrical parking brake system can apply parking brake and emergency brake by electronic control, and traditional handbrake operation is replaced by electronic parking button.

Automatic parking function: After automatic parking function is started, stop vehicle by service brake, release brake pedal to park automatically.

System Function Introduction

I: Manual Parking Function

Function	Vehicle Status	Engine Status	Key Status	EPB Status	Operation Method	HMI Status	
						Instrument Cluster	Switch
Manual Parking	Stationary	Ignited	ON	Stall	Pull up EPB switch	Red P light comes on (goes off 20 seconds after engine stalled)	EPB switch indicator comes on (goes off 20 seconds after engine stalled)
		Stall	ON				

II: Manual Releasing Function

Function	Vehicle Status	Engine Status	Key Status	EPB Status	Operation Method	HMI Status	
						Instrument Cluster	Switch
Manual Releasing Function	Stationary	Ignited/Stall	ON	Firmly applied	Depress brake pedal and press EPB switch simultaneously	Red P light goes off	EPB switch indicator goes off
					Depress accelerator pedal and press EPB switch simultaneously		

III: Stall and Park

With vehicle in stationary status, turn off engine with key or turn key to OFF from ON position, EPB system will park automatically.

For vehicles with start and stop function, when engine stalls with start and stop function operating, parking state of vehicle will not change.

Automatic parking also operates at stall when starting off.

Function	Vehicle Status	Engine Status	Key Status	EPB Status	Operation Method	HMI Status	
						Instrument Cluster	Switch
Stall and Park	Stationary	Ignited → Stall	ON	Released	Turn ENGINE START STOP switch to OFF	Red P light comes on (goes off 20 seconds after engine stalled)	EPB switch indicator comes on (goes off 20 seconds after engine stalled)
		Stall					

IV: EPB Automatic Releasing

Function	Vehicle Status	Engine Status	Key Status	EPB Status	Driver Door Status	Gear Position	Operation Method	HMI Status	
								Instrument Cluster	Switch
EPB Automatic Releasing	Stationary	Ignited	ON	Firmly applied	Closed	Driving or reverse position	Accelerator pedal depressed	Red P light goes off	EPB switch indicator goes off

V: Automatic Parking Function ON

1. This function is four wheels parking brake supplied by ESP system.
2. After automatic parking, when any of following conditions is met, automatic parking will exit and turn to electrical caliper parking, parking light will turn to red P from green P, and a "fizz" sound of electrical caliper will be heard and it is normal operating sound; if there is a malfunction in system, yellow P comes on simultaneously.
 - a. Automatic parking is more than 10 minutes.
 - b. Turn automatic parking function off manually.
 - c. Open the driver door.
 - d. ESP system is malfunctioning.
 - e. Engine stalls.
3. Operation methods for automatic parking and automatic releasing are as shown in table below.

Function	Vehicle Status	Engine Status	Driver Door Status	Operation Method	HMI Status	
					Instrument Cluster	Switch
Automatic Parking Function ON	Stationary	Ignited	Closed	Press automatic parking switch	/	Automatic parking switch indicator comes on

VI: Automatic Parking

Function	Vehicle Status	Engine Status	EPB Status	Driver Door Status	Operation Method	HMI Status	
						Instrument Cluster	Switch
Automatic Parking	Stationary	Ignited	Released	Closed	Depress brake pedal	Green P light comes on	Automatic parking switch indicator comes on
	Driving → Stationary						

VII: Automatic Releasing

Function	Vehicle Status	Engine Status	Automatic Parking Status	Driver Door Status	Operation Method	HMI Status	
						Instrument Cluster	Switch
Automatic Releasing	Driving → Stationary	Ignited	Firmly applied	Closed	Depress accelerator pedal	Green P light goes off	Automatic parking switch indicator comes on

VIII: Reclamping Function

1. If system enters parking status after keeping brake disc at excessively high temperature for a long time (under conditions such as service brake or down-hill HDC ON), electric parking system will perform second clamping according to the brake disc temperature for safety; during the second clamping process, system will produce a certain operating sound, which is normal.
2. If vehicle coasts after stopping (within 10 minutes), for safety, system will increase parking brake force automatically, to make vehicle stationary; during the process of increasing parking brake force, system will produce a certain operating sound, which is normal.
3. Functions of reclamping at coasting and reclamping at high temperature are performed automatically by system without any operation.

Function	Vehicle Status	Engine Status	Key Status	EPB Status	HMI Status	
					Instrument Cluster	Switch
Reclamping at Coasting	Stationary	Ignited/Stall	ON or OFF (within 10 minutes)	Reclamping	No P light comes on	No indicator comes on
Reclamping at High Temperature						



27—ELECTRONIC PARKING BRAKE SYSTEM

IX: Trailer Mode

1. EPB caliper will not clamp automatically after stalling in trailer mode for towing vehicle.
2. Operation method for entering trailer mode is as shown in table below.

Function	Vehicle Status	Engine Status	Key Status	EPB Status	Operation Method	HMI Status	
						Instrument Cluster	Switch
Trailer Mode	Stationary	Ignited/Stall	ON	Released	Turn off engine while keeping EPB switch pressed	No P light comes on	No indicator comes on

X: Roller Mode

1. This mode is used in brake detection during annual inspection of vehicle. EPB system will enter roller mode automatically only when following conditions are met without performing other operations, and there is no any indication on instrument cluster.
2. Operation method for entering roller mode is as shown in table below.

Function	Vehicle Status	Engine Status	Key Status	Operation Method	HMI Status	
					Instrument Cluster	Switch
Roller Mode	Driving	Ignited	ON	Front wheel speed is 0.36 km/h or less; rear wheel speed is 1.8-18 km/h; difference between two wheels speed is 1.8 km/h or less	Yellow P light flashes	No indicator comes on

XI: Service Mode

1. This mode is used when checking and repairing EPB system.
2. When entering service mode, EPB caliper will be released in place automatically.
3. Never perform "Exit Maintenance Mode" if inspection and repair of vehicle are not finished, to prevent serious accident.
4. Diagnostic tester must be used to perform "Exit Maintenance Mode" after inspection and repair of vehicle are finished (such as replacing brake linings with new ones), failure to do so may cause vehicle to lose EPB function, however, conventional braking will not be affected.
5. When service mode function is triggered, a "drone" sound will be heard, it is normal.
6. Operation methods for entering and exiting service mode are as shown in table below.

Function	Vehicle Status	Engine Status	Key Status	Operation Method	HMI Status	
					Instrument Cluster	Switch
Service Mode	Stationary	Ignited/Stall	ON	Entering or exiting is performed using diagnostic tester or by professional technicians at 4S shop	Red P and yellow P lights flash when entering service mode, and reflect EPB status of real-vehicle after exiting service mode	/

XII: Emergency Brake

1. This function is used when service brake becomes unavailable. Never use electric parking brake on this vehicle in emergency case other than service brake failure.
2. Emergency brake refers to the ESP system brake, and the brake force is constant during emergency brake.
3. Brake light comes on normally during emergency brake.
4. When emergency brake function is triggered, a "drone" sound will be heard, it is normal.
5. Operation methods for entering and exiting emergency brake are as shown in table below.

Function	Vehicle Status	Engine Status	Key Status	Operation Method	HMI Status	
					Instrument Cluster	Switch
Entering Emergency Brake	Driving	Ignited/Stall	ON	Pull up EPB switch and hold it when vehicle speed is more than 3 km/h	Red P light flashes	EPB switch indicator flashes
Exiting Emergency Brake	Driving	Ignited/Stall	ON	Release EPB switch/depress accelerator pedal	No P light comes on (red P light comes on after stopping vehicle)	No indicator comes on (red P light comes on after stopping vehicle)
	Driving → Stationary			Pull and hold switch unit vehicle stops		

Meter Indicator Light and Prompt Information

No.	Indicator Light Condition or Prompt Information	Indicator Light Description	Treatment
1	Yellow P light - remains ON	EPB system malfunction	Check and repair
2	Red and yellow P lights - flash simultaneously	EPB is in check and repair mode	Check and repair
3	Red P light - flashes	In emergency brake mode	Normal, don't need to repair
4	Red P light - remains ON	EPB parking function is operative	Normal, don't need to repair
5	Green P light - remains ON	Automatic parking function is operative	Normal, don't need to repair
6	"Please depress brake pedal when releasing parking brake"	Press EPB release button when parking brake is applied and brake pedal is not depressed	Depress brake pedal and press EPB button simultaneously
7	"Please close the door"	Press automatic parking switch when a door is not closed	Close driver door and then press automatic parking switch
8	"Parking slope is too large, Please take care"	Static parking on a slope is larger than 30%	It is recommend to park vehicle on a small slope

Specifications

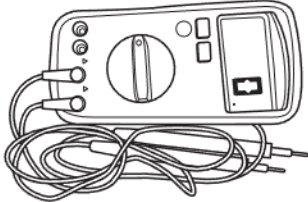
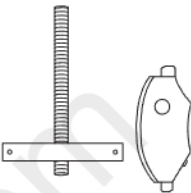
Torque Specifications

Description	Torque (N·m)
Left Integrated Caliper Motor Fixing Bolt	10 ± 1.0
Right Integrated Caliper Motor Fixing Bolt	10 ± 1.0
Left Integrated Caliper Guide Pin Bolt	30 ± 2.0
Right Integrated Caliper Guide Pin Bolt	30 ± 2.0



Tools

General Tools

Digital Multimeter	-	 002
Rear Brake Cylinder Release Tool	Part Number: CH30003; or use used brake plate	 116

DIAGNOSIS & TESTING

Diagnosis Content

Diagnostic Help

1. Connect diagnostic tester (the latest software) to diagnostic connector, and make it communicate with vehicle electronic module through data network.
2. Confirm that malfunction is current, and carry out diagnostic test and repair procedures.
3. If DTC cannot be deleted, malfunction is current.
4. Only use a digital multimeter to measure voltage of EPB system.
5. Refer to any Technical Bulletin that may apply to this malfunction.
6. Visually check related wire harness and connector.
7. Check and clean all EPB wire harness system grounds related to the latest DTC.
8. If multiple trouble codes were set, use circuit diagrams and look for any common ground circuit or power supply circuit applied to DTC.

Intermittent Troubleshooting

If malfunction is intermittent, perform the followings:

1. Check if connector is loose.
2. Check if wire harness is worn, pierced, pinched or partially broken.
3. Wiggle related wire harness and connector and observe if signal in related circuit is interrupted.
4. If possible, try to duplicate the conditions under which DTC was set.
5. Look for data that has changed or DTC to reset during wiggle test.
6. Look for broken, bent, protruded or corroded terminals.
7. Inspect the mounting areas of EPB system, wire harness or wire harness connector and so on for damage, foreign matter, etc. that will cause incorrect signals.
8. Check and clean all wire harness connectors and ground parts related to DTC.
9. Refer to any Technical Bulletin that may apply to this malfunction.

Ground Inspection

Ground points are very important to normal work of circuit, and they are often exposed to moisture, dirt and other corrosive environments. Corrosion (rust) may increase load resistance. This situation may change the way in which a circuit works. Circuits are very sensitive to proper grounding. A loose or corroded ground can affect the control circuit. Check the ground points as follows:

1. Remove ground bolt or nut.
2. Check all contact surfaces for tarnish, dirt and rust, etc.
3. Clean as necessary to ensure that contacting is in good condition.
4. Reinstall ground bolt or nut securely.
5. Check if add-on accessories interfere with ground circuit.
6. If several wire harnesses are crimped into one ground terminal, check for proper crimps. Make sure that all wire harnesses are clean and securely fastened while providing a good ground path.

DTC Confirmation Procedure

Confirm that battery voltage is over 12 V before performing following procedures

- Turn ENGINE START STOP switch to OFF.
- Connect diagnostic tester (the latest software) to diagnostic connector, and make it communicate with vehicle electronic module through data network.
- Turn ENGINE START STOP switch to ON.
- Use diagnostic tester to record and clear DTCs stored in EPB system.
- Turn ENGINE START STOP switch to OFF and wait several seconds.
- Turn ENGINE START STOP switch to ON, select "Read DTC".
- If DTC is not detected, malfunction indicated by DTC is intermittent.



Diagnosis Procedure

Hint:

- Use following procedures to troubleshoot the brake control system.

1 Vehicle brought to workshop

Result

Proceed to
Next

Next

2 Check battery voltage

Check if battery voltage is normal.

OK

Standard Voltage: Not less than 12 V

Result

Proceed to
OK
NG

NG

Replace battery or inspect and repair charging system

OK

3 Customer problem analysis

Result

Proceed to
Next

Next

4 Check and clear DTCs

Result

Proceed to
Next

Next

- 5** Confirm and duplicate malfunction: accelerate vehicle to 40 km/h or above, simulate malfunction conditions and read DTCs again

Result

Result
No DTC
Current DTC
History DTC

History DTC

- 6** Problem Repair (No DTC)

Result

Proceed to
Next

Next

Go to step 8

- 7** Troubleshoot according to Diagnostic Trouble Code (DTC) chart

Result

Proceed to
Next

Next

Go to step 8

- 8** Troubleshoot according to Problem Symptoms Table

Result

Proceed to
Next

Next

- 9** Conduct test and confirm malfunction has been repaired

Result

Proceed to
Next

Next

End



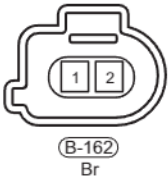
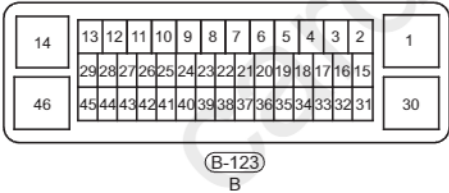
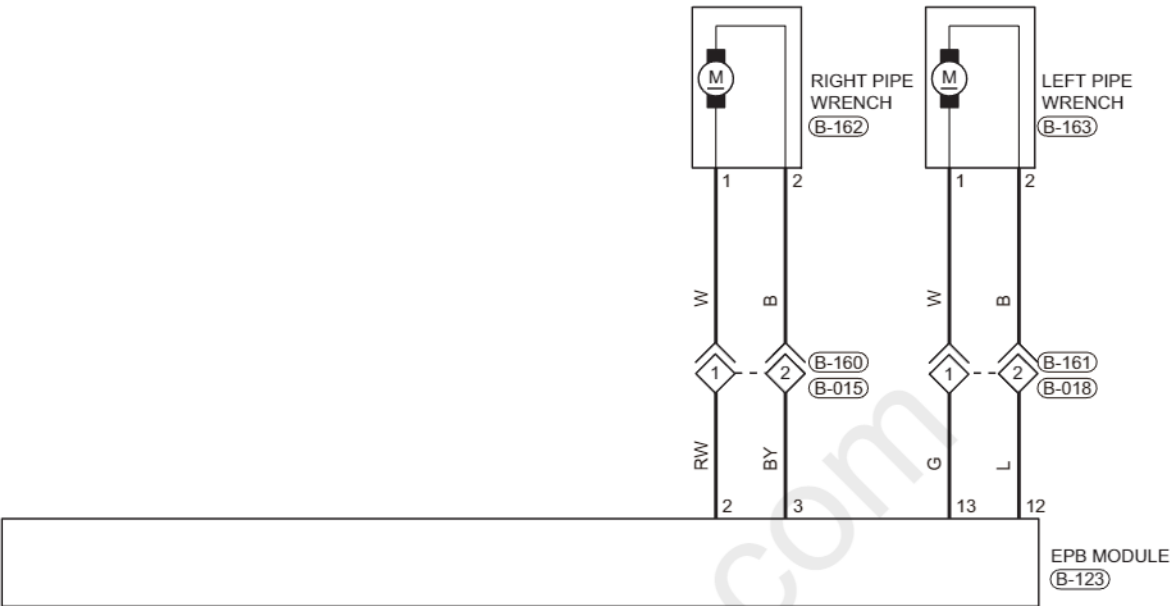
Diagnostic Trouble Code (DTC) Chart

DTC	DTC Definition
C1800-93	Left Actuator
C1800-19	Left Actuator
C1800-74	Left Actuator
C1800-73	Left Actuator
C1800-72	Left Actuator
C1800-91	Left Actuator
C1800-92	Left Actuator
C1800-97	Left Actuator
C1801-93	Right Actuator
C1801-19	Right Actuator
C1801-74	Right Actuator
C1801-73	Right Actuator
C1801-72	Right Actuator
C1801-91	Right Actuator
C1801-92	Right Actuator
C1801-97	Right Actuator
C1802-17	Supply Voltage
C1802-16	Supply Voltage
C1803-95	Assembly Test
C1804-53	Maintenance Mode
C182B-62	APB Act_Plausibility
C1824-01	APBActL_ElectricalFailure
C1825-01	APBActR_ElectricalFailure
C1822-00	APBActL_Failure
C1821-00	APBActR_Failure
C1824-1E	APBActL_ShuntOnLineOrECU
C1825-1E	APBActR_ShuntOnLineOrECU
C1830-00	APBActL_CAT
C1833-00	APBActR_UnintendedRun
C1831-00	APBActR_CAT
C1832-00	APBActL_UnintendedRun
C1826-01	APBActDriverGen_ElectricalFailure
C1807-98	Disc Over Heat
C1806-16	APB Button Under Voltage
C1823-00	APB Motor Enable Line Violation

DTC	C1800-93	Left Actuator
DTC	C1801-93	Right Actuator

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Circuit Diagram



EEB001001

Description

EPB software detects that the current is lower than threshold value when motor starts and duration is too long.

DTC	DTC Definition	DTC Detection Condition	Possible Cause	Disabled Function	Malfunction Condition
C1800-93	Left Actuator	ENGINE START STOP switch is in ON	Actuator wire harness resistance is too big	- Dynamic park - Actuator parking function - Actuator releasing function	- EPB malfunction light comes on - Actuator cannot perform parking / releasing operation
C1801-93	Right Actuator				

Caution:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

Procedure**1 Inspect left actuator wire harness or connector**

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect the left actuator wire harness connector B-163 and ESP control module connector B-123.
- Check wire harness, connector and terminal for deformation, bend or damage.

OK

Left actuator wire harness or connector is normal

Result

Proceed to
OK
NG

NG

Repair or replace left actuator wire harness or connector.

OK**2 Inspect left actuator wire harness or connector for continuity**

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Using a digital multimeter, check for continuity between ESP control module connector B-123 and left actuator connector B-163 according to value(s) in table below.

OK

Multimeter Connection	Condition	Standard Resistance
B-123 (12) - B-018 (2)	Always	$\leq 1 \Omega$
B-123 (13) - B-018 (1)	Always	$\leq 1 \Omega$

Result

Proceed to
OK
NG



NG

Repair or replace left actuator wire harness or connector

OK

3

Inspect left actuator wire harness resistance

- (a) Turn ENGINE START STOP switch to OFF.
 (b) Disconnect the negative battery cable.
 (c) Using a digital multimeter, measure resistance between ESP control module connector B-123 and left actuator connector B-163 according to value(s) in table below.

OK

Multimeter Connection	Condition	Standard Resistance
B-123 (12) - B-018 (2)	Ohms Range	$\leq 0.3 \Omega$
B-123 (13) - B-018 (1)	Ohms Range	$\leq 0.3 \Omega$

Result

Proceed to
OK
NG

NG

Replace left actuator wire harness

OK

4

Test left actuator

- (a) Turn ENGINE START STOP switch to OFF.
 (b) Disconnect left actuator wire harness connector at luggage compartment, using a digital multimeter, measure internal resistance of left actuator according to value(s) in table below.

Warning:

- The measurement result is minus multimeter error when measuring internal resistance of actuator.

Condition	Standard Resistance
Ohms Range	$0.4 \Omega - 0.9 \Omega$

Result

Proceed to
OK
NG

NG

Replace left actuator

OK

5

Reconfirm DTCs

- (a) Turn ENGINE START STOP switch to ON.
 (b) Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
 (c) Turn ENGINE START STOP switch to OFF and wait several seconds.

- (d) Turn ENGINE START STOP switch to ON.
(e) Use diagnostic tester (the latest software) to reread DTC in EPB system.

Result

Proceed to
OK
NG

OK	System operates normally
NG	Replace ESP control module

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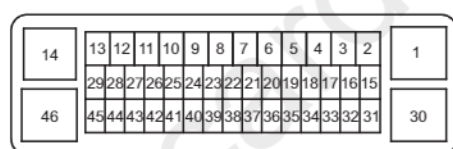
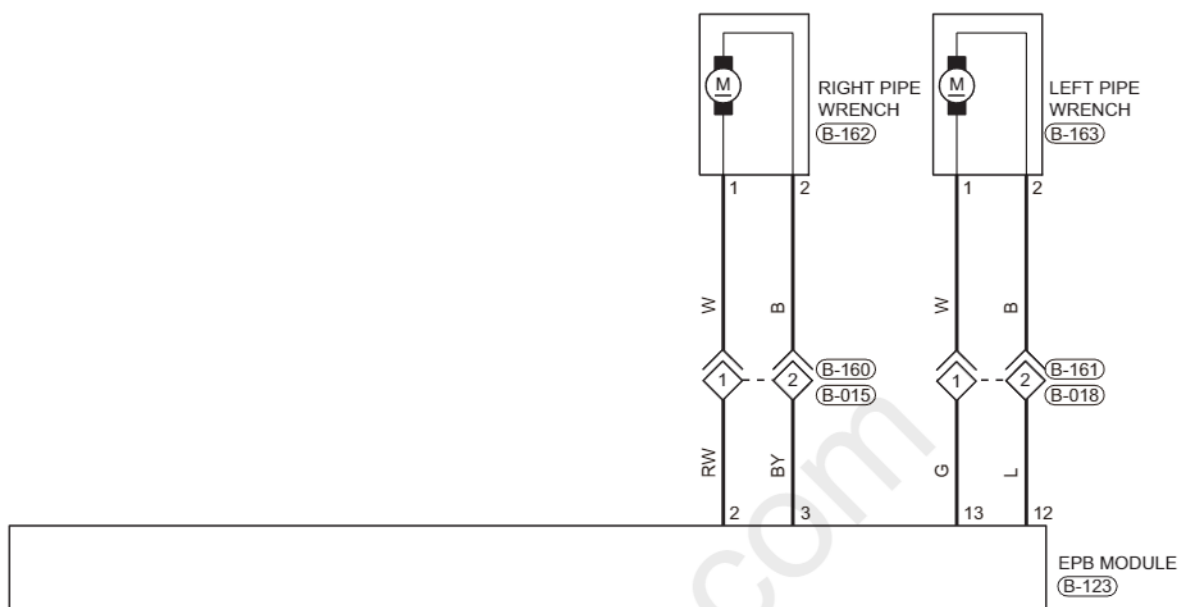


27-ELECTRONIC PARKING BRAKE SYSTEM

DTC	C1800-19	Left Actuator
DTC	C1801-19	Right Actuator

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Circuit Diagram

(B-123)
B(B-160)
B(B-161)
B(B-162)
Br(B-163)
Br

EEB001001

27-ELECTRONIC PARKING BRAKE SYSTEM

Description

EPB software detects that the current is higher than threshold value when motor starts and duration is too long.

DTC	DTC Definition	DTC Detection Condition	Possible Cause	Disabled Function	Malfunction Condition
C1800-19	Left Actuator	ENGINE START STOP switch is in ON	- Actuator wire harness or connector circuit open - Actuator wire harness resistance is too big. - Actuator internal circuit open	- Dynamic park - Actuator parking function - Actuator releasing function	- EPB malfunction light comes on - Actuator cannot perform parking / releasing operation
C1801-19	Right Actuator				

Caution:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

Procedure

1	Inspect left actuator wire harness or connector
----------	--

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect the left actuator wire harness connector B-163 and ESP control module connector B-123.
- Check wire harness, connector and terminal for deformation, bend or damage.

Result

Proceed to
OK
NG

NG	Repair or replace left actuator wire harness or connector
-----------	--



2	Inspect left actuator wire harness or connector for short circuit
----------	--

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect connector B-123 and left actuator connector B-163. Using a digital multimeter, check for continuity between ESP control module connector B-123 and left actuator connector B-163 and ground according to value(s) in table below.

OK

Multimeter Connection	Condition	Specified Condition
B-123 (12) - Ground	Always	∞
B-123 (13) - Ground	Always	∞
B-123 (12) - B-123 (13)	Always	∞
B-163 (1) - Ground	Always	∞
B-163 (2) - Ground	Always	∞

Result

Proceed to
OK
NG

NG

Repair or replace left actuator wire harness or connector

OK**3****Test left actuator**

- (a) Turn ENGINE START STOP switch to OFF.
 (b) Disconnect left actuator wire harness connector at luggage compartment, using a digital multimeter, measure internal resistance of left actuator according to value(s) in table below.

Warning:

- The measurement result is minus multimeter error when measuring internal resistance of actuator.

Condition	Standard Resistance
Ohms Range	0.4 Ω - 0.9 Ω

Result

Proceed to
OK
NG

NG

Replace left actuator

OK**4****Reconfirm DTCs**

- (a) Turn ENGINE START STOP switch to ON.
 (b) Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
 (c) Turn ENGINE START STOP switch to OFF and wait several seconds.
 (d) Turn ENGINE START STOP switch to ON.
 (e) Use diagnostic tester (the latest software) to reread DTC in EPB system.

Result

Proceed to
OK
NG

OK

System operates normally

NG

Replace ESP control module



DTC	C1800-74	Left Actuator
DTC	C1801-74	Right Actuator

Description

EPB software detects that left motor is performing parking for a certain time, but cannot complete parking.

DTC	DTC Definition	DTC Detection Condition	Possible Cause	Malfunction Condition	Disabled Function
C1800-74	Left Actuator	ENGINE START STOP switch is in ON	• Actuator mechanical malfunction	• EPB malfunction light comes on • Actuator cannot perform manual parking / releasing operation	• Dynamic park • Actuator parking function • Actuator releasing function
C1801-74	Right Actuator				

Caution:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

Procedure

1	Inspect if left actuator and caliper are installed properly
----------	--

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect the left actuator wire harness connector.
- Inspect if the left actuator and caliper are installed properly.

Result

Proceed to
OK
NG

NG	Repair or reinstall left actuator and caliper
-----------	--

OK

2	Test left actuator
----------	---------------------------

- Turn ENGINE START STOP switch to OFF.
- Disconnect left actuator wire harness connector at luggage compartment, using a digital multimeter, measure internal resistance of left actuator according to value(s) in table below.

Warning:

- The measurement result is minus multimeter error when measuring internal resistance of actuator.

Condition	Standard Resistance
Ohms Range	0.4 Ω - 0.9 Ω

Result

Proceed to
OK
NG

NG

Replace left actuator

OK

3**Reconfirm DTCs**

- (a) Turn ENGINE START STOP switch to ON.
- (b) Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
- (c) Turn ENGINE START STOP switch to OFF and wait several seconds.
- (d) Turn ENGINE START STOP switch to ON.
- (e) Use diagnostic tester (the latest software) to reread DTC in EPB system.

Result

Proceed to
OK
NG

OK

System operates normally

NG

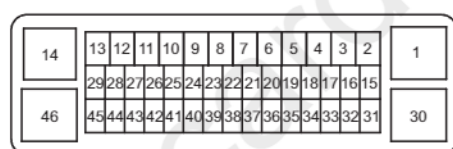
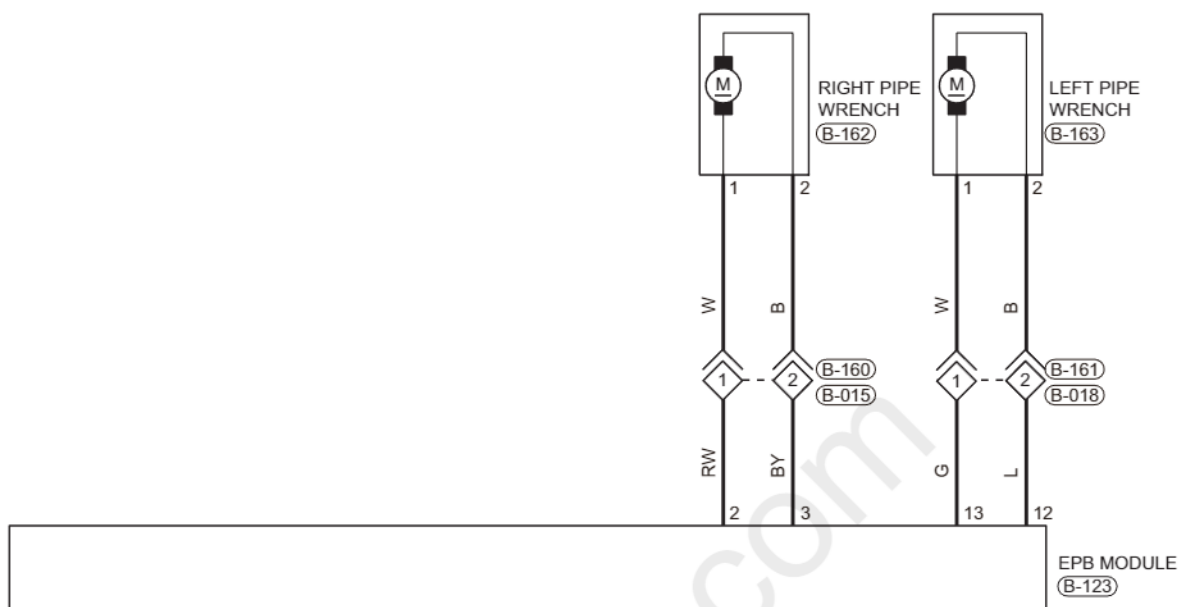
Replace ESP control module



DTC	C1800-73	Left Actuator
DTC	C1801-73	Right Actuator

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Circuit Diagram

(B-123)
B(B-160)
B(B-161)
B(B-162)
Br(B-163)
Br

EEB001001

27-ELECTRONIC PARKING BRAKE SYSTEM

Description

EPB software detects that motor is clamping for a certain time, but cannot reach target parking force

DTC	DTC Definition	DTC Detection Condition	Possible Cause	Malfunction Condition	Disabled Function
C1800-73	Left Actuator	ENGINE START STOP switch is in ON	- System voltage low - Actuator wire harness resistance is too big - Actuator internal resistance is too big	- EPB malfunction light comes on - Actuator cannot perform parking operation properly	- Dynamic park - Actuator parking function - Actuator releasing function
C1801-73	Right Actuator				

Caution:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

Procedure

1 Inspect if left actuator and caliper are installed properly

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect the left actuator wire harness connector.
- Inspect if the left actuator and caliper are installed properly.

Result

Proceed to
OK
NG

NG

Repair or reinstall left actuator and caliper

OK

2 Check if battery voltage is low

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Measure if battery voltage is lower than 12 V with a digital multimeter.

Result

Proceed to
OK
NG

NG

Test again after charging or replacing battery

OK

3 Inspect left actuator wire harness resistance

- Turn ENGINE START STOP switch to OFF.

- (b) Disconnect the negative battery cable.
 (c) Using a digital multimeter, measure resistance between ESP control module connector B-123 and left actuator connector B-163 according to value(s) in table below.

OK

Multimeter Connection	Condition	Standard Resistance
B-123 (12) - B-018 (2)	Ohms Range	$\leq 0.3 \Omega$
B-123 (13) - B-018 (1)	Ohms Range	$\leq 0.3 \Omega$

Result

Proceed to
OK
NG

NG

Replace left actuator wire harness

OK

4 Test left actuator

- (a) Turn ENGINE START STOP switch to OFF.
 (b) Disconnect left actuator wire harness connector at luggage compartment, using a digital multimeter, measure internal resistance of left actuator according to value(s) in table below.

Warning:

- The measurement result is minus multimeter error when measuring internal resistance of actuator.

Condition	Standard Resistance
Ohms Range	$0.4 \Omega - 0.9 \Omega$

Result

Proceed to
OK
NG

NG

Replace left actuator

OK

5 Reconfirm DTCs

- (a) Turn ENGINE START STOP switch to ON.
 (b) Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
 (c) Turn ENGINE START STOP switch to OFF and wait several seconds.
 (d) Turn ENGINE START STOP switch to ON.
 (e) Use diagnostic tester (the latest software) to reread DTC in EPB system.

Result

Proceed to
OK
NG

OK

System operates normally



NG

Replace ESP control module

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DTC	C1800-72	Left Actuator
------------	-----------------	----------------------

DTC	C1801-72	Right Actuator
------------	-----------------	-----------------------

Description

EPB software detects that left motor is performing releasing for a certain time, but cannot return to target position

DTC	DTC Definition	DTC Detection Condition	Possible Cause	Malfunction Condition	Disabled Function
C1800-72	Left Actuator	ENGINE START STOP switch is in ON	Left actuator internal mechanical malfunction, cannot release normally	- EPB malfunction light comes on - Left actuator cannot release parking brake normally	- Dynamic park - Left actuator parking function - Left actuator releasing function
C1801-72	Right Actuator				

Caution:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

Procedure

1	Inspect if left actuator and caliper are installed properly
----------	--

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect the left actuator wire harness connector.
- Inspect if the left actuator and caliper are installed properly.

Result

Proceed to
OK
NG

NG	Repair or replace left actuator and caliper
-----------	--

OK

2	Inspect left actuator internal for foreign matter
----------	--

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect the left actuator wire harness connector.
- Remove the left actuator.
- Inspect left actuator internal for foreign matter, which cause the motor rotary resistance too high and cannot complete release operation normally.

Result

Proceed to
OK
NG

NG	Clear up the foreign matter in left actuator
-----------	---



OK

3 Test left actuator

- (a) Turn ENGINE START STOP switch to OFF.
 (b) Disconnect left actuator wire harness connector at luggage compartment, using a digital multimeter, measure internal resistance of left actuator according to value(s) in table below.

Warning:

- The measurement result is minus multimeter error when measuring internal resistance of actuator.

Condition	Standard Resistance
Ohms Range	0.4 Ω - 0.9 Ω

Result

Proceed to
OK
NG

NG

Replace left actuator

OK

4 Reconfirm DTCs

- (a) Turn ENGINE START STOP switch to ON.
 (b) Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
 (c) Turn ENGINE START STOP switch to OFF and wait several seconds.
 (d) Turn ENGINE START STOP switch to ON.
 (e) Use diagnostic tester (the latest software) to reread DTC in EPB system.

Result

Proceed to
OK
NG

OK

System operates normally

NG

Replace ESP control module

DTC	C1800-91	Left Actuator
------------	-----------------	----------------------

DTC	C1801-91	Right Actuator
------------	-----------------	-----------------------

Description

EPB software detects that internal resistance is abnormal when motor starts.

DTC	DTC Definition	DTC Detection Condition	Possible Cause	Malfunction Condition	Disabled Function
C1800-91	Left Actuator	ENGINE START STOP switch is in ON	- Actuator wire harness or connector resistance is too big - Actuator internal motor resistance is abnormal	- EPB malfunction light comes on - Parking / releasing function cannot be performed by pulling up / pressing down the switch.	- Dynamic park - Actuator parking function - Actuator releasing function
C1801-91	Right Actuator				

Caution:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

Procedure

1	Inspect if it is caused by incomplete left actuator wire harness
----------	---

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect the left actuator wire harness connector.
- Inspect if it is caused by incomplete left actuator wire harness (splicing, damage, deterioration, etc.), which lead to big resistance of left wire harness, parking and releasing operation cannot be completed normally.

Result

Proceed to
OK
NG

NG

Repair or replace left actuator wire harness

OK

2	Test left actuator
----------	---------------------------

- Turn ENGINE START STOP switch to OFF.
- Disconnect left actuator wire harness connector at luggage compartment, using a digital multimeter, measure internal resistance of left actuator according to value(s) in table below.

Warning:

- The measurement result is minus multimeter error when measuring internal resistance of actuator.

Condition	Standard Resistance
Ohms Range	0.4 Ω - 0.9 Ω



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Result

Proceed to
OK
NG

NG

Replace left actuator

OK

3

Reconfirm DTCs

- (a) Turn ENGINE START STOP switch to ON.
- (b) Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
- (c) Turn ENGINE START STOP switch to OFF and wait several seconds.
- (d) Turn ENGINE START STOP switch to ON.
- (e) Use diagnostic tester (the latest software) to reread DTC in EPB system.

Result

Proceed to
OK
NG

OK

System operates normally

NG

Replace ESP control module

DTC	C1800-92	Left Actuator
------------	-----------------	----------------------

DTC	C1801-92	Right Actuator
------------	-----------------	-----------------------

Description

EPB software detects that resistance is too large when motor idles.

DTC	DTC Definition	DTC Detection Condition	Possible Cause	Malfunction Condition	Disabled Function
C1800-92	Left Actuator	ENGINE START STOP switch is in ON	Actuator mechanical malfunction (such as foreign matter inside)	- EPB malfunction light comes on - Actuator cannot perform parking operation by pulling up switch	- Dynamic park - Actuator parking function - Actuator releasing function
C1801-92	Right Actuator				

Caution:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

Procedure

1	Test left actuator
----------	---------------------------

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect the left actuator wire harness connector.
- Replace actuator with a new one and test again, confirm if it is caused by actuator internal mechanical malfunction.

Result

Proceed to
OK
NG

NG	Replace left actuator
-----------	------------------------------

OK

2	Reconfirm DTCs
----------	-----------------------

- Turn ENGINE START STOP switch to ON.
- Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
- Turn ENGINE START STOP switch to OFF and wait several seconds.
- Turn ENGINE START STOP switch to ON.
- Use diagnostic tester (the latest software) to reread DTC in EPB system.

OK

No same DTC is output

Result

Proceed to
OK
NG



27-ELECTRONIC PARKING BRAKE SYSTEM

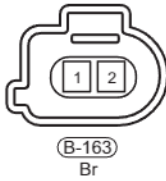
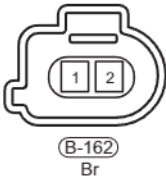
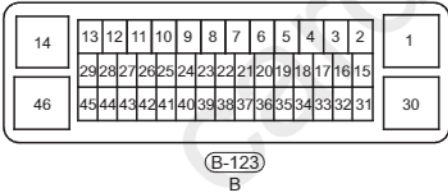
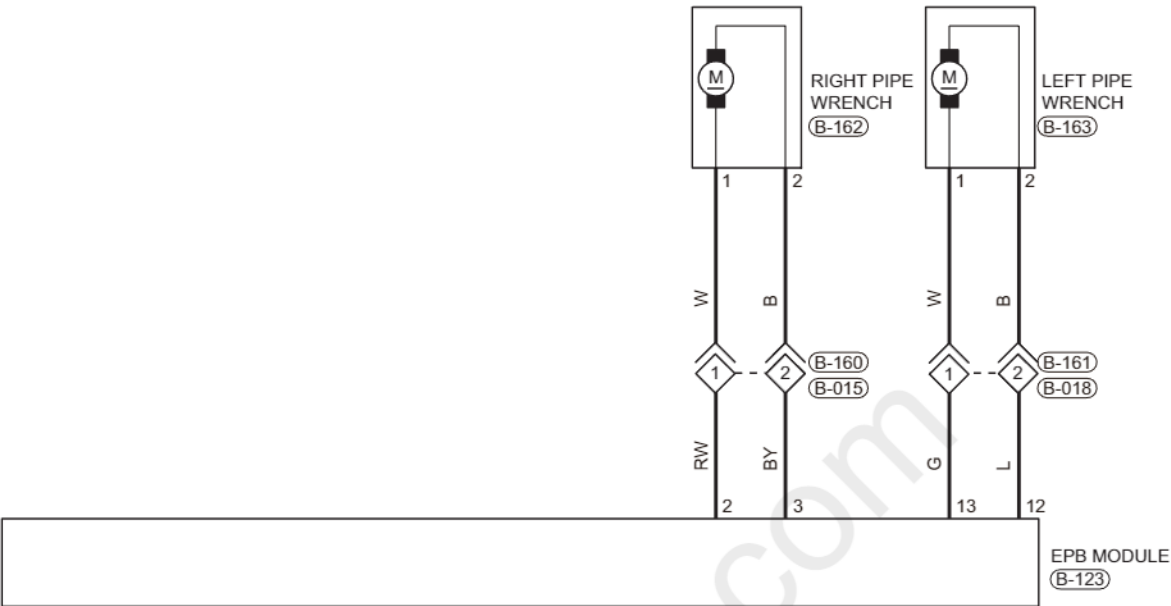
OK	System operates normally
NG	Replace ESP control module

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DTC	C1800-97	Left Actuator
DTC	C1801-97	Right Actuator

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Circuit Diagram



EEB001001

Description

EPB software detects that motor current and voltage signal is abnormal

DTC	DTC Definition	DTC Detection Condition	Possible Cause	Malfunction Condition	Disabled Function
C1800-97	Left Actuator	ENGINE START STOP switch is in ON	- Actuator wire harness circuit open - Actuator or wire harness circuit short - Manual parking release via switch operation frequency is too high	- EPB malfunction light comes on - Actuator cannot perform parking / releasing function by pulling up / pressing down switch.	- All functions of actuator are invalid - Dynamic park
C1801-97	Right Actuator				

Caution:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

Procedure**1** Inspect if left actuator and caliper are installed properly

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect the left actuator wire harness connector.
- Inspect if the left actuator and caliper are installed properly.

Result

Proceed to
OK
NG

NG

Reinstall and adjust left actuator and caliper

OK

2 Inspect if the left actuator wire harness and connector are in good condition

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect the left actuator wire harness connector.
- Inspect if the left actuator wire harness and connector are in good condition.

Result

Proceed to
OK
NG

NG

Repair or replace left actuator wire harness and connector

OK

27



3

Inspect left actuator wire harness and connector for short circuit

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect ESP control module connector B-123 and left actuator connector B-163.
- Using a digital multimeter, measure and inspect if left actuator wire harness and connector are short according to value(s) in table below.

OK

Multimeter Connection	Condition	Specified Condition
B-123 (13) - B-163 (1)	Ohms Range	$\leq 1 \Omega$
Q-14 (12) - B-163 (2)	Ohms Range	$\leq 1 \Omega$
B-123 (13) - Body ground	Ohms Range	∞
B-123 (12) - Body ground	Ohms Range	∞

Result

Proceed to
OK
NG

NG

Repair or replace left actuator wire harness

OK

4

Test left actuator

- Turn ENGINE START STOP switch to OFF.
- Disconnect left actuator wire harness connector at luggage compartment, using a digital multimeter, measure internal resistance of left actuator according to value(s) in table below.

Warning:

- The measurement result is minus multimeter error when measuring internal resistance of actuator.

Condition	Standard Resistance
Ohms Range	$0.4 \Omega - 0.9 \Omega$

Result

Proceed to
OK
NG

NG

Replace left actuator

OK

5 Reconfirm DTCs

- (a) Turn ENGINE START STOP switch to ON.
- (b) Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
- (c) Turn ENGINE START STOP switch to OFF and wait several seconds.
- (d) Turn ENGINE START STOP switch to ON.
- (e) Use diagnostic tester (the latest software) to reread DTC in EPB system.

Result

Proceed to
OK
NG

OK**System operates normally****NG****Replace ESP control module**

DTC	C1802-17	Supply Voltage
------------	-----------------	-----------------------

Description

Battery voltage exceeds the set threshold voltage and duration is too long.

DTC	DTC Definition	DTC Detection Condition	Possible Cause	Malfunction Condition	Disabled Function
C1802-17	Supply Voltage	ENGINE START STOP switch is in ON	- External power supply voltage is too high or battery is damaged - ECU internal fault	- EPB malfunction light comes on - EPB does not response to clamping and releasing request	All functions of EPB are invalid

Caution:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

Procedure

1	Measure vehicle battery voltage
----------	--

- (a) Start vehicle and idle.
 (b) Measure if battery voltage is higher than 16.5V.

Result

Proceed to
OK
NG

NG	Check and repair charging system
-----------	---

OK

2	Reconfirm DTCs
----------	-----------------------

- (a) Turn ENGINE START STOP switch to ON.
 (b) Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
 (c) Turn ENGINE START STOP switch to OFF and wait several seconds.
 (d) Turn ENGINE START STOP switch to ON.
 (e) Use diagnostic tester (the latest software) to reread DTC in EPB system.

Result

Proceed to
OK
NG

OK	System operates normally
-----------	---------------------------------

NG	Replace ESP control module
-----------	-----------------------------------

DTC	C1802-16	Supply Voltage
------------	-----------------	-----------------------

Description

Battery voltage is lower than the set threshold voltage and duration is too long.

DTC	DTC Definition	DTC Detection Condition	Possible Cause	Malfunction Condition	Disabled Function
C1802-16	Supply Voltage	ENGINE START STOP switch is in ON	- Battery voltage is too low or battery is damaged - Connection line is in poor contact with positive/negative of battery - ECU internal fault	- EPB malfunction light comes on - EPB does not response to clamping and releasing request	All functions of EPB are invalid

Caution:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

Procedure

1	Measure vehicle battery voltage
----------	--

- (a) Measure if battery voltage is lower than 12V when vehicle is idling and engine stalls.

Result

Proceed to
OK
NG

NG

Check and repair charging system or replace battery

OK

2	Check EPB power source connection line
----------	---

- (a) Turn ENGINE START STOP switch to OFF.
 (b) Disconnect the negative battery cable.
 (c) Check if EPB power source connection line is in poor contact with positive/negative of battery, or resistance is too big due to large area oxidation on contact surface.

Result

Proceed to
OK
NG

NG

Check and repair charging system or replace battery

OK



3	Reconfirm DTCs
---	----------------

- (a) Turn ENGINE START STOP switch to ON.
- (b) Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
- (c) Turn ENGINE START STOP switch to OFF and wait several seconds.
- (d) Turn ENGINE START STOP switch to ON.
- (e) Use diagnostic tester (the latest software) to reread DTC in EPB system.

Result

Proceed to
OK
NG

OK	System operates normally
NG	Replace ESP control module

DTC	C1803-95	Assembly Test
------------	-----------------	----------------------

Description

EPB assembly test incomplete mark position is modified.

DTC	DTC Definition	DTC Detection Condition	Possible Cause	Malfunction Condition	Disabled Function
C1803-95	Assembly Test	ENGINE START STOP switch is in ON	- Assembly test is not performed after completion of EPB - Power is not turned off normally after performing assembly test	- EPB malfunction light comes on "Assembly Test is not performed" malfunction is displayed when reading DTC.	None

Caution:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

Procedure

1	Perform assembly calibration normally by diagnostic tester
----------	---

- Assembly calibration is not performed after completion of EPB, after performing assembly calibration normally by diagnostic tester, turn off power normally.
- Turn power on again after EPB sleeps, EPB malfunction light goes off, there is no current malfunction "Assembly Test".

2	Reconfirm DTCs
----------	-----------------------

- Turn ENGINE START STOP switch to ON.
- Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
- Turn ENGINE START STOP switch to OFF and wait several seconds.
- Turn ENGINE START STOP switch to ON.
- Use diagnostic tester (the latest software) to reread DTC in EPB system.

OK

No same DTC is output



DTC	C1804-53	Maintenance Mode
------------	-----------------	-------------------------

Description

EPB maintenance mode mark position is modified

DTC	DTC Definition	DTC Detection Condition	Possible Cause	Malfunction Condition	Disabled Function
C1804-53	Maintenance Mode	ENGINE START STOP switch is in ON	Enter maintenance mode due to replacement of EPB calipers or friction linings, and the maintenance mode has not been exited by diagnostic tester.	- EPB malfunction light comes on; "EPB Maintenance Mode" is displayed when reading DTC by diagnostic tester. - Motor on both sides do not respond to switch requests	All functions except diagnostic function (exit maintenance mode) are invalid

Caution:

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

Procedure

1	After maintenance is completed, maintenance mode function exit will be performed through the diagnostic tester
----------	---

- In EPB maintenance state, after maintenance is completed, maintenance mode function exit will be performed through the diagnostic tester.
- After the normal execution of maintenance mode exit request, the vehicle power is turned off normally (IGN off).
- Turn power on again after ESP sleeps, EPB malfunction light goes off (no other faults in system).

2	Reconfirm DTCs
----------	-----------------------

- Turn ENGINE START STOP switch to ON.
- Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
- Turn ENGINE START STOP switch to OFF and wait several seconds.
- Turn ENGINE START STOP switch to ON.
- Use diagnostic tester (the latest software) to reread DTC in EPB system.

OK

No same DTC is output

DTC	C182B-62	APB Act_Plausibility
------------	-----------------	-----------------------------

Description**Caution:**

When performing circuit diagnosis and test, always refer to the circuit diagram for specific circuit and component information.

Procedure

1	Perform Active Test using diagnostic tester
----------	--

- (a) Clamp and release left and right rear wheel brake caliper.

Result

Proceed to
OK
NG

OK	End
-----------	------------

NG

2	Check wire harness and connector
----------	---

- (a) Turn ENGINE START STOP switch to OFF.
 (b) Disconnect the negative battery cable.
 (c) Disconnect the left actuator wire harness and connector.
 (d) Check if wire harnesses are worn, pierced, pinched or partially broken.
 (e) Check for broken, bent, protruded or corroded terminals.
 (f) Check if terminal contact pins of related connectors are in good condition.

Result

Proceed to
OK
NG

NG	Repair or replace related wire harness and connector
-----------	---

OK

3	Check left caliper motor
----------	---------------------------------

- (a) Turn ENGINE START STOP switch to OFF.
 (b) Disconnect the negative battery cable.
 (c) Disconnect the left actuator connector, replace actuator and test.

OK

Motor rotates normally

Result

Proceed to
OK



27-ELECTRONIC PARKING BRAKE SYSTEM

Proceed to
NG

NG	Replace left parking brake actuator
----	-------------------------------------



4	Reconfirm DTCs
---	----------------

- (a) Turn ENGINE START STOP switch to ON.
- (b) Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
- (c) Turn ENGINE START STOP switch to OFF and wait several seconds.
- (d) Turn ENGINE START STOP switch to ON.
- (e) Use diagnostic tester (the latest software) to reread DTC in EPB system.

Result

Proceed to
OK
NG

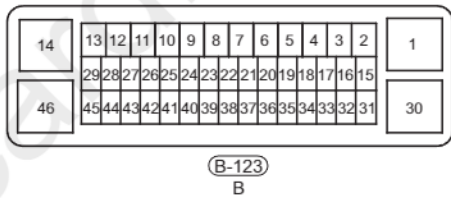
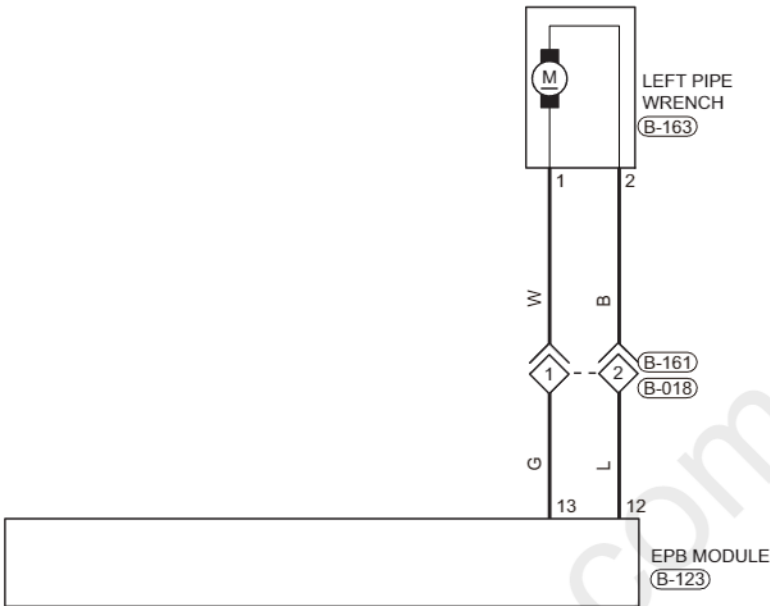
OK	Same DTC is not output
NG	Replace ABS/ESP control module

DTC	C1824-01	APBActL_ElectricalFailure
DTC	C1822-00	APBActL_Failure
DTC	C1824-1E	APBActL_ShuntOnLineOrECU

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Circuit Diagram



EEB001101

Caution:

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Procedure**1 Check wire harness and connector**

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Disconnect the negative battery cable.
- (c) Disconnect the left actuator wire harness and connector.
- (d) Check if wire harnesses are worn, pierced, pinched or partially broken.
- (e) Check for broken, bent, protruded or corroded terminals.
- (f) Check if terminal contact pins of related connectors are in good condition.

Result

Proceed to
OK
NG

NG

Repair or replace related wire harness and connector

OK**2 Check left caliper motor**

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Disconnect the negative battery cable.
- (c) Disconnect the left actuator connector, replace actuator and test.

OK

Motor rotates normally

Result

Proceed to
OK
NG

NG

Replace left parking brake actuator

OK**3 Check wire harness and connector for continuity**

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Disconnect the negative battery cable.
- (c) Using ohm band of multimeter, check for continuity between terminal 13 of B-123 and terminal 16 of B-018.

OK

Multimeter Connection	Condition	Specified Condition
B-123 (13) - B-018 (16)	Always	$\leq 1 \Omega$



27-ELECTRONIC PARKING BRAKE SYSTEM

- (d) Using ohm band of multimeter, check for continuity between terminal 16 of B-018 and terminal 1 of B-163.

OK

Multimeter Connection	Condition	Specified Condition
B-018 (16) - B-163 (1)	Always	$\leq 1 \Omega$

- (e) Using ohm band of multimeter, check for continuity between terminal 12 of B-123 and terminal 4 of B-018.

OK

Multimeter Connection	Condition	Specified Condition
B-123 (12) - B-018 (4)	Always	$\leq 1 \Omega$

- (f) Using ohm band of multimeter, check for continuity between terminal 4 of B-018 and terminal 2 of B-163.

OK

Multimeter Connection	Condition	Specified Condition
B-018 (4) - B-163 (2)	Always	$\leq 1 \Omega$

- (g) Using a digital multimeter, check if left caliper motor connector is short to ground according to the table below.

OK

Multimeter Connection	Condition	Specified Condition
B-163 (1) - Body ground	Always	∞
B-163 (2) - Body ground	Always	∞

- (h) Disconnect the negative battery cable.

- (i) Turn ENGINE START STOP switch to ON.

- (j) Using a digital multimeter, check if left caliper motor connector is short to power source according to the table below.

OK

Multimeter Connection	Condition	Specified Condition
B-163 (1) - Body ground	ENGINE START STOP switch is in ON	Approx. 0 V
B-163 (2) - Body ground	ENGINE START STOP switch is in ON	Approx. 0 V

Result

Proceed to
OK
NG

NG

Repair or replace wire harness and connector between left caliper motor connector and ABS/ESP control module assembly

OK

4 Reconfirm DTCs

- (a) Turn ENGINE START STOP switch to ON.
- (b) Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
- (c) Turn ENGINE START STOP switch to OFF and wait several seconds.
- (d) Turn ENGINE START STOP switch to ON.
- (e) Use diagnostic tester (the latest software) to reread DTC in EPB system.

Result

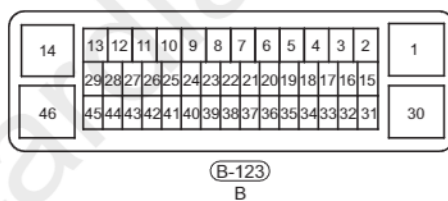
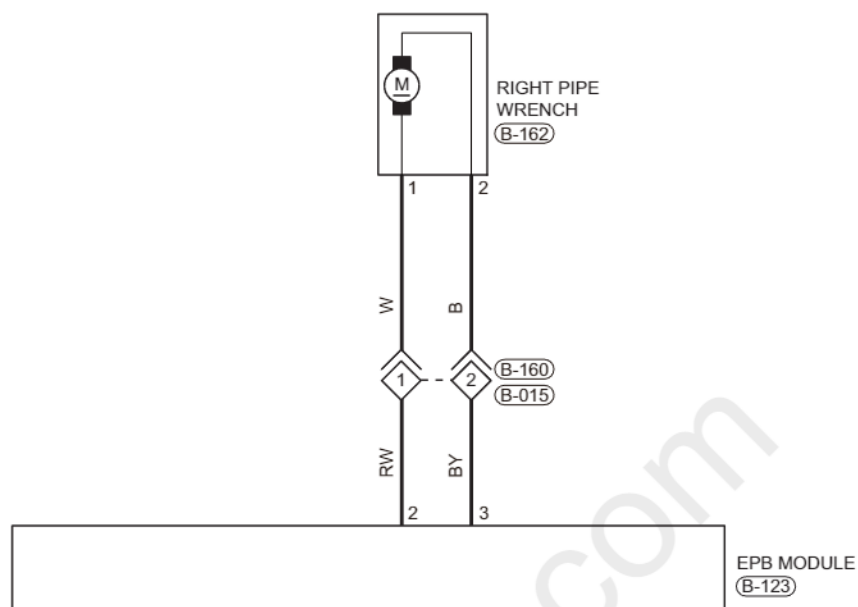
Proceed to
OK
NG

OK**System operates normally****NG****Replace left parking brake actuator**

DTC	C1825-01	APBActR_ElectricalFailure
DTC	C1821-00	APBActR_Failure
DTC	C1825-1E	APBActR_ShuntOnLineOrECU

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Circuit Diagram



EEB001201

27-ELECTRONIC PARKING BRAKE SYSTEM

Caution:

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Procedure

1 Check wire harness and connector

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Disconnect the negative battery cable.
- (c) Disconnect the right actuator wire harness and connector.
- (d) Check if wire harnesses are worn, pierced, pinched or partially broken.
- (e) Check for broken, bent, protruded or corroded terminals.
- (f) Check if terminal contact pins of related connectors are in good condition.

Result

Proceed to
OK
NG

NG

Repair or replace related wire harness and connector

OK

2 Check right caliper motor

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Disconnect the negative battery cable.
- (c) Disconnect the right actuator connector, replace actuator and test.

OK

Motor rotates normally

Result

Proceed to
OK
NG

NG

Replace right parking brake actuator

OK

3 Check wire harness and connector for continuity

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Disconnect the negative battery cable.
- (c) Using ohm band of multimeter, check for continuity between terminal 2 of B-123 and terminal 1 of B-015.

OK

Multimeter Connection	Condition	Specified Condition
B-123 (2) - B-015 (1)	Always	$\leq 1 \Omega$

- (d) Using ohm band of multimeter, check for continuity between terminal 1 of B-015 and terminal 1 of B-162.

OK

Multimeter Connection	Condition	Specified Condition
B-015 (1) - B-162 (1)	Always	$\leq 1 \Omega$

- (e) Using ohm band of multimeter, check for continuity between terminal 3 of B-123 and terminal 10 of B-015.

OK

Multimeter Connection	Condition	Specified Condition
B-123 (3) - B-015 (10)	Always	$\leq 1 \Omega$

- (f) Using ohm band of multimeter, check for continuity between terminal 10 of B-015 and terminal 2 of B-162.

OK

Multimeter Connection	Condition	Specified Condition
B-015 (10) - B-162 (2)	Always	$\leq 1 \Omega$

- (g) Using a digital multimeter, check if right caliper motor connector is short to ground according to the table below.

OK

Multimeter Connection	Condition	Specified Condition
B-162 (1) - Body ground	Always	∞
B-162 (2) - Body ground	Always	∞

- (h) Disconnect the negative battery cable.

- (i) Turn ENGINE START STOP switch to ON.

- (j) Using a digital multimeter, check if right caliper motor connector is short to power source according to the table below.

OK

Multimeter Connection	Condition	Specified Condition
B-162 (1) - Body ground	ENGINE START STOP switch is in ON	Approx. 0 V
B-162 (2) - Body ground	ENGINE START STOP switch is in ON	Approx. 0 V

Result

Proceed to
OK
NG

NG

Repair or replace wire harness and connector between right caliper motor connector and ABS/ESP control module assembly

OK

4 Reconfirm DTCs

- (a) Turn ENGINE START STOP switch to ON.
- (b) Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
- (c) Turn ENGINE START STOP switch to OFF and wait several seconds.
- (d) Turn ENGINE START STOP switch to ON.
- (e) Use diagnostic tester (the latest software) to reread DTC in EPB system.

Result

Proceed to
OK
NG

OK**System operates normally****NG****Replace right parking brake actuator**

DTC	C1830-00	APBActR_CAT
------------	-----------------	--------------------

DTC	C1831-00	APBActR_CAT
------------	-----------------	--------------------

Caution:

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

1	Check wire harness and connector for continuity
----------	--

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Disconnect the negative battery cable.
- (c) Check continuity of wire harness between ABS/ESP and actuator using resistance gear of multimeter.

Result

Proceed to
OK
NG

NG

Repair or replace wire harness and connector between caliper motor connector and ABS/ESP control module assembly

OK

2	Check caliper actuator motor
----------	-------------------------------------

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Disconnect the negative battery cable.
- (c) Disconnect the right actuator connector, replace actuator and test.

OK

Motor rotates normally

Result

Proceed to
OK
NG

NG

Replace parking brake actuator

OK

3	Reconfirm DTCs
----------	-----------------------

- (a) Turn ENGINE START STOP switch to ON.
- (b) Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
- (c) Turn ENGINE START STOP switch to OFF and wait several seconds.
- (d) Turn ENGINE START STOP switch to ON.
- (e) Use diagnostic tester (the latest software) to reread DTC in EPB system.

Result

Proceed to
OK
NG

OK**System operates normally****NG****Replace ESP/ABS control module**

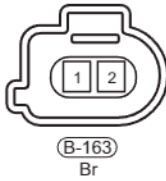
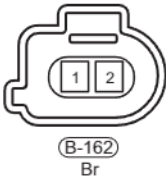
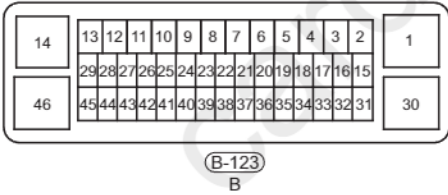
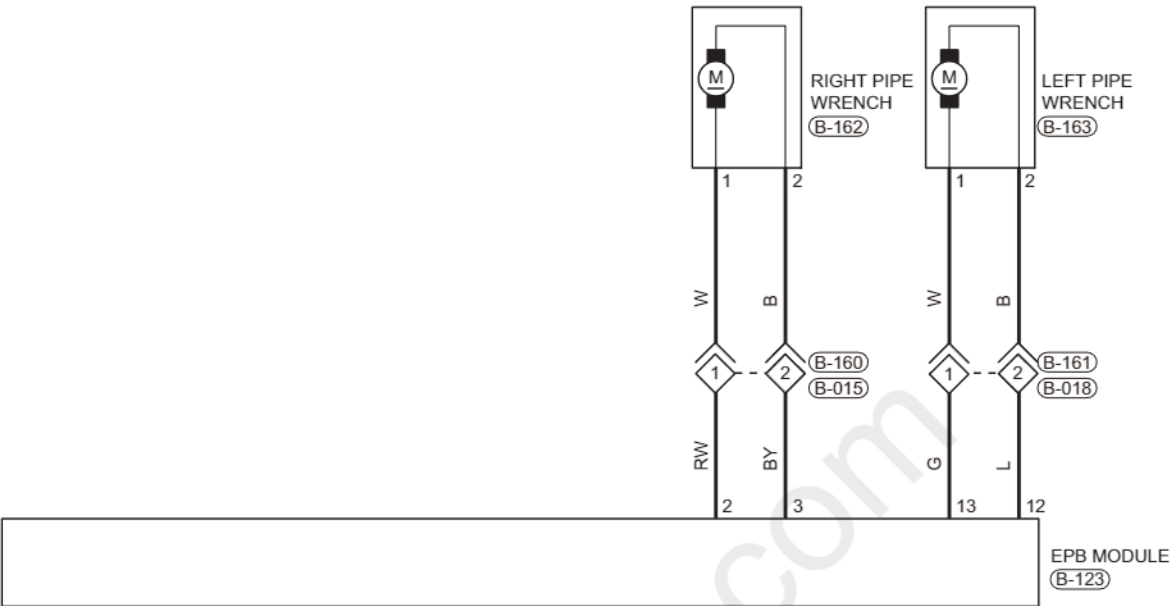
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DTC	C1833-00	APBActR_UnintendedRun
DTC	C1832-00	APBActL_UnintendedRun

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Circuit Diagram



EEB001001

Hint:

The right actuator check shall prevail

Caution:

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

1	Check if right actuator is short to power source
----------	---

- (a) Connect the negative battery cable.
- (b) Turn ENGINE START STOP switch to ON.
- (c) Using a digital multimeter, check if right caliper motor connector is short to power source according to the table below.

OK

Multimeter Connection	Condition	Specified Condition
B-162 (1) - Body ground	ENGINE START STOP switch is in ON	Approx. 0 V
B-162 (2) - Body ground	ENGINE START STOP switch is in ON	Approx. 0 V

Result

Proceed to
OK
NG

NG

Repair or replace wire harness and connector between right caliper motor connector and ABS/ESP control module assembly

OK

2	Reconfirm DTCs
----------	-----------------------

- (a) Turn ENGINE START STOP switch to ON.
- (b) Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
- (c) Turn ENGINE START STOP switch to OFF and wait several seconds.
- (d) Turn ENGINE START STOP switch to ON.
- (e) Use diagnostic tester (the latest software) to reread DTC in EPB system.

Result

Proceed to
OK
NG

OK

System operates normally

NG

Replace ESP/ABS control module



DTC	C1826-01	APBActDriverGen_ElectricalFailure
------------	-----------------	--

Caution:

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

1	Check actuator connector
----------	---------------------------------

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Disconnect the negative battery cable.
- (c) Check if actuator connector is installed firmly.
- (d) Check if installing position of actuator connector is dirty.

Result

Proceed to
OK
NG

NG

Install actuator connector correctly and firmly.

OK

2	Perform Active Test using diagnostic tester
----------	--

- (a) Clamp and release left and right rear wheel brake caliper.

Result

Proceed to
OK
NG

OK

End

NG

3	Check caliper actuator motor
----------	-------------------------------------

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Disconnect the negative battery cable.
- (c) Replace actuator and retest.

OK

Motor rotates normally

Result

Proceed to
OK
NG

NG

Replace parking brake actuator

OK

4 Reconfirm DTCs

- (a) Turn ENGINE START STOP switch to ON.
- (b) Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
- (c) Turn ENGINE START STOP switch to OFF and wait several seconds.
- (d) Turn ENGINE START STOP switch to ON.
- (e) Use diagnostic tester (the latest software) to reread DTC in EPB system.

Result

Proceed to
OK
NG

OK

System operates normally

NG

Replace ABS/ESP control module



DTC	C1807-98	Disc Over Heat
------------	-----------------	-----------------------

Caution:

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

1	Perform Active Test using diagnostic tester
----------	--

- (a) Clamp and release left and right rear wheel brake caliper.

Result

Proceed to
OK
NG

OK	End
-----------	------------

NG

2	Check caliper actuator motor
----------	-------------------------------------

- (a) Turn ENGINE START STOP switch to OFF.
 (b) Disconnect the negative battery cable.
 (c) Replace actuator and retest.

OK

Motor rotates normally

Result

Proceed to
OK
NG

NG	Replace parking brake actuator
-----------	---------------------------------------

OK

3	Reconfirm DTCs
----------	-----------------------

- (a) Turn ENGINE START STOP switch to ON.
 (b) Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
 (c) Turn ENGINE START STOP switch to OFF and wait several seconds.
 (d) Turn ENGINE START STOP switch to ON.
 (e) Use diagnostic tester (the latest software) to reread DTC in EPB system.

Result

Proceed to
OK
NG

OK	System operates normally
-----------	---------------------------------

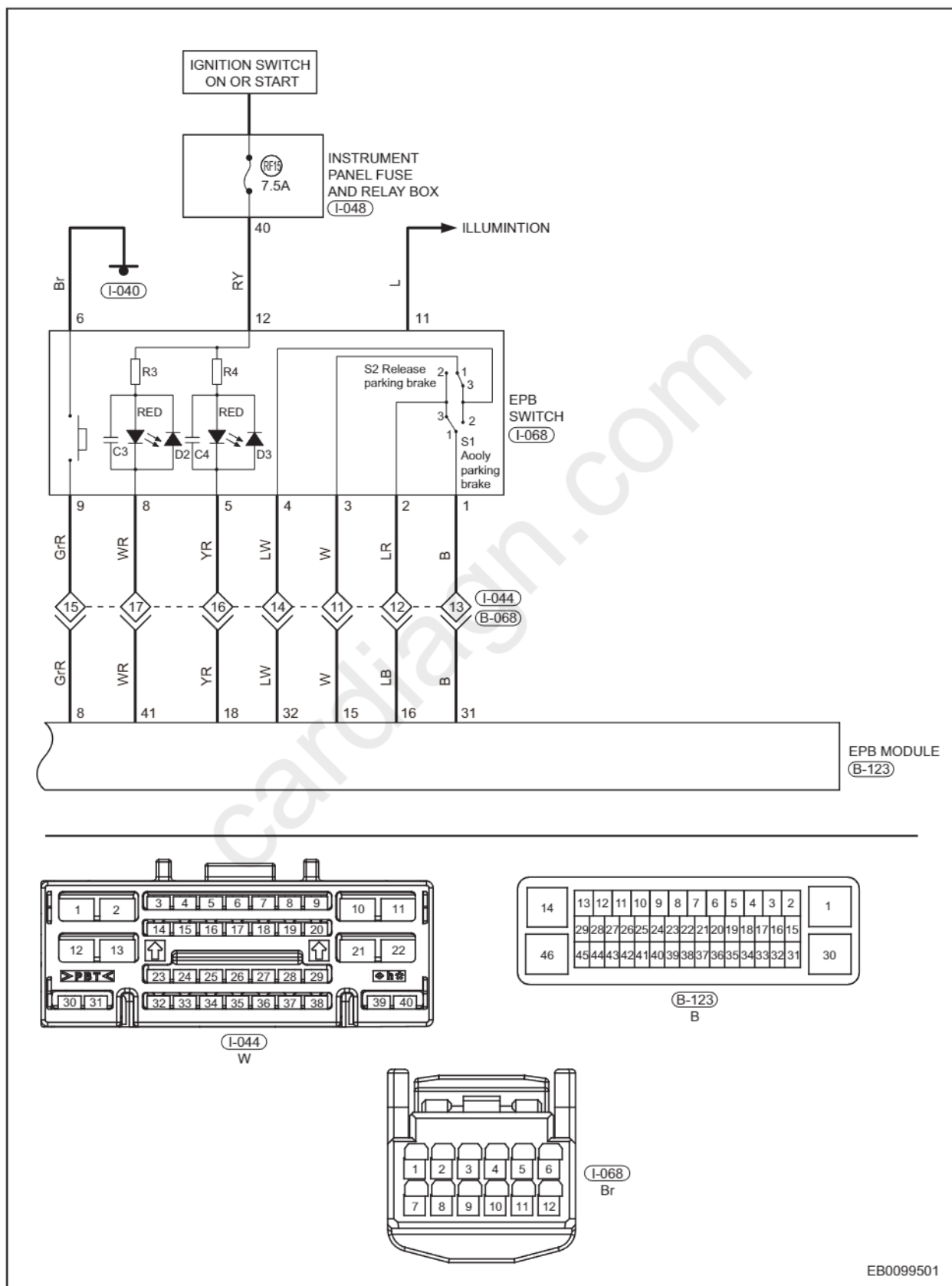
NG	Replace ABS/ESP control module
-----------	---------------------------------------

DTC

C1806-16

APB Button Under Voltage

Circuit Diagram



EB0099501



1 Check EPB switch

- (a) Refer to inspection of EPB switch

Result

Proceed to
OK
NG

NG**Replace EPB switch****OK****2 Check the battery**

- (a) Using a digital multimeter, measure voltage between positive battery terminal and negative battery terminal.
- (b) Battery voltage should be higher than 12 V.

Result

Proceed to
OK
NG

NG**Check charging system****OK****3 Check wire harness and connector for continuity**

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Disconnect the negative battery cable.
- (c) Disconnect the connector.
- (d) Using ohm band of multimeter, check for continuity between terminal 1 of I-068 and terminal 9 of I-044.

OK

Multimeter Connection	Condition	Specified Condition
I-068 (1) - I-044 (9)	Always	$\leq 1 \Omega$

- (e) Using ohm band of multimeter, check for continuity between terminal 9 of I-044 and terminal 31 of B-123.

OK

Multimeter Connection	Condition	Specified Condition
I-044 (9) - B-123 (31)	Always	$\leq 1 \Omega$

- (f) Using ohm band of multimeter, check for continuity between terminal 2 of I-068 and terminal 8 of I-044.

OK

Multimeter Connection	Condition	Specified Condition
I-068 (2) - I-044 (8)	Always	$\leq 1 \Omega$

- (g) Using ohm band of multimeter, check for continuity between terminal 8 of I-044 and terminal 16 of B-123.

OK

Multimeter Connection	Condition	Specified Condition
I-044 (8) - B-123 (16)	Always	$\leq 1 \Omega$

- (h) Using ohm band of multimeter, check for continuity between terminal 3 of I-068 and terminal 7 of I-044.

OK

Multimeter Connection	Condition	Specified Condition
I-068 (3) - I-044 (7)	Always	$\leq 1 \Omega$

- (i) Using ohm band of multimeter, check for continuity between terminal 7 of I-044 and terminal 15 of B-123.

OK

Multimeter Connection	Condition	Specified Condition
I-044 (7) - B-123 (15)	Always	$\leq 1 \Omega$

- (j) Using ohm band of multimeter, check for continuity between terminal 4 of I-068 and terminal 10 of I-044.

OK

Multimeter Connection	Condition	Specified Condition
I-068 (4) - I-044 (10)	Always	$\leq 1 \Omega$

- (k) Using ohm band of multimeter, check for continuity between terminal 10 of I-044 and terminal 32 of B-123.

OK

Multimeter Connection	Condition	Specified Condition
I-044 (10) - B-123 (32)	Always	$\leq 1 \Omega$

Result

Proceed to
OK
NG

NG

Repair or replace wire harness and connector between EPB switch and ABS/ESP control module assembly

OK

4 Reconfirm DTCs

- Turn ENGINE START STOP switch to ON.
- Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
- Turn ENGINE START STOP switch to OFF and wait several seconds.
- Turn ENGINE START STOP switch to ON.
- Use diagnostic tester (the latest software) to reread DTC in EPB system.

Result

Proceed to
OK



Proceed to	
NG	
OK	Same DTC is not output
NG	Replace ABS/ESP control module assembly

DTC**C1823-00****APB Motor Enable Line Violation****Caution:**

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

1**Check actuator connector**

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Disconnect the negative battery cable.
- (c) Disconnect actuator connector, check it for dirty, water, aging or loosening.

Result

Proceed to
OK
NG

NG

Install, clean or replace connector correctly and firmly

OK**2****Check wire harness and connector for continuity**

- (a) Turn ENGINE START STOP switch to OFF.
- (b) Disconnect the negative battery cable.
- (c) Check continuity of wire harness between ABS/ESP and actuator using resistance gear of multimeter.

Result

Proceed to
OK
NG

NG

Repair or replace wire harness and connector between actuator motor and ABS/ESP control module assembly

OK**3****Check actuator motor**

- (a) Disconnect the negative battery cable.
- (b) Turn ENGINE START STOP switch to OFF.
- (c) Replace actuator motor with a new one and retest.

Result

Proceed to
Next



Next

4	Reconfirm DTCs
---	----------------

- (a) Turn ENGINE START STOP switch to ON.
- (b) Use diagnostic tester (the latest software) to record and clear DTC stored in EPB system.
- (c) Turn ENGINE START STOP switch to OFF and wait several seconds.
- (d) Turn ENGINE START STOP switch to ON.
- (e) Use diagnostic tester (the latest software) to reread DTC in EPB system.

Result

Proceed to
OK
NG

OK	Same DTC is not output
NG	Replace actuator motor

ON-VEHICLE SERVICE

EPB System

On-vehicle Inspection

1. Inspect friction material thickness of brake discs on both sides visually, replace it when minimum value is less than 2 mm.
2. When brake disc is worn to limit state, there will be mechanical alarm, and the brake disc should be replaced.
3. It is necessary to replace 4 brake linings of left and right brake calipers when replacing brake linings.
4. If removed brake lining can be reused, it must be installed at original position when it is reinstalled.
5. During warranty period of brake lining, it is not possible to replace brake lining with different wear thickness. If friction material thickness is less than 2 mm in warranty period, brake lining should be replaced, and check brake caliper for dragging at the same time.
6. Check EPB wire harness for aging or damage, replace as necessary.

Warning:

- EPB system must be repaired by professional technicians who have trained and mastered maintenance skills and only use original parts for replacement.
- Before perform a fault diagnosis of EPB system, it is necessary to confirm that vehicle CAN interface can be connected properly.
- Note following when connecting EPB wire harness: Turn ENGINE START STOP switch off before disconnecting wire harness connector, make sure that connector is dry and clean and avoid any foreign material entering; Wire harness must be installed in place horizontally and vertically in order to avoid damaging connector.
- If EPB motor fuse need to be replaced, make sure that it is exactly the same with original model, including shape and parameters, and ensure that connection is fully in place.



Integrated Caliper Motor

Removal

Warning/Caution/Hint

Hint:

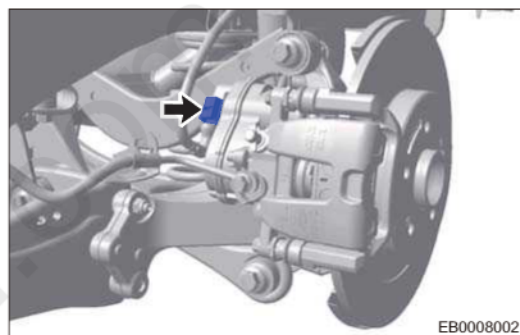
- Use same procedures for right and left sides.
- Procedures listed below are for left side.

Caution:

- Be sure to wear safety equipment to prevent accidents, when removing integrated caliper motor.
- Remove integrated caliper motor without damaging motor seal ring and replace it when necessary.
- When removing integrated caliper motor, do not allow foreign matter enter into motor.

1. Turn off all electrical equipment and the ENGINE START STOP switch.
2. Disconnect the negative battery cable for at least 30 seconds.
3. Remove the rear tires (See page 24-8).
4. Remove the integrated caliper motor.

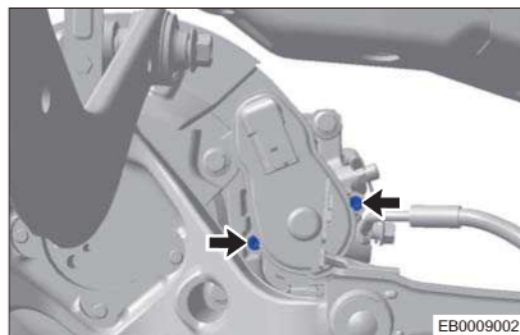
- (a) Disconnect the integrated caliper motor wire harness connector plug (arrow).



- (b) Remove the 2 fixing bolts (arrows) from left integrated caliper motor.

Tightening torque

$10 \pm 1.0 \text{ N}\cdot\text{m}$



- (c) Remove the integrated caliper motor (arrow).

Caution:

- Save the removed parking actuator properly to avoid dust or water polluting grease and seal rings.



EPB Brake Caliper Emergency Release

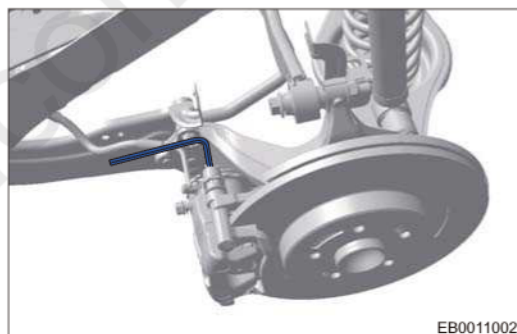
Warning/Caution/Hint

Hint:

- Use same procedures for right and left sides.
- Procedures listed below are for left side.

Caution:

- If parking brake cannot be released by parking brake switch manually or automatically due to unexpected circumstances (such as battery does not output voltage, parking brake system failure, etc.) during using EPB system, you need to enable parking emergency releasing function to release parking brake, please follow the following steps for specific methods:
 - If this malfunction occurs on a slope, please try to tow vehicle to a level road or place obstacles such as rocks in front of or rear of front wheels respectively to prevent wheel rolling, avoiding coasting accident after releasing rear wheel brake urgently.
 - Be sure to wear safety equipment to prevent accidents, when EPB brake caliper emergency releasing.
1. Remove the rear tires (See page 24-8).
 2. Remove the integrated caliper motor (See page 27-72).
 3. Using an inner hexagon wrench, rotate 2-3 cycles clockwise or stop until brake disc can rotate freely (it is normal that a large rotation force is needed due to vehicle parking brake condition).



4. The vehicle only loses parking function and does not affect normal braking function after releasing parking brake

Caution:

- Emergency release is highly specialized, it is recommend to perform by Chery 4S shop professionals.

Installation

1. Installation is in the reverse order of removal.

Caution:

- Be sure to wear safety equipment to prevent accidents, when installing integrated caliper motor.
- When installing integrated caliper motor, remove sediment, dust and other foreign objects that are on matching surface of parking actuator and on head of parking caliper.
- When installing integrated caliper motor, check whether the o-ring of parking caliper head is invalid or abnormal. Please replace it in time.
- When installing integrated caliper motor, parking caliper head and actuator motor must be tightly coupled, tighten fixing bolts to specified torque.
- When installing integrated caliper motor, check whether the o-ring seal is extruded between parking actuator and parking caliper, if it is extruded, should be reinstalled.
- When installing integrated caliper motor, manual parking clamp and release must be performed to confirm if parking function is normal.



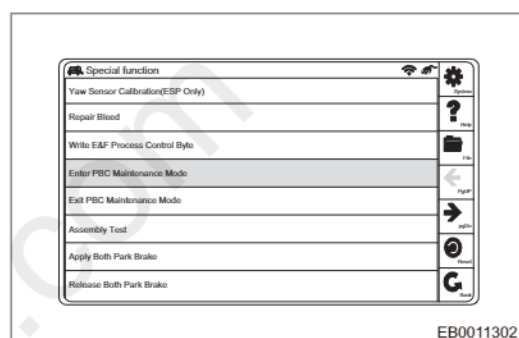
Rear Brake Lining

Removal

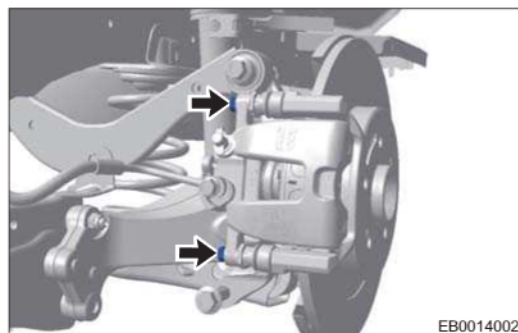
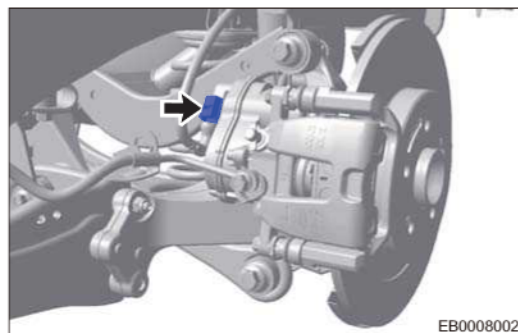
Warning/Caution/Hint

Caution:

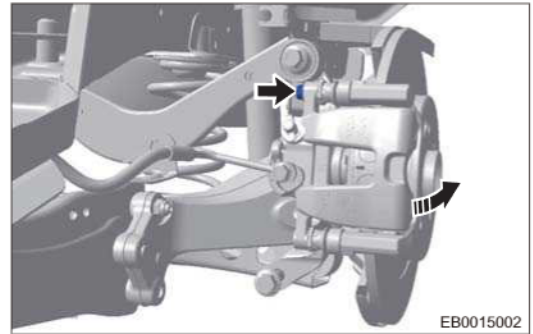
- When worn minimum value of brake lining is 2 mm, replace 4 brake linings of left and right brake calipers.
 - DO NOT perform "Exit Maintenance Mode" using diagnostic tester during vehicle maintenance.
 - After removing EPB caliper set, it is strictly forbidden to depress brake pedal, otherwise the piston will rush out of cylinder hole and the brake fluid will come out and pollute brake disc and other parts.
 - After completing replacement of new brake lining, make sure to perform "Exit Parking Brake Maintenance Mode" with diagnostic tester.
1. Connect diagnostic tester, turn ENGINE START STOP switch to ON.
 2. Perform "Enter PBC Maintenance Mode" operation using diagnostic tester.



3. Remove the rear brake lining.
 - (a) Disconnect the integrated caliper motor wire harness connector plug (arrow).
 - (b) Remove the lower fixing bolts (arrow) from single guide pin.



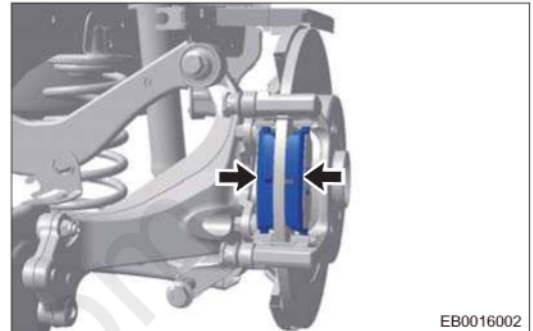
- (c) Flip the parking caliper around another guide pin (arrow) and use hook to lift the caliper.



- (d) Remove the brake linings (arrow) that need to be replaced.

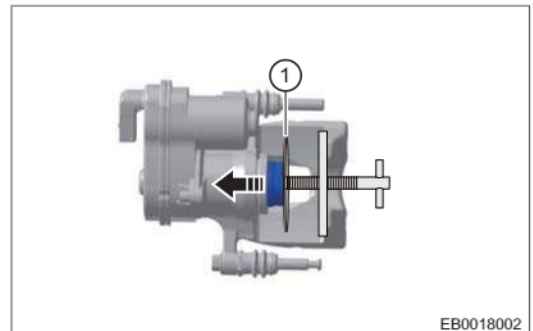
Caution:

- After removing EPB caliper set, it is strictly forbidden to depress brake pedal, otherwise the piston will rush out of cylinder hole and the brake fluid will come out and pollute brake disc and other parts.
- Move caliper equipped with spring diaphragm slowly during this process, spring may flick the brake lining and drop on the foot.

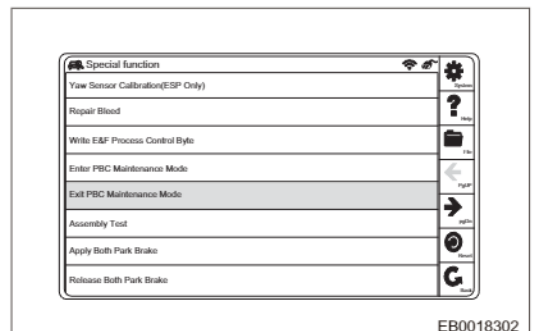


Installation

- (a) A thin sheet of steel (1) or old brake lining is added to the piston end to prevent damaging anti-rotating tooth of end surface.
- (b) Use special tool to press piston along the direction of hand as shown in figure to push piston back to bottom of cylinder hole.



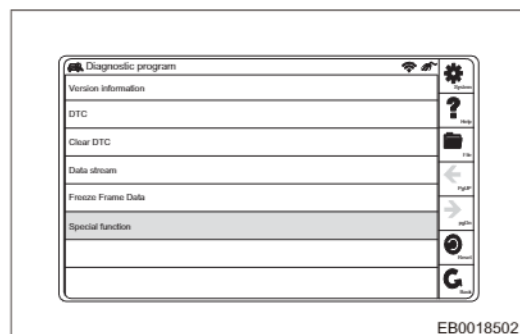
1. Install rear wheel brake lining.
2. Install brake caliper bolt in place.
3. Connect EPB connector and install wheel.
4. perform "Exit PBC Maintenance Mode" operation using diagnostic tester.



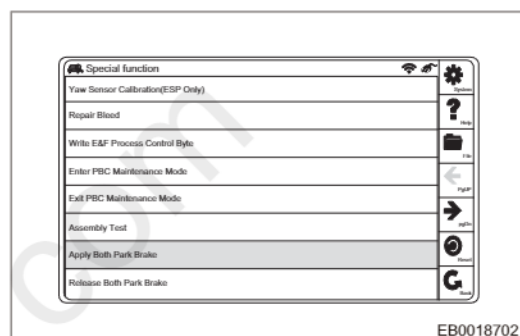
27-ELECTRONIC PARKING BRAKE SYSTEM

5. Perform simultaneous releasing of rear brake calipers and clamp test.

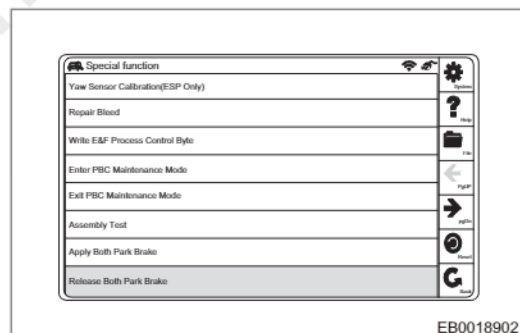
- (a) Turn ENGINE START STOP switch ON.
- (b) Connect the diagnostic tester.
- (c) Click diagnostic tester, enter "Special function".



- (d) Click "Apply Both Park Brake".

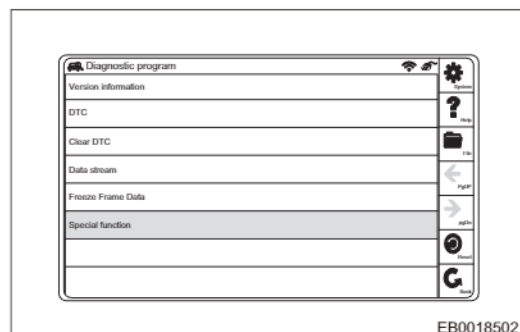


- (e) Click "Release Both Park Brake".

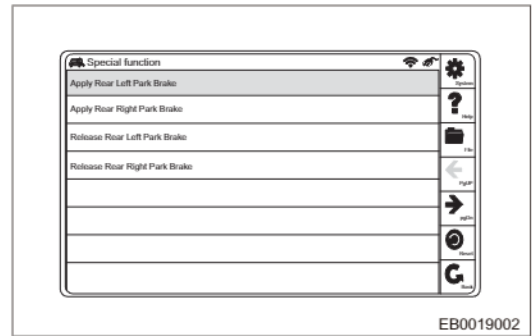


6. Perform simultaneous releasing of rear brake calipers and clamp test.

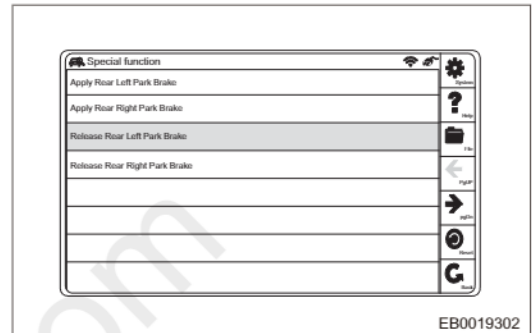
- (a) Turn ENGINE START STOP switch ON.
- (b) Connect the diagnostic tester.
- (c) Click diagnostic tester, enter "Special function".



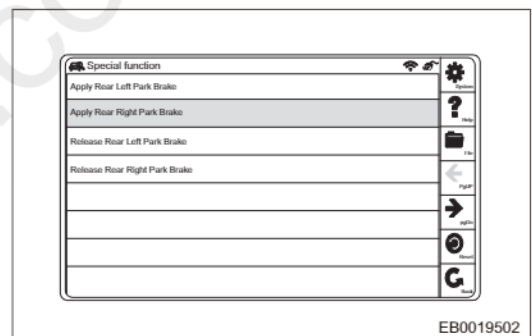
(d) Click "Apply Rear Left Park Brake".



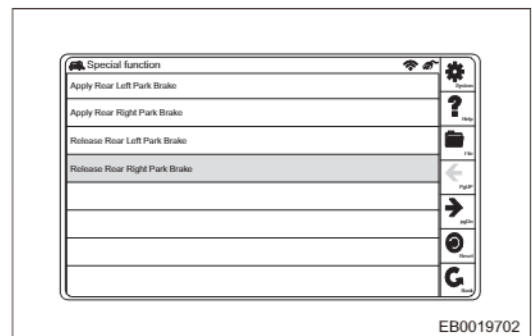
(e) Click "Release Rear Left Park Brake".



(f) Click "Apply Rear Right Park Brake".



(g) Click "Release Rear Right Park Brake".

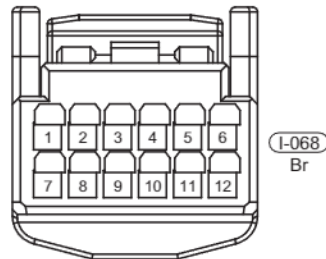
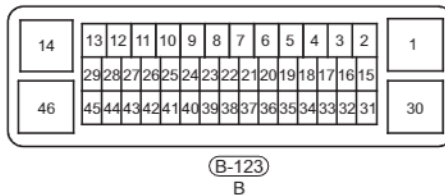
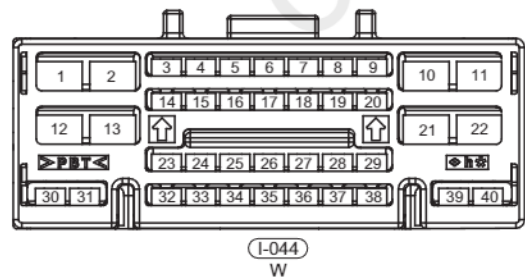
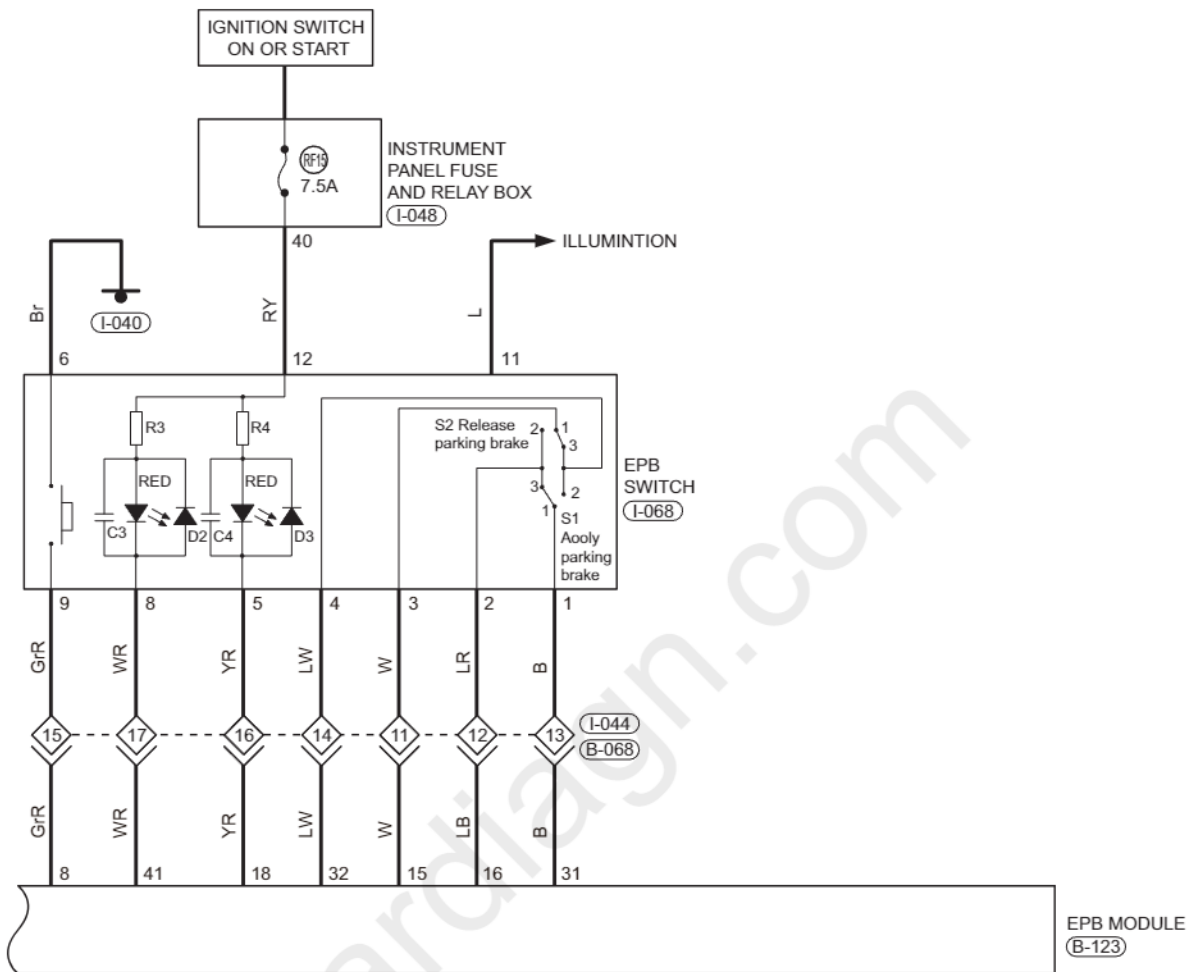


Caution:

- Be sure to wear safety equipment to prevent accidents, when installing rear brake linings.
- When replacing brake lining, check whether piston dust boot and guide pin dust boot is broken, and whether the spring plate is deformed or damaged, replace it when necessary.
- After completing replacement of new brake lining, make sure to perform "Exit Parking Brake Maintenance Mode" with diagnostic tester.
- After installing rear brake linings, two manual parking and release are carried out to make the brake lining fully in contact with the brake disc.
- All actions of the EPB action test should be in line with the actual operation, otherwise the EPB system should be overhauled.

EPB Switch

Inspection of EPB switch



1. Using ohm band of digital multimeter, measure internal resistance of EPB switch according to circuit diagram. If it does not match with measured value in table below, replace the EPB switch.

Multimeter Connection	Manual Parking Switch State	Specified Condition
Terminal 1 - Terminal 2	No action	$\leq 1 \Omega$
Terminal 3 - Terminal 4	No action	$\leq 1 \Omega$
Terminal 1 - Terminal 3 - Terminal 4	Pull hand brake	$\leq 1 \Omega$
Terminal 3 - Terminal 2 - Terminal 1	Release hand brake	$\leq 1 \Omega$

Multimeter Connection	Automatic Parking Switch State	Specified Condition
Terminal 6 - Terminal 8	Not pressed	∞
Terminal 6 - Terminal 8	Pressed	$\leq 1 \Omega$

Multimeter Connection	Indicator Light	Specified Condition
Terminal 12 - Terminal 5	Manual parking switch indicator light	2.2 k Ω
Terminal 12 - Terminal 9	Automatic parking switch indicator light	2.2 k Ω



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