

ANTI-LOCK CONTROL - TRACTION CONTROL

DIAGNOSIS AND TESTING

INSPECTION AND VERIFICATION

⚠ CAUTION:

Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault and may also cause additional faults in the vehicle being checked and/or the donor vehicle.

⚠ NOTES:

- If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component.
- Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

1. Verify the customer concern.

2. Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection

MECHANICAL	ELECTRICAL
<ul style="list-style-type: none">▪ Tire size, condition and installation▪ Wheel speed sensor condition and installation▪ Steering Angle Sensor (SAS) condition and installation▪ Yaw rate sensor and accelerometer condition and installation	<ul style="list-style-type: none">▪ Fuses▪ Harnesses and connectors▪ Warning lamp operation▪ Wheel speed sensors

<ul style="list-style-type: none"> Hydraulic control unit (with attached ABS module) condition and installation 	<ul style="list-style-type: none"> Central junction box HDC switch DSC switch Combined stop lamp switch / brake switch Yaw rate sensor and accelerometer Steering Angle Sensor (SAS) Anti-lock Braking (ABS) module Controller Area Network (CAN) circuits
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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. If the cause is not visually evident, check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index.

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
C1105-67	Brake lamp control signal incorrect after event - signal incorrect after event	<p>NOTE:</p> <p>The stoplamp-switch contains the brake-lamp - switch (BLS) and the brake-switch (BS) these are located within the same housing</p> <ul style="list-style-type: none"> The BLS circuit and the BS circuit have failed the plausibility test Switch internal fault Circuit fault 	<p>NOTE:</p> <p>Check for correct operation of the stop-lamps</p> <ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the ABS module circuit to the hill decent relay for fault

C1109-24	Vehicle dynamics control switch - signal stuck high	<ul style="list-style-type: none"> ▪ Switch internal fault ▪ Circuit short to power 	<div style="background-color: #e0f2f1; padding: 5px; border: 1px solid #ccc;"> <p> NOTE:</p> </div> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 5px;"> <p>This DTC may be logged if the switch state is active for over 1 minute</p> </div> <ul style="list-style-type: none"> ▪ Check for correct switch operation. Refer to the electrical circuit diagrams and check the ABS module circuit to the centre facia switch pack / DSC switch for circuit short to power
C1A00-16	Control module - circuit voltage below threshold	<ul style="list-style-type: none"> ▪ Low voltage detected ▪ Circuit short to ground, open circuit or high resistance 	<div style="background-color: #e0f2f1; padding: 5px; border: 1px solid #ccc;"> <p> NOTE:</p> </div> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 5px;"> <p>DTC may be stored due to a vehicle charging or starting fault</p> </div> <ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system check other modules for related DTCs. Check for correct vehicle battery / charging system operation. Refer to the electrical circuit diagrams and check the ABS module power (UZ) and ground circuit for fault
C1A00-17	Control module - circuit voltage above threshold	<ul style="list-style-type: none"> ▪ Voltage detected above preset maximum 	<div style="background-color: #e0f2f1; padding: 5px; border: 1px solid #ccc;"> <p> NOTE:</p> </div> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 5px;"> <p>DTC may be stored due to battery charger use or vehicle charging fault</p> </div> <ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system check other modules for related DTCs. Check for correct vehicle battery and charging system operation
C1A00-1C	Control module - circuit voltage out of range	<ul style="list-style-type: none"> ▪ Momentary low voltage detected 	<div style="background-color: #e0f2f1; padding: 5px; border: 1px solid #ccc;"> <p> NOTE:</p> </div> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 5px;"> <p>DTC may be stored due to a vehicle charging or starting fault</p> </div> <ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system check other modules for related DTCs. Check for correct vehicle charging system operation. Refer to the electrical circuit diagrams and check the ABS module power (UZ) and ground circuit for fault

C1A00-45	Control module - program memory failure	<ul style="list-style-type: none"> Module internal fault 	<ul style="list-style-type: none"> Using the manufacturer approved diagnostic system. Clear the DTC and retest if the DTC returns suspect the ABS module. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A00-46	Control module - calibration / parameter memory failure	<ul style="list-style-type: none"> Incorrect car configuration file (CCF) data received from IPC or CCF incorrectly configured Module installed to unrecognized vehicle configuration Module calibration /parameter memory failure (internal error) 	Configure the module using the approved diagnostic system. Clear the DTC and check if the DTC resets after ignition reset following >10 seconds ignition on. If the possible causes listed have been checked and the DTC persists, suspect the ABS module. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A00-49	Control module - internal electronic failure	<ul style="list-style-type: none"> Module internal fault 	<ul style="list-style-type: none"> Using the manufacturer approved diagnostic system, clear the DTC and retest. If the DTC returns, suspect the ABS module. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A00-4A	Control module - incorrect component installed	<ul style="list-style-type: none"> The stored vehicle variant code in the control module (EEPROM) does not match the variant code received via the CAN bus 	<ul style="list-style-type: none"> Using the manufacturer approved diagnostic system, confirm that the stored vehicle variant code and the transmitted variant code match. Configure as required
C1A00-4B	Control module - over temperature	<ul style="list-style-type: none"> The control module has exceeded a preset maximum temperature Module internal fault 	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p> NOTE:</p> <p>Investigate the cause of the control module temperature event</p> </div> <ul style="list-style-type: none"> Using the manufacturer approved diagnostic system, clear the DTC and retest. If DTC returns suspect an internal fault with the ABS module. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A00-68	Control module - event information	<ul style="list-style-type: none"> Control module event information 	Using the manufacturer approved diagnostic system, check for DTCs relating to a defective steering angle sensor, wheel speed sensor or yaw rate sensor. Replace as required. Refer to the new module / component installation note at the top of the DTC index

C1A00-88	Control module - bus off	<ul style="list-style-type: none"> ▪ CAN bus circuit fault 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system, carry out the CAN network integrity test. Refer to the electrical circuit diagrams and check the CAN bus circuit to the ABS module for circuit short to power, short to ground, open circuit or high resistance
C1A76-01	Valve relay circuit - general electrical failure	<ul style="list-style-type: none"> ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system, clear the DTC and retest. If DTC returns suspect an internal fault with the ABS module. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A76-04	Valve relay circuit - system internal failures	<ul style="list-style-type: none"> ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system, clear the DTC and retest. If DTC returns suspect an internal fault with the ABS module. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A77-16	Valve relay circuit - circuit voltage below threshold	<ul style="list-style-type: none"> ▪ Low voltage detected ▪ Circuit fault 	<div style="border: 1px solid black; background-color: #e0f2f1; padding: 5px; margin-bottom: 10px;"> <p> NOTE:</p> <p>DTC may be stored due to a vehicle charging or starting fault</p> </div> <ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system, check other modules for related DTCs. Check for correct vehicle charging system operation. Refer to the electrical circuit diagrams and check the ABS module (UBVR) power and ground circuits for fault
C1A78-04	Front left inlet valve - system internal failures	<ul style="list-style-type: none"> ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system, clear the DTC and retest. If the DTC returns suspect the ABS module. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A79-04	Front left outlet valve - system internal failures	<ul style="list-style-type: none"> ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system, clear the DTC and retest. If the DTC returns suspect the ABS module. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A80-	Front right	<ul style="list-style-type: none"> ▪ Module internal fault 	

04	inlet valve - system internal failures		<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system, clear the DTC and retest. If the DTC returns suspect the ABS module. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A81-04	Front right outlet valve - system internal failures	<ul style="list-style-type: none"> ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system, clear the DTC and retest. If the DTC returns suspect the ABS module. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A82-04	Rear left inlet valve - system internal failures	<ul style="list-style-type: none"> ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system, clear the DTC and retest. If the DTC returns suspect the ABS module. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A83-04	Rear left outlet valve - system internal failures	<ul style="list-style-type: none"> ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system, clear the DTC and retest. If the DTC returns suspect the ABS module. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A84-04	Rear right inlet valve - system internal failures	<ul style="list-style-type: none"> ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system, clear the DTC and retest. If the DTC returns suspect the ABS module. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A85-04	Rear right outlet valve - system internal failures	<ul style="list-style-type: none"> ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system, clear the DTC and retest. If the DTC returns suspect the ABS module. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A86-04	Commutation valve #1 - system internal failures	<ul style="list-style-type: none"> ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system, clear the DTC and retest. If the DTC returns suspect the ABS module. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A87-	Commutation	<ul style="list-style-type: none"> ▪ Module internal fault 	

04	valve #2 - system internal failures		<ul style="list-style-type: none"> Using the manufacturer approved diagnostic system, clear the DTC and retest. If the DTC returns suspect the ABS module. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A88-04	High pressure switching valve #1 - system internal failures	<ul style="list-style-type: none"> Module internal fault 	<ul style="list-style-type: none"> Using the manufacturer approved diagnostic system, clear the DTC and retest. If the DTC returns suspect the ABS module. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A89-04	High pressure switching valve #2 - system internal failures	<ul style="list-style-type: none"> Module internal fault 	<ul style="list-style-type: none"> Using the manufacturer approved diagnostic system, clear the DTC and retest. If the DTC returns suspect the ABS module. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A90-12	Wheel speed sensor supply circuit - circuit short to battery	<ul style="list-style-type: none"> Wheel speed sensor supply circuit short to power 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the wheel speed sensor supply (DP) circuit from the ABS module for short to power
C1A91-13	Front left wheel speed sensor circuit - circuit open	<ul style="list-style-type: none"> Open circuit fault Sensor internal failure Module internal fault 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the circuit between the ABS module and the front left wheel speed sensor for open circuit
C1A91-25	Front left wheel speed sensor circuit - signal shape / waveform failure	<ul style="list-style-type: none"> Circuit fault Sensor internal failure Module internal fault 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the circuit between the ABS module and the front left wheel speed sensor for fault
C1A91-2F	Front left wheel speed sensor circuit - signal erratic	<ul style="list-style-type: none"> Circuit fault Sensor internal failure Module internal fault 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the circuit between the ABS module and the front left wheel speed sensor for fault
C1A91-36	Front left wheel speed sensor circuit - signal frequency too low	<ul style="list-style-type: none"> Circuit fault Sensor internal failure Module internal fault 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the circuit between the ABS module and the front left wheel speed sensor for fault
C1A91-38	Front left wheel speed sensor circuit - signal	<ul style="list-style-type: none"> Front left wheel speed sensor reluctor ring damaged 	<ul style="list-style-type: none"> Visually inspect the front left wheel speed sensor reluctor ring for damage. Replace as required. Refer to the new module / component

	frequency incorrect		installation note at the top of the DTC index
C1A91-62	Front left wheel speed sensor circuit - signal compare failure	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the front left wheel speed sensor for fault
C1A91-64	Front left wheel speed sensor circuit - signal plausibility failure	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the front left wheel speed sensor for fault
C1A91-65	Front left wheel speed sensor circuit - signal has too few transitions / events	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the front left wheel speed sensor for fault
C1A91-78	Front left wheel speed sensor circuit - alignment or adjustment incorrect	<ul style="list-style-type: none"> ▪ Front left wheel speed sensor to reluctor ring air gap incorrect 	<ul style="list-style-type: none"> ▪ Check and correct the front left wheel speed sensor reluctor ring air gap
C1A92-13	Rear left wheel speed sensor circuit - circuit open	<ul style="list-style-type: none"> ▪ Open circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the rear left wheel speed sensor for open circuit
C1A92-25	Rear left wheel speed sensor circuit - signal shape / waveform failure	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the rear left wheel speed sensor for fault
C1A92-2F	Rear left wheel speed sensor circuit - signal erratic	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the rear left wheel speed sensor for fault
C1A92-36	Rear left wheel speed sensor circuit - signal frequency too low	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the rear left wheel speed sensor for fault
C1A92-38	Rear left wheel speed sensor circuit - signal frequency incorrect	<ul style="list-style-type: none"> ▪ Rear left wheel speed sensor reluctor ring damaged 	<ul style="list-style-type: none"> ▪ Visually inspect the rear left wheel speed sensor reluctor ring for damage. Replace as required. Refer to the new module / component installation note at the top of the DTC index

C1A92-62	Rear left wheel speed sensor circuit - signal compare failure	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the rear left wheel speed sensor for fault
C1A92-64	Rear left wheel speed sensor circuit - signal plausibility failure	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the rear left wheel speed sensor for fault
C1A92-65	Rear left wheel speed sensor circuit - signal has too few transitions / events	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the rear left wheel speed sensor for fault
C1A92-78	Rear left wheel speed sensor circuit - alignment or adjustment incorrect	<ul style="list-style-type: none"> ▪ Rear left wheel speed sensor to reluctor ring air gap incorrect 	<ul style="list-style-type: none"> ▪ Check and correct the rear left wheel speed sensor reluctor ring air gap
C1A93-13	Rear right wheel speed sensor circuit - circuit open	<ul style="list-style-type: none"> ▪ Open circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the rear right wheel speed sensor for open circuit
C1A93-25	Rear right wheel speed sensor circuit - signal shape / waveform failure	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the rear right wheel speed sensor for fault
C1A93-2F	Rear right wheel speed sensor circuit - signal erratic	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the rear right wheel speed sensor for fault
C1A93-36	Rear right wheel speed sensor circuit - signal frequency too low	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the rear right wheel speed sensor for fault
C1A93-38	Rear right wheel speed sensor circuit - signal frequency incorrect	<ul style="list-style-type: none"> ▪ Rear left wheel speed sensor reluctor ring damaged 	<ul style="list-style-type: none"> ▪ Visually inspect the rear right wheel speed sensor reluctor ring for damage. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A93-62	Rear right wheel speed sensor circuit -	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure 	

	signal compare failure	<ul style="list-style-type: none"> ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the rear right wheel speed sensor for fault
C1A93-64	Rear right wheel speed sensor circuit - signal plausibility failure	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the rear right wheel speed sensor for fault
C1A93-65	Rear right wheel speed sensor circuit - signal has too few transitions / events	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the rear right wheel speed sensor for fault
C1A93-78	Rear right wheel speed sensor circuit - alignment or adjustment incorrect	<ul style="list-style-type: none"> ▪ Rear left wheel speed sensor to reluctor ring air gap incorrect 	<ul style="list-style-type: none"> ▪ Check and correct the rear right wheel speed sensor reluctor ring air gap
C1A94-13	Front right wheel speed sensor circuit - circuit open	<ul style="list-style-type: none"> ▪ Open circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the front right wheel speed sensor for open circuit
C1A94-25	Front right wheel speed sensor circuit - signal shape / waveform failure	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the front right wheel speed sensor for fault
C1A94-2F	Front right wheel speed sensor circuit - signal erratic	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the front right wheel speed sensor for fault
C1A94-36	Front right wheel speed sensor circuit - signal frequency too low	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the front right wheel speed sensor for fault
C1A94-38	Front right wheel speed sensor circuit - signal frequency incorrect	<ul style="list-style-type: none"> ▪ Front right wheel speed sensor reluctor ring damaged 	<ul style="list-style-type: none"> ▪ Visually inspect the front right wheel speed sensor reluctor ring for damage. Replace as required. Refer to the new module / component installation note at the top of the DTC index
C1A94-62	Front right wheel speed sensor circuit -	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure 	

	signal compare failure	<ul style="list-style-type: none"> ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the front right wheel speed sensor for fault
C1A94-64	Front right wheel speed sensor circuit - signal plausibility failure	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the front right wheel speed sensor for fault
C1A94-65	Front right wheel speed sensor circuit - signal has too few transitions / events	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure ▪ Module internal fault 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the circuit between the ABS module and the front right wheel speed sensor for fault
C1A94-78	Front right wheel speed sensor circuit - alignment or adjustment incorrect	<ul style="list-style-type: none"> ▪ Front right wheel speed sensor to reluctor ring air gap incorrect 	<ul style="list-style-type: none"> ▪ Check and correct the front right wheel speed sensor reluctor ring air gap
C1A95-4A	Wheel speed sensor circuit - incorrect component installed	<ul style="list-style-type: none"> ▪ Incorrect wheel speed sensor installed 	<ul style="list-style-type: none"> ▪ Check the correct wheel speed sensor is installed to vehicle specification
C1A95-62	Wheel speed sensor circuit - signal compare failure	<ul style="list-style-type: none"> ▪ Incorrectly oriented wheel speed sensor 	<ul style="list-style-type: none"> ▪ Locate for the incorrectly orientated wheel speed sensor. Remove and relocate correctly
C1A95-64	Wheel speed sensor circuit - signal plausibility failure	<ul style="list-style-type: none"> ▪ Multiple circuit faults ▪ Multiple sensor internal failures ▪ Multiple module internal failures 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the ABS module circuit to the wheel speed sensors for multiple circuit or sensor internal failures. If no individual sensor or circuit faults are evident replace the 4 wheel speed sensors. Refer to the warranty policy and procedures manual if a module / component is suspect
C1A96-24	Brake light switch circuit - signal stuck high	<ul style="list-style-type: none"> ▪ Stoplamp-switch (BLS) signal is Active (1) (Footbrake pedal pressed condition) for more than 60 seconds while the vehicle is not braking ▪ Stoplamp-switch circuit fault ▪ Stoplamp-switch internal fault ▪ Stoplamp-switch incorrect installation 	<ul style="list-style-type: none"> ▪ Refer to Workshop Manual Section 206-09 Diagnosis and Testing GO to Pinpoint Test A. ▪ Refer to the electrical circuit diagrams and check the ABS module circuit to the stoplamp switch for circuit short to power

		<ul style="list-style-type: none"> ▪ Stoplamp-switch incorrectly adjusted 	
C1A96-62	Brake light switch circuit - signal compare failure	<ul style="list-style-type: none"> ▪ Signal compare failure the stoplamp-switch (BLS) and the brake-switch (BS) have shared the same output state at the same time ▪ Stoplamp-switch circuit fault ▪ Stoplamp-switch internal fault 	<ul style="list-style-type: none"> ▪ Refer to Workshop Manual Section 206-09 Diagnosis and Testing GO to Pinpoint Test B. ▪ Refer to the electrical circuit diagrams and check the ABS module circuit to the stoplamp switch for circuit for fault
C1A96-64	Brake light switch circuit - signal plausibility failure	<ul style="list-style-type: none"> ▪ Signal plausibility failure the brake fluid hydraulic pressure (PS) has exceeded 10bar and the stoplamp-switch output state has not switched from Inactive (0) to Active (1) (Footbrake pedal pressed condition) ▪ Stoplamp-switch Circuit fault ▪ Stoplamp-switch internal fault ▪ Stoplamp-switch incorrect installation ▪ Stoplamp-switch incorrectly adjusted 	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p> NOTE:</p> <p>Check for pressure sensor DTCs C1A99-01 or C1A99-49. If either of these DTCs has been stored carry out the specified action prior to investigating DTC C1A96-64</p> </div> <ul style="list-style-type: none"> ▪ Refer to Workshop Manual Section 206-09 Diagnosis and Testing GO to Pinpoint Test C. ▪ Refer to the electrical circuit diagrams and check the ABS module circuit to the stoplamp switch for circuit for fault
C1A97-24	Lateral accelerometer circuit - signal stuck high	<ul style="list-style-type: none"> ▪ The signal from the yaw rate sensor is greater than expected when the vehicle is stationary ▪ Circuit short to power 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the anti-lock (ABS) control module CAN bus circuit to the yaw rate sensor. Check the power and ground supply circuits to the yaw rate sensor also check the installation and location for security
C1A97-27	Lateral accelerometer circuit - signal rate of change above threshold	<ul style="list-style-type: none"> ▪ The signal from the yaw rate sensor is above the preset maximum 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the anti-lock (ABS) control module CAN bus circuit to the yaw rate sensor. Check the power and ground supply circuits to the yaw rate sensor also check the installation and location for security
C1A97-28	Lateral accelerometer circuit - signal bias level out of range / zero adjustment failure	<ul style="list-style-type: none"> ▪ Yaw rate sensor signal bias level out of range / zero adjustment failure 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the anti-lock (ABS) control module CAN bus circuit to the yaw rate sensor. Check the power and ground supply circuits to the yaw rate sensor also check the installation and location for security

C1A97-29	Lateral accelerometer circuit - signal invalid	<ul style="list-style-type: none"> ▪ The value from the yaw rate sensor is invalid 	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">  NOTE: Driving conditions such as driving in circles or a banked track may cause the DTC to log </div> <ul style="list-style-type: none"> ▪ Confirm that driving style has not caused the DTC to log. Using the manufacturer approved diagnostic system. Clear the DTC and retest. Refer to the electrical circuit diagrams and check the anti-lock (ABS) control module CAN bus circuit to the yaw rate sensor. Check the power and ground supply circuits to the yaw rate sensor also check the installation and location for security
C1A97-49	Lateral accelerometer circuit - internal electronic failure	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the anti-lock (ABS) control module CAN bus circuit to the yaw rate sensor. Check the power and ground supply circuits to the yaw rate sensor also check the installation and location for security
C1A97-64	Lateral accelerometer circuit - signal plausibility failure	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the ABS module CAN bus circuit to the yaw rate sensor. Check the power and ground supply circuits to the yaw rate sensor also check the installation and location for security
C1A98-08	Yaw rate sensor circuit - bus signal / message failures	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the ABS module CAN bus circuit to the yaw rate sensor. Check the power and ground supply circuits to the yaw rate sensor also check the installation and location for security
C1A98-22	Yaw rate sensor circuit - signal amplitude > maximum	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the ABS module CAN bus circuit to the yaw rate sensor. Check the power and ground supply circuits to the yaw rate sensor also check the installation and location for security
C1A98-28	Yaw rate sensor circuit - signal bias level out of range / zero adjustment failure	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the ABS module CAN bus circuit to the yaw rate sensor. Check the power and ground supply circuits to the yaw rate sensor also check the installation and location for security
C1A98-29	Yaw rate sensor circuit -	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the ABS module CAN bus

	signal invalid		circuit to the yaw rate sensor. Check the power and ground supply circuits to the yaw rate sensor also check the installation and location for security
C1A98-61	Yaw rate sensor circuit - signal calculation failure	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the ABS module CAN bus circuit to the yaw rate sensor. Check the power and ground supply circuits to the yaw rate sensor also check the installation and location for security
C1A98-62	Yaw rate sensor circuit - signal compare failure	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the ABS module CAN bus circuit to the yaw rate sensor. Check the power and ground supply circuits to the yaw rate sensor also check the installation and location for security
C1A98-64	Yaw rate sensor circuit - signal plausibility failure	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the ABS module CAN bus circuit to the yaw rate sensor. Check the power and ground supply circuits to the yaw rate sensor also check the installation and location for security
C1A98-86	Yaw rate sensor circuit - signal invalid	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the ABS module CAN bus circuit to the yaw rate sensor. Check the power and ground supply circuits to the yaw rate sensor also check the installation and location for security
C1A98-87	Yaw rate sensor circuit - missing message	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the ABS module CAN bus circuit to the yaw rate sensor. Check the power and ground supply circuits to the yaw rate sensor also check the installation and location for security
C1A98-92	Yaw rate sensor circuit - performance or incorrect operation	<ul style="list-style-type: none"> ▪ Circuit fault ▪ Sensor internal failure 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the ABS module CAN bus circuit to the yaw rate sensor. Check the power and ground supply circuits to the yaw rate sensor also check the installation and location for security
C1A98-95	Yaw rate sensor circuit - incorrect assembly	<ul style="list-style-type: none"> ▪ Incorrect component installed 	<ul style="list-style-type: none"> ▪ Confirm the correct yaw rate sensor. is installed to vehicle specification
C1A98-96	Yaw rate sensor circuit - component internal failure	<ul style="list-style-type: none"> ▪ Sensor internal failure 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the ABS module CAN bus circuit to the yaw rate sensor. Check

			the power and ground supply circuits to the yaw rate sensor also check the installation and location for security
C1A99-01	Pressure sensor circuit - general electrical failure	<ul style="list-style-type: none"> ▪ ABS module internal failure 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system clear the DTC and retest. If the DTC returns suspect the ABS module. Replace as required. Refer to the warranty policy and procedures manual if a module / component is suspect
C1A99-49	Control module - internal electronic failure	<ul style="list-style-type: none"> ▪ ABS module internal failure 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system clear the DTC and retest. If the DTC returns suspect the ABS module. Replace as required. Refer to the warranty policy and procedures manual if a module / component is suspect
C1B00-27	Steering angle sensor -signal rate of change above threshold	<ul style="list-style-type: none"> ▪ Steering angle sensor internal failure 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system, check the steering angle sensor module for related stored DTCs
C1B00-29	Steering angle sensor - signal invalid	<ul style="list-style-type: none"> ▪ Steering angle sensor internal failure 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system, check the steering angle sensor module for related stored DTCs
C1B00-61	Steering angle sensor - signal calculation failure	<ul style="list-style-type: none"> ▪ Steering angle sensor internal failure 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system, check the steering angle sensor module for related stored DTCs
C1B00-64	Steering angle sensor - signal plausibility failure	<ul style="list-style-type: none"> ▪ Steering angle sensor internal failure 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system, check the steering angle sensor module for related stored DTCs
C1B00-92	Steering angle sensor - performance or incorrect operation	<ul style="list-style-type: none"> ▪ Steering angle sensor internal failure 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system, check the steering angle sensor module for related stored DTCs
C1B02-01	Return pump circuit - general electrical failure	<ul style="list-style-type: none"> ▪ ABS module internal failure 	<ul style="list-style-type: none"> ▪ Suspect the ABS module. Replace as required. Refer to the warranty policy and procedures manual if a module / component is suspect
C1B02-16	Return pump circuit - circuit voltage below threshold	<ul style="list-style-type: none"> ▪ Return pump circuit voltage below threshold 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the ABS module for battery voltage at the fused supply (UBMR) circuit

C1B02-49	Return pump circuit - internal electronic failure	<ul style="list-style-type: none"> ▪ ABS module internal failure 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system clear the DTC and retest. If the DTC returns suspect the ABS module. Replace as required. Refer to the warranty policy and procedures manual if a module / component is suspect
C1B22-24	Hill descent switch - signal stuck high	<ul style="list-style-type: none"> ▪ Circuit short to power 	<div style="border: 1px solid black; background-color: #e0f2f1; padding: 5px; margin-bottom: 5px;"> <p> NOTE:</p> </div> <div style="border: 1px solid black; background-color: #fff9c4; padding: 5px; margin-bottom: 5px;"> <p>This DTC may be logged if the switch is pressed for over 1 minute</p> </div> <ul style="list-style-type: none"> ▪ Check for correct hill decent switch operation. Refer to the electrical circuit diagrams and check the Centre-console switch-pack / Hill-decent Switch circuit for short to power
C2009-95	Front axle wheel speed sensors swapped - incorrect assembly	<ul style="list-style-type: none"> ▪ Incorrect component installed 	<ul style="list-style-type: none"> ▪ Correctly relocate the front wheel speed sensors
C200A-95	Rear axle wheel speed sensors swapped - incorrect assembly	<ul style="list-style-type: none"> ▪ Incorrect component installed 	<ul style="list-style-type: none"> ▪ Correctly relocate the rear wheel speed sensors
U0100-87	Lost communication with ECM/PCM "A" - missing message	<ul style="list-style-type: none"> ▪ Missing message from the engine control module 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the power, ground and CAN bus connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Check the engine control module for related stored DTCs
U0101-87	Lost communication with TCM - missing message	<ul style="list-style-type: none"> ▪ Missing message from the transmission control module 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the power, ground and CAN bus connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Check the transmission control module for related stored DTCs
U0102-87	Lost communication with transfer case control	<ul style="list-style-type: none"> ▪ Missing message from the transfer case control module 	<ul style="list-style-type: none"> ▪ Refer to the electrical circuit diagrams and check the power, ground and CAN bus connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Check the

	module - missing message		transfer case control module for related stored DTCs
U0104-87	Lost communication with cruise control module - missing message	<ul style="list-style-type: none"> Missing message from the adaptive cruise control module 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the power, ground and CAN bus connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Check the adaptive cruise control module for related stored DTCs
U0126-87	Lost communication with steering angle sensor module - missing message	<ul style="list-style-type: none"> Missing message from the steering angle sensor module 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the power, ground and CAN bus connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Check the steering angle sensor module for related stored DTCs
U0128-87	Lost communication with park brake control module - missing message	<ul style="list-style-type: none"> Missing message from the park brake control module 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the power, ground and CAN bus connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Check the park brake control module for related stored DTCs
U0132-87	Lost communication with ride level control module - missing message	<ul style="list-style-type: none"> Missing message from the air suspension control module 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the power, ground and CAN bus connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Check the air suspension control module for related stored DTCs
U0133-87	Lost communication with active roll control module - missing message	<ul style="list-style-type: none"> Missing message from the dynamic response module 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the power, ground and CAN bus connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Check the dynamic response module for related stored DTCs
U0136-87	Lost communication with differential control module - rear - missing message	<ul style="list-style-type: none"> Missing message from the rear differential control module 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the power, ground and CAN bus connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Check the rear differential control module for related stored DTCs

U0138-87	Lost communication with all terrain control module - missing message	<ul style="list-style-type: none"> Missing message from the terrain response control module 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the power, ground and CAN bus connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Check the terrain response control module for related stored DTCs
U0155-87	Lost communication with instrument panel cluster (IPC) control module - missing message	<ul style="list-style-type: none"> Missing message from the instrument panel cluster control module 	<ul style="list-style-type: none"> Refer to the electrical circuit diagrams and check the power, ground and CAN bus connections to the module. Using the manufacturer approved diagnostic system, complete a CAN network integrity test. Check the instrument panel cluster control module for related stored DTCs
U0401-68	Invalid data received from ECM/PCM - event information	<ul style="list-style-type: none"> Invalid data received from the engine control module 	<ul style="list-style-type: none"> Using the manufacturer approved diagnostic system check the engine control module for related stored DTCs
U0402-68	Invalid data received from transmission control module - event information	<ul style="list-style-type: none"> Invalid data received from the transmission control module 	<ul style="list-style-type: none"> Using the manufacturer approved diagnostic system check the transmission control module for related stored DTCs
U0403-68	Invalid data received from transfer case control module - event information	<ul style="list-style-type: none"> Invalid data received from the transfer case control module 	<ul style="list-style-type: none"> Using the manufacturer approved diagnostic system check the transfer case control module for related stored DTCs
U0405-68	Invalid data received from cruise control module - event information	<ul style="list-style-type: none"> Invalid data received from the adaptive cruise control module 	<ul style="list-style-type: none"> Using the manufacturer approved diagnostic system check the adaptive cruise control module for related stored DTCs
U0417-68	Invalid data received from park brake control module - event information	<ul style="list-style-type: none"> Invalid data received from the park brake control module 	<ul style="list-style-type: none"> Using the manufacturer approved diagnostic system check the park brake control module for related stored DTCs
U0421-68	Invalid data received from ride level control module - event information	<ul style="list-style-type: none"> Invalid data received from the air suspension control module 	<ul style="list-style-type: none"> Using the manufacturer approved diagnostic system check the air suspension control module for related stored DTCs
U0428-68	Invalid data received from steering angle	<ul style="list-style-type: none"> Invalid data received from the steering angle sensor module 	<ul style="list-style-type: none"> Using the manufacturer approved diagnostic system check the steering angle sensor module for related stored DTCs

	sensor module - event information		
U1A49-68	Invalid data received from all terrain control module - event information	<ul style="list-style-type: none"> Invalid data received from the terrain response control module 	<ul style="list-style-type: none"> Using the manufacturer approved diagnostic system check the terrain response control module for related stored DTCs
U1A4A-68	Invalid data received from differential control module - rear - event information	<ul style="list-style-type: none"> Invalid data received from the rear differential control module 	<ul style="list-style-type: none"> Using the manufacturer approved diagnostic system check the rear differential control module for related stored DTCs
U2001-68	Reduced system function - event information	<p> NOTE:</p> <p>Not a fault condition. System operation suspended while system cools. Customer may have seen the warning lamp illuminated during a period of reduced functionality or may have noticed the vehicle behaving differently in relation to a traction control event</p> <ul style="list-style-type: none"> Event information 	<p> NOTE:</p> <p>This DTC is stored if the control module reduces the level of functionality, to prevent over-heating of the foundation brakes. This is a normal function of the ECU and is not a fault</p> <ul style="list-style-type: none"> Clear / ignore this DTC
U3000-55	Control module - not configured	<ul style="list-style-type: none"> Mismatch with master configure ID 	<ul style="list-style-type: none"> Check the correct ABS module is installed to vehicle specification. Check that the Central Broadcast VIN matches the vehicle VIN. Refit the original module or replace as required

PINPOINT TESTS

PINPOINT TEST A : STOPLAMP-SWITCH PLAUSIBILITY FAULT (DTC C1A96-24)

TEST
CONDITIONS

DETAILS/RESULTS/ACTIONS

A1: CUSTOMER INDUCED DTC

 NOTES:

- These tests are to be carried out if DTC C1A96-24 has been stored. This DTC indicates plausibility – The stoplamp-switch signal is high (Footbrake pedal pressed condition) while the vehicle is not braking.
- Plausibility detail – A DTC will be stored if the stoplamp-switch signal is high for more than 60 seconds while the accelerator pedal is pressed and the vehicle speed is greater than 7 mph/10.8 km/h and the ABS Module is not actively controlling pressure.

1 Confirm that the fault is not being provoked by a customer driving habit (Resting a foot on the brake pedal while accelerating / cruising).

Is the fault being provoked by a customer driving habit?

Yes

Advise the customer that the cause of the DTC being stored maybe due to his/her foot resting on the brake pedal whilst the vehicle is in motion. Clear the stored DTC, operate the footbrake and check for correct stoplamp operation.

No

GO to A2 .

A2: STOPLAMP-SWITCH ADJUSTMENT CHECK

NOTE:

Removal and correct installation of the stoplamp-switch will reset the adjustment. Ensure the footbrake pedal is fully raised against its upstop, (pedal rest position) when installing the stoplamp-switch.

1 Check that the stoplamp-switch is securely installed and correctly adjusted. REFER to: Stoplamp Switch (417-01, Removal and Installation).

Is the stoplamp-switch securely installed and correctly adjusted?

Yes

GO to A3 .

No

Adjust the stoplamp-switch using the approved process. Clear the stored DTC, operate the Footbrake and check for correct stoplamp operation.

A3: STOPLAMP CIRCUIT SHORT TO POWER

NOTE:

If a circuit short to power is present the stoplamps may be illuminated (Footbrake Pedal released).

1 Using the manufacturer approved diagnostic system, monitor the Data Logger Signal, PID-2B00 (brake input switch status - brake pedal switch / brake lamp switch), set the Ignition-state to the on position and with the footbrake released PID-2B00 (brake input switch status) should show **Inactive (BLS = 0)** .

Does PID-2B00 (brake input switch status) show Inactive (BLS =0)?

Yes

GO to A4 .

No

Refer to electrical circuit diagrams to locate the fault. Repair the circuit as required using the approved process. Clear the stored DTC, operate the Footbrake and check for correct stoplamp operation.

A4: SHORT CIRCUIT TO ANOTHER POWER CIRCUIT

 **NOTE:**

A short circuit to another circuit will cause the DTC to log in the ABS Module.

	<p>1 Using the manufacturer approved diagnostic system, monitor the Data-logger signal, PID-2B00 (brake input switch status - brake pedal switch / brake lamp switch), set the Ignition-state to the on position and with the footbrake released PID-2B00 (brake input switch status) should show Inactive (BLS = 0) .</p>
	<p>2 Operate any electrical circuits that could supply a voltage to the stoplamp-switch circuit.</p>
	<p>Does PID-2B00 (brake input switch status) show Inactive (BLS =0) ?</p> <p>Yes Suspect an intermittent fault. Carry out visual and mechanical check of splice joints, all connectors and cables, check for corrosion, bent or damaged contact faces of pins, terminals and for security of connectors. Where possible flex cables while using the manufacturer approved diagnostic system to monitor the Data-logger signal, PID-2B00 (brake input switch status - brake pedal switch / brake lamp switch). This test should be carried out with the ignition on and the footbrake pedal in the released position. BLS should remain Inactive (BLS=0) .</p> <p>No Refer to electrical circuit diagrams to locate the fault. Repair the circuit as required using the approved process. Clear the stored DTC, operate the footbrake and check for correct stoplamp operation.</p>

PINPOINT TESTS

PINPOINT TEST B : SIGNAL COMPARE PLAUSIBILITY (DTC C1A96-62)

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
B1: STOPLAMP-SWITCH CIRCUIT	
<p> NOTES:</p> <ul style="list-style-type: none"> ▪ These tests are to be carried out if DTC C1A96-62 signal compare - plausibility, has been stored. This DTC indicates that the brake lamp switch and brake switch have shared the same state (both switches in the open circuit condition at the same time). ▪ The stoplamp switch contains the brake-lamp switch (BLS) and the brake-switch (BS) these are located within the same housing. ▪ Signal compare - plausibility: Brake lamp switch and brake switch must not be open circuit at the same time. ▪ The datalogger-signals represent the position of the stoplamp switch. Both the brake lamp switch (BLS) and the brake switch (BS) are shown as active with the footbrake pressed and inactive with the footbrake released. This does not directly reflect the state of the stoplamp switch internal switch contacts as shown in the circuit diagrams. 	
	<p>1 Using the manufacturer approved diagnostic system, monitor the data-logger signal, PID-2B00 (brake input switch status - brake pedal switch / brake lamp switch) and PID-2B00 (brake input switch status - brake pedal switch /brake switch) inputs while the footbrake pedal is slowly pressed & released.</p>
	<p>2 BLS = Brake Pedal Switch (brake lamp switch), BS = Brake Pedal Switch (brake switch). The correct inputs should be, pedal released BLS = Inactive (BLS = 0) , BS</p>

	<p>= Inactive (BS = 0) . Brief transition (as the pedal is pressed BLS = Active (BLS = 1) , BS = Inactive (BS = 0) . Pedal pressed BLS = Active (BLS = 1) , BS = Active (BS = 1) . If either input remains inactive during the test procedure a fault is evident.</p>
	<p>Did the inputs show correctly?</p> <p>Yes</p> <p>Suspect an intermittent fault. Carry out visual and mechanical check of splice joints, all connectors and cables, check for corrosion, bent or damaged contact faces of pins, terminals and for security of connectors. Where possible flex cables while using the manufacturer approved diagnostic system, monitor the data-logger signal, PID-2B00 (brake input switch status - brake pedal switch / brake lamp switch) and PID-2B00 (brake input switch status - brake pedal switch /brake switch). This test should be carried out with the stoplamp-switch in both the pressed and released position independently. Refer to electrical circuit diagrams to locate the intermittent open circuit. Repair the circuit as required using the approved process. Clear the stored DTC, operate the footbrake and check for correct stoplamp operation.</p> <p>No</p> <p>GO to B2 .</p>
B2: STOPLAMP-SWITCH CIRCUIT 2	
	<p>1 If BLS = Inactive (0) BS = Active (1) occurred with the footbrake released the fault is with the (BS) = Brake Pedal Switch (brake switch) circuit . If BLS = Inactive (0) BS = Active (1) occurred with the footbrake pressed the fault is with the (BLS) = Brake-pedal switch (brake lamp switch) circuit .</p>
	<p>Did BLS (brake lamp switch) = Inactive (0) BS (brake switch) = Active (1) occur with the footbrake released?</p> <p>Yes</p> <p>Suspect a stoplamp-switch (brake switch) circuit fault. Refer to electrical circuit diagrams and replace blown fuse or locate the open circuit. Repair the circuit as required using the approved process. Clear the stored DTC, operate the footbrake and check for correct stoplamp operation.</p> <p>No</p> <p>Suspect a stoplamp-switch (brake lamp switch) circuit fault. Refer to electrical circuit diagrams and replace blown fuse or locate the open circuit. Repair the circuit as required using the approved process. Clear the stored DTC, operate the footbrake and check for correct stoplamp operation.</p>

PINPOINT TEST C : PLAUSIBILITY – STOPLAMP-SWITCH (BLS) VERSES BRAKE PRESSURE (PS) (DTC C1A96-64)	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
C1: IDS MONITOR	
<div style="border: 1px solid black; padding: 5px;"> <p> NOTES:</p> <ul style="list-style-type: none"> ▪ These tests are to be carried out if DTC C1A96-64 plausibility – Stoplamp-switch (BLS) verses brake fluid hydraulic pressure (PS) has been stored. ▪ This DTC indicates plausibility – the stoplamp-switch must be seen to operate before brake fluid hydraulic pressure (PS) exceeds a pressure threshold of 10 Bar. ▪ The stoplamp-switch status is monitored by the ABS module (BLS terminal 30). ▪ The ABS module contains an internal pressure sensor and monitors the brake fluid hydraulic pressure (PS). </div>	
	<p>1 Using the manufacturer approved diagnostic system, check for ABS module pressure sensor DTCs C1A99-01 or C1A99-49. If either of these DTCs has been stored carry out the specified action prior to investigating DTC C1A96-64.</p>

	<p>2 Using the manufacturer approved diagnostic system, monitor the data-logger signal PID-2B00 (brake input switch status - brake pedal switch / brake lamp switch) and PID-2B0D (brake fluid hydraulic pressure) . When the brake pedal is pressed, the (brake-pedal switch / brake lamp switch) status should change from Inactive (BLS = 0) to Active (BLS = 1) before the brake fluid hydraulic pressure reaches 1000KPa (10 Bar).</p>
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	<p>Does the (brake pedal switch / brake lamp switch) change from Inactive (BLS = 0) to Active (BLS = 1) before the brake fluid hydraulic pressure reaches 1000KPa (10 Bar) ?</p> <p>Yes</p> <p>Suspect an intermittent brake-lamp switch circuit fault. Refer to electrical circuit diagrams, carry out visual and mechanical check of the of splice joints, connectors and cables of the stoplamp-switch circuit, check for corrosion, bent or damaged contact faces of pins, terminals and for security of connectors. Where possible flex cables to attempt to induce the intermittent open circuit. Repair the circuit as required using the approved process. Clear the stored DTC, operate the Footbrake and check for correct stoplamp operation.</p> <p>No</p> <p>GO to C2 .</p>
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C2: STOPLAMP-SWITCH ADJUSTMENT CHECK

 **NOTE:**

Removal and correct installation of the stoplamp-switch will reset the adjustment. Ensure the footbrake pedal is fully raised against its upstop, (pedal rest position) when installing the stoplamp switch.

	<p>1 Check that the stoplamp-switch is securely installed and correctly adjusted. REFER to: Stoplamp Switch (417-01, Removal and Installation).</p>
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	<p>Is the fault still present with the stoplamp-switch securely installed and correctly adjusted?</p> <p>Yes</p> <p>Suspect a brake-lamp switch circuit fault. Refer to electrical circuit diagrams, carry out visual and mechanical check of the splice joints, connectors and cables of the stoplamp-switch circuit, check for corrosion, bent or damaged contact faces of pins, terminals and for security of connectors. Repair the circuit as required using the approved process. Clear the stored DTC, operate the Footbrake and check for correct stoplamp operation.</p> <p>No</p> <p>Adjust the stoplamp-switch using the approved process. Clear the stored DTC, operate the footbrake and check for correct stoplamp operation.</p>
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