

# Diagnostic Troubleshooting Code (DTC)

## Symptom-to-System Chart

DIAGNOSTIC TROUBLE CODE (DTC)		DIAGNOSIS/ SYMPTOM	DIAGNOSTIC PERIOD			PROBLEM LOCATION	PROBABLE CAUSE
MAIN CODE	SUB-CODE		INITIAL DIAGNOSIS	INDIVIDUAL DIAGNOSIS	REGULAR DIAGNOSIS		
	—	ABS indicator light does not come on when ignition switch is turned ON					<ul style="list-style-type: none"> <li>Blown BACK-UP LIGHTS (10 A) fuse</li> <li>Open circuit between the BACK-UP LIGHTS (10 A) fuse and ABS indicator light</li> <li>Blown ABS indicator light bulb</li> <li>Open circuit between the ABS indicator light and ABS control unit</li> <li>Open circuit between the ABS control unit and body ground</li> <li>Poor body ground</li> <li>Faulty ABS control unit</li> </ul>
		ABS indicator light does not go off after engine is started					<ul style="list-style-type: none"> <li>Blown RR DEF RLY/HEATER MOTOR RLY/COOLING FAN MOTOR RLY (7.5 A) fuse</li> <li>Open circuit between the under-dash fuse/relay box and ABS control unit</li> <li>Open circuit between the battery and under-hood ABS fuse/relay box</li> <li>Blown ABS B2 (15 A) fuse</li> <li>Open circuit inside the under-hood ABS fuse/relay box</li> <li>Open circuit between the under-hood ABS fuse/relay box and ABS control unit</li> <li>Faulty alternator</li> <li>Open circuit between the alternator and ABS control unit</li> <li>Short to body ground in the WARN circuit between the ABS indicator light and ABS control unit</li> <li>Faulty ABS control unit</li> </ul>
①	—	ABS pump motor over-run	○	○			<ul style="list-style-type: none"> <li>Air mixed in the ABS brake fluid</li> <li>Pressure switch stuck OFF</li> <li>Open circuit between the pressure switch and ABS control unit</li> <li>Open circuit in the P-SW circuit between the pressure switch and body ground, or a poor ground</li> <li>Drop in pump discharge volume</li> <li>Leaking outlet valve</li> <li>Leaking relief valve</li> <li>ABS brake fluid leakage</li> <li>Faulty ABS control unit</li> </ul>
	②	Pump motor	○		○		<ul style="list-style-type: none"> <li>Open circuit or short to body ground between the RR DEF RLY/HEATER MOTOR RLY/COOLING FAN MOTOR RLY (7.5 A) fuse and under-hood ABS fuse/relay box</li> <li>Open circuit or short to body ground in the PMR circuit inside the under-hood ABS fuse/relay box</li> <li>Faulty pump motor relay</li> <li>Open circuit or short to body ground in the PMR circuit between the under-hood ABS fuse/relay box and ABS control unit</li> <li>Blown ABS MOTOR (40 A) fuse</li> <li>Blown ABS UNIT (10 A) fuse</li> <li>Open circuit or short to body ground in the motor drive circuit and MCK circuit inside the under-hood ABS fuse/relay box</li> <li>Open circuit or short to body ground in the MCK circuit between the under-hood ABS fuse/relay box and ABS control unit</li> <li>Open circuit or short to body ground between the under-hood ABS fuse/relay box and pump motor</li> <li>Faulty pump motor</li> <li>Open circuit between the pump motor and body ground or poor ground</li> <li>Faulty ABS control unit</li> </ul>
	③	High pressure leakage			○		<ul style="list-style-type: none"> <li>Leaking outlet valve</li> <li>Leaking relief valve</li> <li>Poor contact in pressure switch circuit</li> </ul>
	④	Pressure switch	○				<ul style="list-style-type: none"> <li>Short to body ground between the ABS control unit and pressure switch</li> <li>Pressure switch stuck ON</li> <li>Faulty ABS control unit</li> </ul>
	⑧	High pressure system	○				<ul style="list-style-type: none"> <li>Accumulator gas leakage</li> <li>Changed relief valve set pressure</li> <li>Rear outlet solenoid valve late to close</li> <li>Changed pressure switch set pressure</li> </ul>
②	①	Parking brake			○		<ul style="list-style-type: none"> <li>Low fluid level in the master cylinder reservoir</li> <li>Open circuit between the BACK-UP LIGHTS (10 A) fuse and brake system light</li> <li>Blown brake system light bulb</li> <li>Open circuit or short to body ground between the brake system light and ABS control unit</li> <li>Parking brake switch stuck ON</li> <li>Short to body ground between the brake system light and parking brake switch</li> <li>Brake fluid level switch stuck ON</li> <li>Short to body ground between the brake system light and brake fluid level switch</li> <li>Faulty ABS control unit</li> </ul>

PROBABLE CAUSE WHEN SYMPTOM DOES NOT REAPPEAR	DESCRIPTION OF DIAGNOSIS	REFER TO PAGE
		19-66
		19-68
	<ul style="list-style-type: none"> <li>The ABS indicator light is turned ON when the pump motor relay ON signal is detected for more than 40 seconds while the ABS is not functioning.</li> </ul>	19-71
<ul style="list-style-type: none"> <li>Intermittent interruption in the MCK circuit</li> <li>Intermittent interruption in the pump motor relay drive circuit</li> <li>Intermittent interruption in the pump motor drive circuit</li> </ul>	<ul style="list-style-type: none"> <li>The ABS indicator light is turned on when battery voltage is detected at the MCK terminal while the pump motor relay OFF signal is detected.</li> <li>The ABS indicator light is turned on when the 0 V is detected at the MCK terminal while the pump motor relay ON signal is detected.</li> </ul>	19-73
<ul style="list-style-type: none"> <li>Intermittent interruption in the pressure switch</li> <li>Intermittent interruption in the pressure switch circuit</li> </ul>	<ul style="list-style-type: none"> <li>The ABS indicator light is turned on when the frequent ON/OFF cycle of the pressure switch signal is detected, that is during the engine in motion. The count is erased when the ABS functions.</li> </ul>	19-79
	<ul style="list-style-type: none"> <li>The ABS indicator light is turned on when the pressure switch ON signal is always detected at every initial diagnosis. The count is erased when the ABS control unit detects the pressure switch OFF signal.</li> </ul>	19-81
<ul style="list-style-type: none"> <li>The ABS indicator light may not come on in normal climate when it comes on in very cold climate.</li> </ul>	<ul style="list-style-type: none"> <li>This diagnosis is performed when the pressure switch is OFF at the initial diagnosis. The pump motor is operated to turn the pressure switch ON, then the solenoid valve is momentarily activated. The ABS indicator light is turned on if the pressure switch signal changes from ON to OFF.</li> </ul>	19-82
<ul style="list-style-type: none"> <li>Driving with the parking brake applied — (No problem)</li> </ul>	<ul style="list-style-type: none"> <li>The ABS indicator light is turned on when the parking brake ON signal is detected for more than 30 seconds while driving.</li> </ul>	19-83

(cont'd)

# Diagnostic Troubleshooting Code (DTC)

## Symptom-to-System Chart (cont'd)

DIAGNOSTIC TROUBLE CODE (DTC)		DIAGNOSIS/ SYMPTOM	DIAGNOSTIC PERIOD			PROBLEM LOCATION	PROBABLE CAUSE
MAIN CODE	SUB-CODE		INITIAL DIAGNOSIS	INDIVIDUAL DIAGNOSIS	REGULAR DIAGNOSIS		
③	①	Pulser			○	Right-front	<ul style="list-style-type: none"> <li>• Chipped pulser gear</li> <li>• Improperly installed wheel sensor</li> </ul>
	②					Left-front	
	④					Right-rear	
	⑧					Left-rear	
	⑫	Different diameter tire			○		<ul style="list-style-type: none"> <li>• Different diameter tire installed</li> </ul>
④	①	Wheel sensor		○	○	Right-front	<ul style="list-style-type: none"> <li>• Open circuit, internal short or short to body ground in the wheel sensor</li> <li>• Open circuit or short to body ground in the positive (+) wire between the wheel sensor and ABS control unit</li> <li>• Open circuit or short to body ground in the negative (-) wire between the wheel sensor and ABS control unit</li> <li>• Positive (+) wire shorted to the negative (-) wire between the wheel sensor and ABS control unit</li> <li>• Loose connector or poor contact of terminals</li> <li>• Improper wheel sensor air gap</li> <li>• Faulty ABS control unit</li> <li>• Missing pulser</li> <li>• Modulator does not decrease pressure properly</li> </ul>
	②					Left-front	
	④					Right-rear	
	⑧					Left-rear	
⑤	—	Rear wheel lock			○	Right/Left	<ul style="list-style-type: none"> <li>• Open circuit, internal short or short to body ground in the wheel sensor system</li> <li>• Rear brake drag</li> <li>• Modulator does not decrease pressure properly</li> <li>• Faulty ABS control unit</li> </ul>
	④					Right	
	⑧					Left	
⑥	—	Fail-safe relay	○			Front/rear	<ul style="list-style-type: none"> <li>• Short to power in the relay drive circuit between the fail-safe relay and ABS control unit</li> <li>• Faulty relay drive transistor (ON) in the ABS control unit</li> <li>• Fail-safe relay stuck ON</li> <li>• Short to power in the solenoid drive circuits between the fail-safe relay and ABS control unit</li> </ul>
	①					Front	
	④					Rear	
⑦	①	Solenoid	○		○	Right-front	<ul style="list-style-type: none"> <li>• Fail-safe relay stuck OFF</li> <li>• Open circuit in the solenoid drive circuit between the under-hood ABS fuse/relay box and ABS control unit</li> <li>• Short to body ground in the solenoid drive circuit between the solenoid and ABS control unit</li> <li>• Faulty solenoid drive transistor (ON) in the ABS control unit</li> <li>• Short to power in the solenoid drive circuit between the solenoid and ABS control unit</li> <li>• Faulty solenoid drive transistor (OFF) in the ABS control unit</li> <li>• Short to power in the drive circuit inside the solenoid</li> <li>• Short to the outlet circuit in the inlet circuit between the solenoid and ABS control unit</li> </ul>
	②					Left-front	
	④					Rear	
⑧	①	ABS function			○		<ul style="list-style-type: none"> <li>• Wheel sensor signal disappears at speeds of 6 mph (10 km/h) or less</li> <li>• Faulty ABS control unit</li> </ul>
	②	CPU comparison	○		○		<ul style="list-style-type: none"> <li>• Faulty ABS control unit</li> </ul>
	④	IC [Integrated Circuit]	○		○		<ul style="list-style-type: none"> <li>• Faulty ABS control unit</li> </ul>

PROBABLE CAUSE WHEN SYMPTOM DOES NOT REAPPEAR	DESCRIPTION OF DIAGNOSIS	REFER TO PAGE
<ul style="list-style-type: none"> <li>Intermittent interruption in the wheel sensor</li> </ul>	<ul style="list-style-type: none"> <li>The ABS indicator light is turned on when the wheel sensor signal is periodically missing during driving.</li> </ul>	19-87
<ul style="list-style-type: none"> <li>(No problem)</li> </ul>	<ul style="list-style-type: none"> <li>The ABS indicator light may be turned on while driving when one, two or three different diameter tires are installed. This diagnosis is not performed when the parking brake switch is ON.</li> </ul>	19-87
<ul style="list-style-type: none"> <li>Intermittent interruption in the wheel sensor</li> <li>Wheel spin of both front wheels (only for DTC 4-8)—(No problem)</li> <li>The transmission downshifted excessively (only for DTC 4-1 and 4-2)—(No problem)</li> </ul>	<ul style="list-style-type: none"> <li>The ABS indicator light is turned on when the wheel sensor signal is missing at speeds of 6 mph (10 km/h) or more. This diagnosis is not performed when the parking brake switch is ON.</li> </ul>	19-88
		19-91
		19-94
		19-97
<ul style="list-style-type: none"> <li>Intermittent interruption in the wheel sensor</li> <li>Wheel spin by operating the parking brake while the parking brake switch is stuck OFF</li> <li>Car spun-out—(No problem)</li> </ul>	<ul style="list-style-type: none"> <li>The ABS indicator light is turned on when either or both rear wheels lock and the wheel sensor signal is missing during driving. This diagnosis is not performed when the parking brake switch is ON.</li> </ul>	19-100
	<ul style="list-style-type: none"> <li>The ABS indicator light is turned on when battery voltage is detected at the solenoid terminal before the fail-safe relays are turned on at the initial diagnosis.</li> </ul>	19-102
		19-104
		19-107
<ul style="list-style-type: none"> <li>Intermittent interruption in the solenoid valve drive circuit</li> <li>Intermittent interruption in the solenoid valve ground circuit</li> <li>Intermittent interruption in the fail-safe relay circuit</li> </ul>	<ul style="list-style-type: none"> <li>Each solenoid valve is momentarily activated at the initial diagnosis and when the car starts off. The ABS indicator light is turned on when battery voltage is detected at the solenoid terminal.</li> <li>The ABS indicator light is turned on when OV is detected at the solenoid terminal while the solenoid OFF signal is detected at the regular diagnosis.</li> </ul>	19-109
		19-113
		19-120
<ul style="list-style-type: none"> <li>Intermittent interruption in the wheel sensor</li> <li>Rough road driving—(No problem)</li> </ul>	<ul style="list-style-type: none"> <li>The ABS indicator light is turned on when the ABS functions continuously.</li> </ul>	19-127
<ul style="list-style-type: none"> <li>(No problem)</li> </ul>	<ul style="list-style-type: none"> <li>The ABS indicator light is turned on when there is a difference between the CPU data.</li> </ul>	19-128
<ul style="list-style-type: none"> <li>(No problem)</li> </ul>	<ul style="list-style-type: none"> <li>The ABS indicator light is turned on when there is a abnormality in the IC at the regular diagnosis.</li> </ul>	19-128