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PARKING BRAKE AND ACTUATION

PARKING BRAKE (G967759)

OVERVIEW

Please note this is a sealed unit and no attempt must be made to open the actuator as it will invalidate the warranty claim.

For information on the operation of the system. REFER to: [Parking Brake](#) (206-05 Parking Brake and Actuation, Description and Operation).

INSPECTION AND VERIFICATION

1. Verify the customer concern.
2. Visually inspect for obvious mechanical or electrical faults.

Visual Inspection

MECHANICAL	ELECTRICAL
<ul style="list-style-type: none"> ■ Parking brake cable(s) condition and fitment ■ Parking brake shoes condition and fitment ■ Parking brake drums (integrated into rear brake discs) ■ Parking brake actuator module condition and fitment 	<ul style="list-style-type: none"> ■ Parking brake indicators ■ Fuses <ul style="list-style-type: none"> ■ Fuse box - engine compartment - fuse 11E ■ Fuse box - engine compartment - fuse 8E ■ Fuse box - passenger compartment - fuse 40P ■ Fuse box - passenger compartment - fuse 41P ■ Wiring harness/electrical connectors <ul style="list-style-type: none"> ■ Check for bent/corroded pins ■ Controller area network (CAN) circuits ■ Parking brake switch ■ Parking brake actuator module

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. Use the approved diagnostic system or a scan tool to retrieve any DTCs before moving onto the symptom chart or DTC index.
 - Make sure that all DTCs are cleared following rectification.

SYMPTOM CHART

SYMPTOM	POSSIBLE CAUSES	ACTION
<p>Parking brake will not engage or release</p> <p>Low parking brake efficiency /parking brake sticking /binding</p>	<ul style="list-style-type: none"> ■ Parking brake cables fouled, trapped or damaged ■ Parking brake cables incorrectly routed or fixed ■ Parking brake shoes, linings worn /contaminated ■ Parking brake drums (integrated into rear brake discs) ■ Parking brake shoes incorrectly adjusted following replacement ■ Parking brake actuator module malfunction 	<p>Check the parking brake cables for fouling, trapping or damage. Check the cables for correct routing. Check that the cable end fitting connector(s) are correctly fitted to the operating lever(s). Inspect the parking brake shoes and drums for condition/wear/contamination, REFER to: Brake Disc (206-04 Rear Disc Brake, Removal and Installation) / Parking Brake Shoes (206-05 Parking Brake and Actuation, Removal and Installation). Check the parking brake shoes for correct adjustment. REFER to: Parking Brake Shoe and Lining Adjustment (206-05 Parking Brake and Actuation, General Procedures). Check the operation of the parking brake actuator module, check for damage and/or excessive noise during operation. Check for parking brake actuator module DTCs.</p>

DTC INDEX



NOTE:

Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

DTC	DESCRIPTION	POSSIBLE CAUSES	ACTION
C110468	Brake bedding-in mode	<ul style="list-style-type: none"> ■ Event information 	<p>This is not a fault. This is where the parking brake bedding-in mode has been activated. For information on how the bedding-in mode is activated and deactivated, REFER to: Parking Brake Shoes Bedding-In (206-05 Parking Brake and Actuation, General Procedures).</p>

DTC	DESCRIPTION	POSSIBLE CAUSES	ACTION
C1A0000	Control module failure	<ul style="list-style-type: none"> ■ Parking brake actuator module fault 	Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table. Refer to the warranty policy and procedures manual if a module is suspect.
C1A0016	Parking brake actuator module, voltage low	<ul style="list-style-type: none"> ■ Battery voltage below 8.3V at parking brake actuator module ■ Charging system under charging ■ Parking brake actuator module supply circuit: short circuit to ground ■ Parking brake actuator module supply circuit: open circuit ■ Parking brake actuator module ground circuit: short circuit to power ■ Parking brake actuator module ground circuit: open circuit 	Check the charging system, charging voltage and battery condition. Check the parking brake actuator power and ground circuits. Refer to the electrical guides. Clear DTCs, complete drive cycle 3 to test for normal operation, refer to the relevant drive cycle shown below this table.
C1A0017	Parking brake actuator module, voltage high	<ul style="list-style-type: none"> ■ Vehicle started using a booster pack ■ Battery voltage at parking brake actuator module has been greater than 17V ■ Charging system over charging ■ Parking brake actuator module supply circuit: short circuit to power 	Check the charging system and charging voltage. Check the parking brake actuator power circuits. Refer to the electrical guides. Clear DTCs, complete drive cycle 3 to test for normal operation, refer to the relevant drive cycle shown below this table.
C1A004B	Control module	<div style="border: 1px solid black; background-color: #e0f2f1; padding: 5px; margin-bottom: 10px;">  NOTE: This is not a fault. </div> <ul style="list-style-type: none"> ■ Parking brake actuator module temperature protection invoked, typically due to overuse where there have been more than 15 apply and release cycles continuously 	If the red parking brake warning indicator flashes the fault is the result of short term protection (message displayed). Allow the parking brake to cool for 60 seconds and retest for functionality. If the parking brake does not apply, check for other DTCs. Rectify as necessary. Clear DTCs, complete drive cycle 3 to test for normal operation, refer to the relevant drive cycle shown below this table.
C1A4001	Longitudinal acceleration sensor - general electrical failure	<div style="border: 1px solid black; background-color: #e0f2f1; padding: 5px; margin-bottom: 10px;">  NOTE: The longitudinal acceleration sensor is part of </div>	Clear DTCs and check if the fault reoccurs when the vehicle is stationary. Refer to the warranty policy and procedures manual if a module is suspect. Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table.

DTC	DESCRIPTION	POSSIBLE CAUSES	ACTION
		<p data-bbox="485 170 735 259">the parking brake actuator module</p> <ul data-bbox="491 304 715 394" style="list-style-type: none"> Longitudinal acceleration sensor fault 	
C1A4002	Longitudinal acceleration sensor - general signal failure	<p data-bbox="485 472 735 712">  NOTE: The longitudinal acceleration sensor is part of the parking brake actuator module </p> <ul data-bbox="491 757 715 846" style="list-style-type: none"> Longitudinal acceleration sensor plausibility failure 	Clear DTCs and check if the fault reoccurs when the vehicle is stationary. Calibrate the longitudinal acceleration sensor. To calibrate the sensor make sure the vehicle is on a level surface and run the calibration routine from the configuration menu of the approved diagnostic system. If calibration was not successful check that the parking brake actuator module is correctly installed. Refer to the warranty policy and procedures manual if a module is suspect. Clear DTCs, complete drive cycle 2 to test for normal operation, refer to the relevant drive cycle shown below this table.
C1A4054	Longitudinal acceleration sensor - missing calibration	<p data-bbox="485 925 735 1164">  NOTE: The longitudinal acceleration sensor is part of the parking brake actuator module </p> <ul data-bbox="491 1209 715 1299" style="list-style-type: none"> Longitudinal acceleration sensor not calibrated 	Clear DTCs and calibrate the longitudinal acceleration sensor. To calibrate the sensor make sure the vehicle is on a level surface and run the calibration routine from the configuration menu of the approved diagnostic system. Retest for functionality. Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table.
C1A4101	Clutch pedal sensor circuit - general electrical failure	<ul data-bbox="491 1377 730 1736" style="list-style-type: none"> Clutch pedal sensor circuit : open circuit Clutch pedal sensor circuit: short circuit to ground Clutch pedal sensor circuit: short circuit to power Clutch pedal sensor fault 	Check the clutch pedal sensor and circuits. Refer to the electrical guides. Install a new clutch pedal sensor as necessary. Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table.
C1A4102	Clutch pedal sensor circuit - general signal failure	<ul data-bbox="491 1814 730 2083" style="list-style-type: none"> Clutch pedal sensor circuit : open circuit Clutch pedal sensor circuit: short circuit to ground Clutch pedal sensor circuit: short circuit to power 	Check the clutch pedal sensor and circuits. Refer to the electrical guides. Install a new clutch pedal sensor as necessary. Clear DTCs, complete drive cycle 2 to test for normal operation, refer to the relevant drive cycle shown below this table.

DTC	DESCRIPTION	POSSIBLE CAUSES	ACTION
		<ul style="list-style-type: none"> Clutch pedal sensor fault 	
C1A4300	Motor supply circuit	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">  NOTE: The electric motor is part of the parking brake actuator module </div> <ul style="list-style-type: none"> Brake cables loose /broken/damaged Brake shoes worn /damaged Electric motor jammed 	Check that the brake cables are connected correctly and are not loose /damaged. If the cables need to be re-connected use the approved diagnostic system to drive the cables to the "mount" position so that maximum cable length is available. Check the parking brake shoes adjustment and condition, REFER to: Parking Brake Shoe and Lining Adjustment (206-05 Parking Brake and Actuation, General Procedures) / Brake Disc (206-04 Rear Disc Brake, Removal and Installation) / Parking Brake Shoes (206-05 Parking Brake and Actuation, Removal and Installation). If the parking brake actuator module is stuck, re-cycle the ignition. If the parking brake actuator module cannot be operated from the switch then use the approved diagnostic system to drive the parking brake actuator module using the "unjam" application in the set-up and configuration menu. Retest for functionality. Refer to the warranty policy and procedures manual if a module is suspect. Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table.
C1A4301	Motor supply circuit	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">  NOTE: The electric motor is part of the parking brake actuator module </div> <ul style="list-style-type: none"> Internal motor circuit fault 	Clear DTCs, complete drive cycle 3 to test for normal operation, refer to the relevant drive cycle shown below this table. Refer to the warranty policy and procedures manual if a module is suspect.
C1A4662	Parking brake actuator module plausibility check	<ul style="list-style-type: none"> Parking brake cables fouled, trapped or damaged Parking brake shoes, linings worn Parking brake shoes incorrectly adjusted following replacement Parking brake actuator module circuit(s): short circuit to ground, short circuit to power, high resistance Parking brake actuator module fault 	Check the parking brake cables for fouling, trapping or damage. Check the parking brake shoes for correct adjustment, REFER to: Parking Brake Shoe and Lining Adjustment (206-05 Parking Brake and Actuation, General Procedures). Inspect the parking brake shoes for excessive wear. REFER to: Brake Disc (206-04 Rear Disc Brake, Removal and Installation) / Parking Brake Shoes (206-05 Parking Brake and Actuation, Removal and Installation). Check the parking brake actuator module circuits. Refer to the electrical guides. Refer to the warranty policy and procedures manual if a module is suspect.
C1A4701	Force sensor - general electrical failure	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">  NOTE: The force sensor is part of the parking brake actuator module </div>	Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table. Refer to the warranty policy and procedures manual if a module is suspect.

DTC	DESCRIPTION	POSSIBLE CAUSES	ACTION
		<ul style="list-style-type: none"> Internal force sensor electrical fault 	
C1A4702	Force sensor - general signal failure	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">  NOTE: The force sensor is part of the parking brake actuator module </div> <ul style="list-style-type: none"> Internal force sensor plausibility failure 	Clear DTCs, complete drive cycle 3 to test for normal operation, refer to the relevant drive cycle shown below this table. Refer to the warranty policy and procedures manual if a module is suspect.
C1A4754	Force sensor - missing calibration	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">  NOTE: The force sensor is part of the parking brake actuator module </div> <ul style="list-style-type: none"> Internal force sensor not calibrated 	Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table. Refer to the warranty policy and procedures manual if a module is suspect.
C1A4801	Warning lamp circuit - general electrical failure	<ul style="list-style-type: none"> Parking brake actuator module to instrument cluster warning lamp circuit: open circuit Parking brake actuator module to instrument cluster warning lamp circuit: short circuit to ground Parking brake actuator module to instrument cluster warning lamp circuit: short circuit to power Parking brake actuator module fault Instrument cluster fault 	Check the parking brake actuator module to instrument cluster warning lamp circuit. Refer to the electrical guides. Rectify as necessary. Refer to the warranty policy and procedures manual if a module is suspect. Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table.
C1A5368	Manual emergency release activated - automatic parking brake actuator module cable re-engagement (latching) failed,	<ul style="list-style-type: none"> Emergency release cable activated and stuck/damaged Parking brake cables seized/damaged Actuator jammed 	Check that the emergency release cable is not permanently pulled (or stuck). Check the parking brake cables for broken or loose connections. Attempt to re-engage the parking brake by pulling the apply switch TWICE. Clear DTCs, complete the following drive cycle. Pull the parking brake emergency release cable. Pull the parking brake switch to the apply position, hold until the parking brake motor has stopped (this may take up to 20 seconds). Release the switch to idle position. For parking brake actuator module manual emergency release REFER to: Parking Brake (206-05 Parking Brake and Actuation, Description and Operation).

DTC	DESCRIPTION	POSSIBLE CAUSES	ACTION
C1A5564	Ignition switch input circuit - signal plausibility failure	<ul style="list-style-type: none"> ■ Parking brake actuator module ignition supply circuits: short circuit to ground, short circuit to power, high resistance ■ Parking brake actuator module key in supply circuit: short circuit to ground, short circuit to power, high resistance ■ Ignition switch fault 	Check the parking brake actuator module ignition and key in circuits. Refer to the electrical guides. Rectify as necessary. Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table.
U007388	Parking brake actuator module communication bus off	<ul style="list-style-type: none"> ■ Controller area network (CAN) circuit: open circuit ■ CAN circuit: short circuit to each other ■ CAN circuit: short circuit to power ■ CAN circuit: short circuit to earth ■ Parking brake actuator module fault 	Carry out a complete vehicle read for DTCs indicating a CAN or module fault. Check the CAN circuits. Rectify as necessary. Refer to the warranty policy and procedures manual if a module is suspect. Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table.
U010087	Lost communication with engine control module (ECM) - missing message	<ul style="list-style-type: none"> ■ Invalid data transmitted by ECM ■ Controller area network (CAN) circuit: open circuit ■ CAN circuit: short circuit to each other ■ CAN circuit: short circuit to power ■ CAN circuit: short circuit to earth ■ ECM fault ■ CAN control module fault 	Carry out a complete vehicle read for DTCs indicating a CAN or module fault. Lost communication codes indicate that a module is not receiving CAN information from another module, but that its own transmissions are OK. Check for related "invalid data" DTCs in other modules and other ECM DTCs. Rectify as necessary. Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table. If DTC resets carry out a network integrity test. Review the DTCs to identify any trends such as a number of modules reporting having lost communication with a particular module. Rectify as necessary. This DTC may occur after /during cranking if battery capacity is low. Refer to the warranty policy and procedures manual if a module is suspect. Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table.
U010187	Lost communication with transmission control module (TCM) or transfer box control module - missing message	<ul style="list-style-type: none"> ■ Invalid data transmitted by TCM ■ Invalid data transmitted by transfer box control module ■ Controller area network (CAN) circuit: open circuit ■ CAN circuit: short circuit to each other 	Carry out a complete vehicle read for DTCs indicating a CAN or module fault. Lost communication codes indicate that a module is not receiving CAN information from another module, but that its own transmissions are OK. Check for related "invalid data" DTCs in other modules and other ECM DTCs. Rectify as necessary. Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table. If DTC is still present after clear down carry out a network integrity test. Review the DTCs to identify any trends such as a number of modules reporting having lost communication with a particular module. Rectify as necessary. This DTC may occur after/during cranking if battery capacity is low. Refer to

DTC	DESCRIPTION	POSSIBLE CAUSES	ACTION
		<ul style="list-style-type: none"> ■ CAN circuit: short circuit to power ■ CAN circuit: short circuit to earth ■ TCM fault ■ Transfer box control module fault ■ CAN control module fault 	<p>the warranty policy and procedures manual if a module is suspect. Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table.</p>
U012287	Lost communication with vehicle dynamics control module - missing message	<ul style="list-style-type: none"> ■ Invalid data transmitted by vehicle dynamics control module ■ Controller area network (CAN) circuit: open circuit ■ CAN circuit: short circuit to each other ■ CAN circuit: short circuit to power ■ CAN circuit: short circuit to earth ■ Vehicle dynamics control module fault ■ CAN control module fault 	<p>Carry out a complete vehicle read for DTCs indicating a CAN or module fault. Lost communication codes indicate that a module is not receiving CAN information from another module, but that its own transmissions are OK. Check for related "invalid data" DTCs in other modules and other dynamic control module DTCs. Rectify as necessary. Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table. If DTC resets carry out a network integrity test. Review the DTCs to identify any trends such as a number of modules reporting having lost communication with a particular module. Rectify as necessary. This DTC may occur after/during cranking if battery capacity is low. Refer to the warranty policy and procedures manual if a module is suspect. Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table.</p>
U015587	Lost communication with instrument cluster - missing message	<ul style="list-style-type: none"> ■ Invalid data transmitted by instrument cluster ■ Controller area network (CAN) circuit: open circuit ■ CAN circuit: short circuit to each other ■ CAN circuit: short circuit to power ■ Instrument cluster fault ■ CAN control module fault 	<p>Carry out a complete vehicle read for DTCs indicating a CAN or module fault. Lost communication codes indicate that a module is not receiving CAN information from another module, but that its own transmissions are OK. Check for related "invalid data" DTCs in other modules and other instrument cluster DTCs. Rectify as necessary. Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table. If DTC resets carry out a network integrity test. Review the DTCs to identify any trends such as a number of modules reporting having lost communication with a particular module. Rectify as necessary. This DTC may occur after /during cranking if battery capacity is low. Refer to the warranty policy and procedures manual if a module is suspect. Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table.</p>
U030055	Internal control module software incompatibility	<ul style="list-style-type: none"> ■ Parking brake module configuration does not match vehicle configuration ■ Parking brake actuator module fault 	<p>Check that the correct module is fitted to the vehicle. Check that the car configuration file (CCF) is being used. Reprogramme (CCF) as necessary.</p>
U1A0300	Vehicle		<p>Check for other communication/invalid data DTC's. Rectify as</p>

DTC	DESCRIPTION	POSSIBLE CAUSES	ACTION
	configuration parameter	<ul style="list-style-type: none"> ■ Parking brake module configuration does not match vehicle configuration ■ Wrong vehicle car configuration file (CCF) 	necessary. Check that the correct module is fitted to the vehicle. Check if the correct car configuration file (CCF) is being used. Reprogramme (CCF) as necessary. Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table.
U1A1449	Controller area network (CAN) initialization failure	<ul style="list-style-type: none"> ■ Parking brake actuator module fault 	Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table. Refer to the warranty policy and procedures manual if a module is suspect.
U200201	Parking brake switch	<ul style="list-style-type: none"> ■ Parking brake switch circuit(s): open circuit ■ Parking brake switch circuit(s): short circuit to ground ■ Parking brake switch circuit(s): short circuit to power ■ Parking brake switch circuit(s): short circuit to each other ■ Parking brake switch fault 	Note that this DTC can be set by very slow operation of the parking brake switch. Check the parking brake switch and circuits. With the parking brake switch connected the following resistance should be measured at the parking brake actuator module end: (between 2584 ohms and 2636 ohms) between C2178-B3 & C2178-C4 and (between 2584 ohms and 2636 ohms) between C2178-B4 & C2178-C3. Refer to the electrical guides. Install a new parking brake switch as necessary. Clear DTCs, complete drive cycle 1 to test for normal operation, refer to the relevant drive cycle shown below this table.

Drive Cycle 1 Description

- Ignition On
- Make sure that no parking brake activation (diagnostic command or switch input) is attempted for a minimum of 3 seconds
- Retest for functionality

Drive Cycle 2 Description

- Ignition On
- Drive vehicle at a constant speed of 20kph (13mph) or slightly above in 2nd gear
- At a constant speed of 20kph (13mph) or slightly above apply the parking brake via the parking brake switch
- Press the brake pedal

Drive Cycle 3 Description

- Ignition On
- Make sure that the vehicle is stationary and that the parking brake is released

- Pull the parking brake switch to the apply position and hold in this position until the parking brake motor has stopped (this may take up to 5 seconds)
- Release the parking brake switch to the idle position, leave in the idle position for 2 seconds
- Push the parking brake switch to the release position (with foot on the brake pedal) and keep in this position until the parking brake motor has stopped (this may take up to 5 seconds)
- Release the parking brake switch to the idle position

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