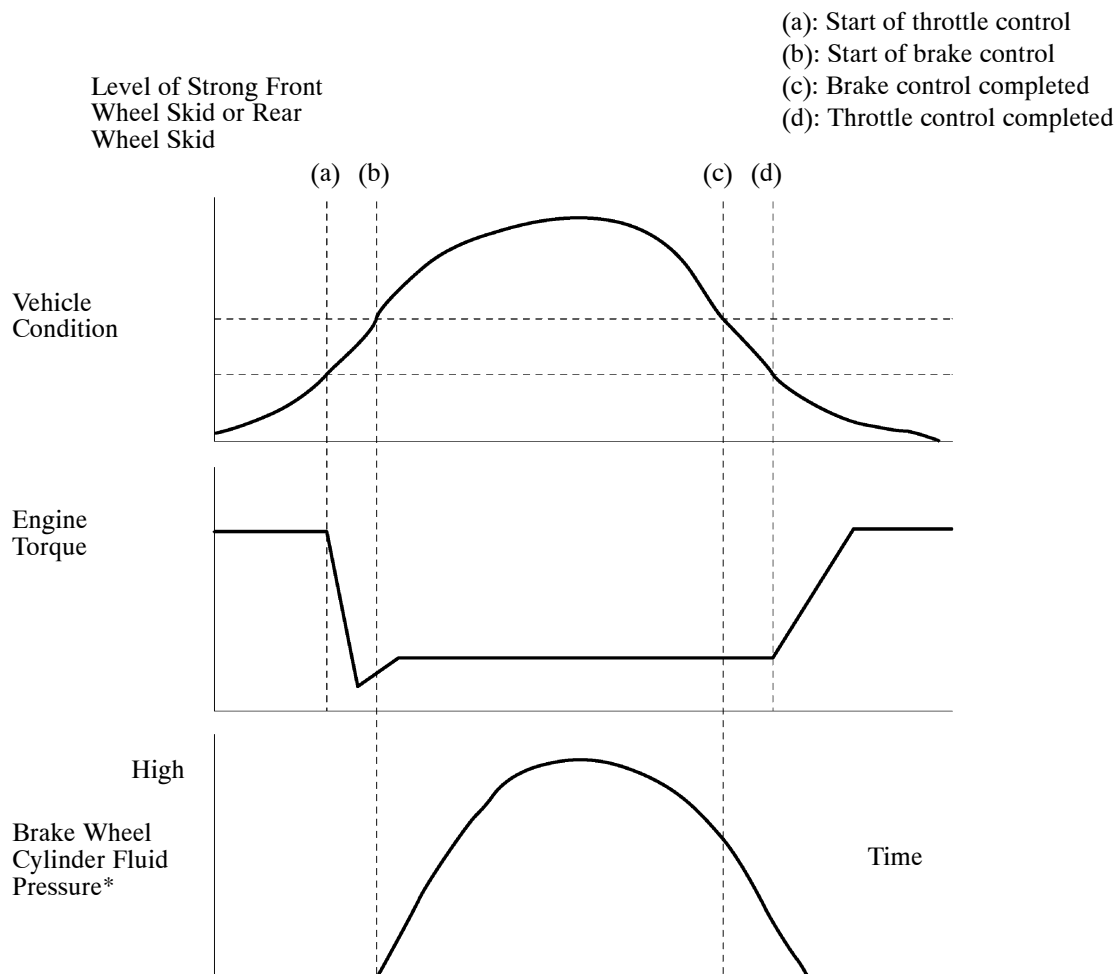


8. Skid Control ECU

VSC

Based on the 4 different sensor signals received from the speed sensors, yaw rate & deceleration sensor and steering angle sensor, the skid control ECU calculates the vehicle condition.

If a strong front wheel skid or rear wheel skid tendency is created during an emergency avoidance maneuver or cornering, and the skid control ECU determines that the amount of vehicle condition exceeds a prescribed value, it controls the engine torque through throttle and the brake fluid pressure according to the amount of needed to control the vehicle.



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*: The wheel cylinder that activates varies depending on the condition of the vehicle.

Initial Check

Each time the ignition switch is turned ON, and the vehicle reaches approximately speed of 6 km/h (4 mph) or more, the skid control ECU performs the initial check.

The functions of each solenoid valve and pump motor in the brake actuator are checked in order.

Self-Diagnosis

- If the skid control ECU detects a malfunction in the ABS with EBD, Brake Assist, TRC, or VSC systems, the ABS, brake system, and VSC warning lights and the TRC OFF indicator light, which correspond to the malfunction that has been detected, indicate or light up, as shown in the table below, to alert the driver of the malfunction.

○ : Light ON — :Light OFF

Item	ABS	EBD	Brake Assist	TRC	VSC
ABS Warning Light	○	○	○	—	—
Brake System Warning Light	—	○	—	—	—
TRC OFF Indicator Light	—	—	—	○	○
VSC Warning Light	—	—	—	○	○

- At the same time, the DTCs (Diagnostic Trouble Codes) are stored in memory. The DTC can be read by connecting the SST (09843-18040) between the Tc and CG terminals of the DLC3 and observing the blinking of the ABS warning light and VSC warning light, or by connecting a hand-held tester.
- This system has a sensor signal check (test mode) function. This function is activated by connecting the SST (09843-18040) between the Ts and CG terminals of the DLC3 or by connecting a hand-held tester. This check function performs yaw rate sensor zero point calibration, deceleration sensor zero point calibration, yaw rate sensor check, master cylinder pressure sensor check, and speed sensor check.
- If the skid control ECU detects a malfunction during a sensor check, it stores the DTC in its memory. This DTC can be read during a sensor signal check operation by connecting the Tc and CG terminals of the DLC3 and observing the blinking of the ABS warning light and the VSC warning light, or on a hand-held tester.
- If the CAN has a communication error at ECU or sensors, multiple DTCs (Diagnostic Trouble Codes) are output simultaneously to indicate the malfunction location. For details, refer to page 34.

► DTC Chart (blinking ABS warning light) ◀

DTC No.		Detection Item	DTC No.		Detection Item
2-digit	5-digit		2-digit	5-digit	
11	C0278	Open circuit in ABS SOL relay circuit	34	C0215	Left rear wheel speed sensor signal malfunction
12	C0279	Short circuit in ABS SOL relay circuit	35	C1235	Foreign matter in attached on the tip of the right front sensor
13	C0273	Open circuit in ABS MTR relay circuit	36	C1236	Foreign matter in attached on the tip of the left front sensor
14	C0274	Short circuit in ABS MTR relay circuit	38	C1238	Foreign matter in attached on the tip of the right rear sensor
21	C0226	Open or short circuit in brake actuator solenoid circuit (SFR circuit)	39	C1239	Foreign matter in attached on the tip of the left rear sensor
22	C0236	Open or short circuit in brake actuator solenoid circuit (SFL circuit)	41	C1241	Low battery positive voltage
23	C0246	Open or short circuit in brake actuator solenoid circuit (SRR circuit)	46	C1246	Malfunction in master cylinder pressure sensor
24	C0256	Open or short circuit in brake actuator solenoid circuit (SRL circuit)	49	C1249	Open circuit in stop light switch circuit
25	C1225	Open or short circuit of brake actuator solenoid circuit (SM circuit)	51	C1251	<ul style="list-style-type: none"> • ABS pump motor is locked • Open circuit in pump motor circuit
31	C0200	Right front wheel speed sensor signal malfunction	91	C1361	Short circuit in ABS motor fail safe relay circuit
32	C0205	Left front wheel speed sensor signal malfunction	94	U0121	Malfunction in CAN communication
33	C0210	Right rear wheel speed sensor signal malfunction	Always ON		<ul style="list-style-type: none"> • Malfunction in skid control ECU • Open circuit in ABS warning light circuit

► DTC Chart of sensor check (blinking ABS warning light) ◀

DTC No.		Detection Item	DTC No.		Detection Item
2-digit	5-digit		2-digit	5-digit	
71	C1271	Low output voltage of right front speed sensor	76	C1276	Abnormal change in output voltage of left front speed sensor
72	C1272	Low output voltage of left front speed sensor	77	C1277	Abnormal change in output voltage of right rear speed sensor
73	C1273	Low output voltage of right rear speed sensor	78	C1278	Abnormal change in output voltage of left rear speed sensor
74	C1274	Low output voltage of left rear speed sensor	79	C1279	Deceleration sensor output voltage is faulty
75	C1275	Abnormal change in output voltage of right front speed sensor	81	C1281	Master cylinder pressure sensor output signal is faulty

► DTC Chart (blinking VSC warning light) ◀

DTC No.		Detection Item	DTC No.		Detection Item
2-digit	5-digit		2-digit	5-digit	
31	C1231	Malfunction in steering angle sensor	44	C1224	Open or short circuit in NEO signal circuit
32	C1232	Malfunction in deceleration sensor	51	C1201	Malfunction in Engine ECU
33	C1233	Open or short circuit in yaw rate sensor circuit	53	C1203	Malfunction in Engine ECU communication circuit
34	C1234	Malfunction in yaw rate sensor	62	U0123	Malfunction in CAN communication with yaw rate sensor
36	C1210	Zero point calibration of yaw rate sensor undone	63	U0126	Malfunction in CAN communication with steering angle sensor
39	C1336	Zero point calibration of deceleration sensor undone			
43	C1223	Malfunction in ABS control system	Always ON		<ul style="list-style-type: none"> • Malfunction in skid control ECU • Open circuit in VSC warning indicator circuit

► DTC Chart of sensor check (blinking VSC warning light) ◀

DTC No.		Detection Item
2-digit	5-digit	
71	C0371	Yaw rate sensor output signal is faulty

Fail-Safe

- In the event of a malfunction in the TRC and/or VSC, the skid control ECU prohibits the TRC and VSC operations.
- In the event of a malfunction in the ABS and/or Brake Assist, the skid control ECU prohibits the ABS, Brake Assist, TRC and VSC operations.
- In the event of a malfunction in the EBD control, the skid control ECU prohibits the EBD control. Even in this case, usual braking performance besides the brake control system (ABS with EBD, Brake Assist, TRC and VSC) is secured.
- If a communication malfunction occurs between the skid control ECU and the steering angle sensor or the yaw rate & deceleration sensor, the skid control ECU stops the controls of the TRC and VSC.
- When the Engine ECU detects a DTC, it will disable the TRC and VSC controls.