

BRAKES

04 SECTION

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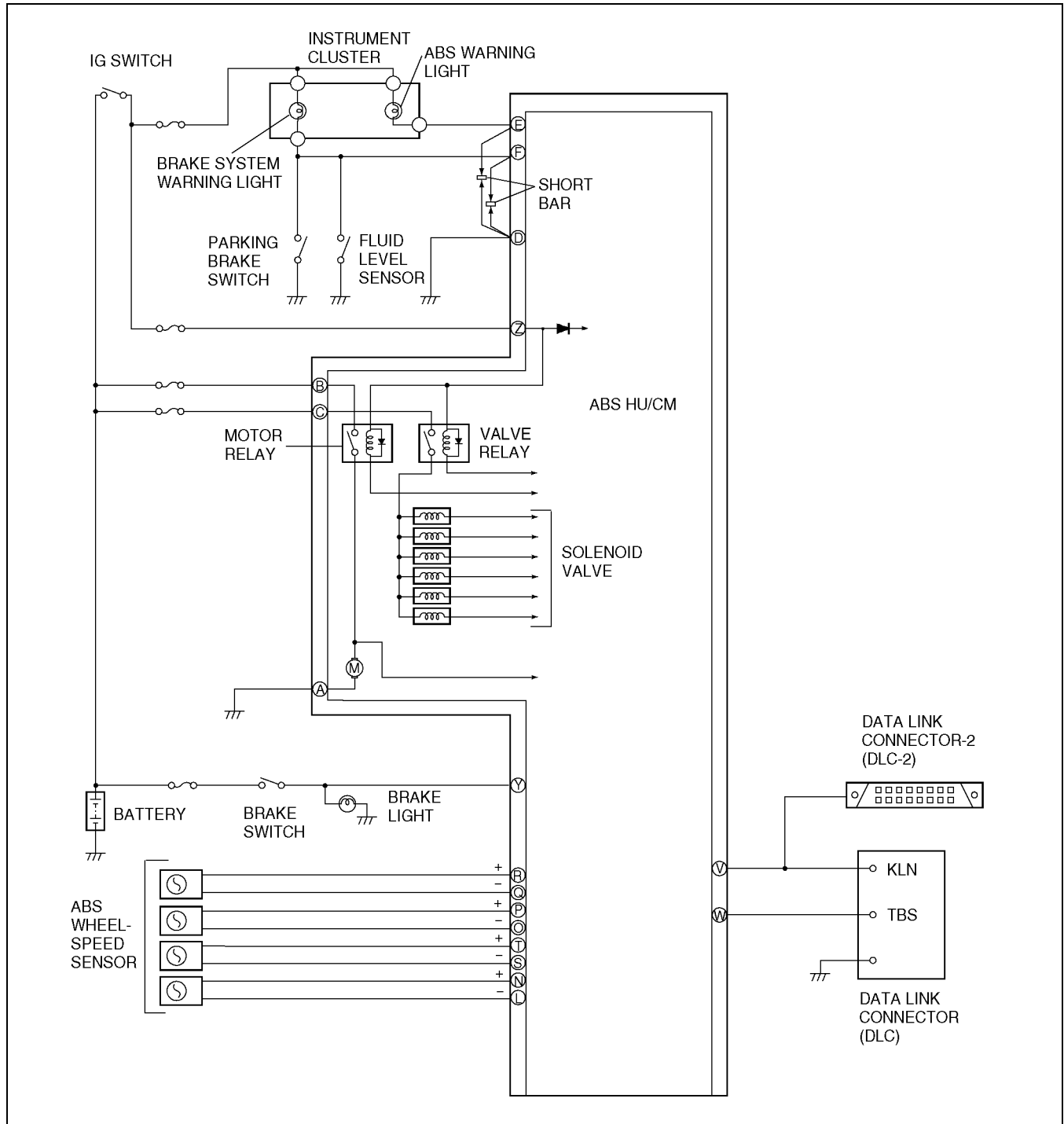
04-02

04-02 ON-BOARD DIAGNOSTIC

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ABS SYSTEM DIAGRAM

A5U040243000W01



A5U0402W002

ABS ON-BOARD DIAGNOSIS

A5U040243000W02

On-Board Diagnostic (OBD) Test Description

- The OBD test inspects the integrity and function of the ABS and outputs the results when requested by the specific tests.
- On-board diagnostic test also:
 - Provides a quick inspection of the ABS .
 - Is usually performed at the start of each diagnostic procedure.
 - Provides verification after repairs to ensure that no other faults occurred during service.
- The OBD test is divided into 3 tests:
 - Read/clear diagnostic results, PID monitor and record and active command modes.

Read/clear diagnostic results

- This function allows you to read or clear DTCs in the ABS HU/CM memory.

PID/data monitor and record

- This function allows you to access certain data values, input signals, calculated values, and system status information.

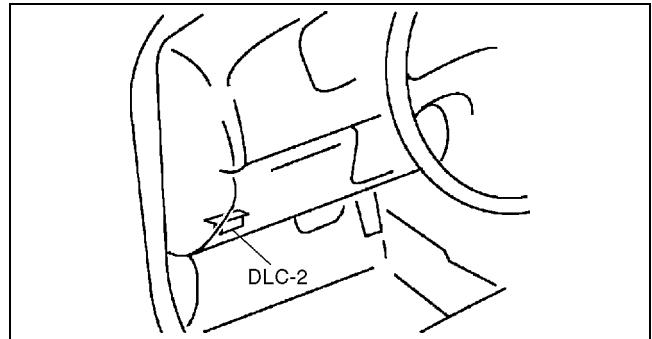
Active command modes

- This function allows you to control devices through the **SST** (WDS or equivalent).

Reading DTCs Procedure

Using SST (WDS or equivalent)

1. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located on the left side of the steering column.
2. Retrieve DTC with WDS or equivalent.



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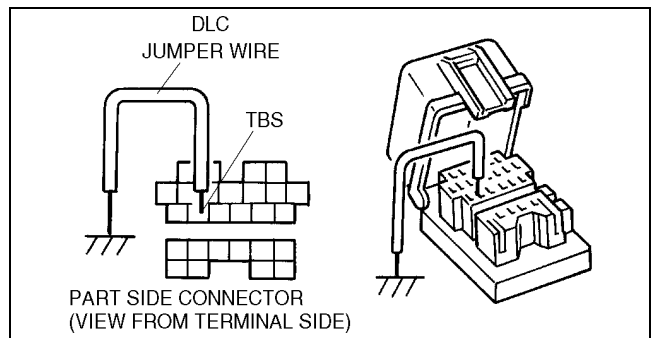
Without using SST (WDS or equivalent)

1. Connect the TBS terminal at DLC to body ground using a jumper wire.

Caution

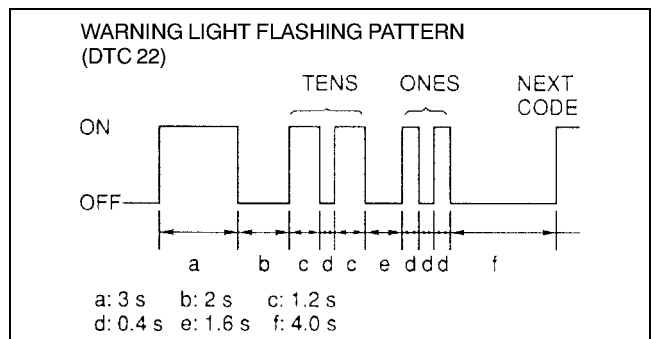
- **Connecting to the wrong DTS terminal may cause a malfunction. Carefully connect only to the specified terminal.**

2. Turn the ignition key to ON (engine OFF).



ZLU0402W103

3. After the ABS warning light illuminates for **3 seconds**, the ABS warning light indicates DTCs.
4. After completion of repairs, clear DTCs.



ZMU0402W110

Clearing DTCs Procedures

Using SST (WDS or equivalent)

After repairs have been made, perform the **Reading DTCs Procedure**.

1. Erase DTC with WDS or equivalent.

Without using SST (WDS or equivalent)

1. Connect the TBS terminal at the DLC to body ground using a jumper wire.

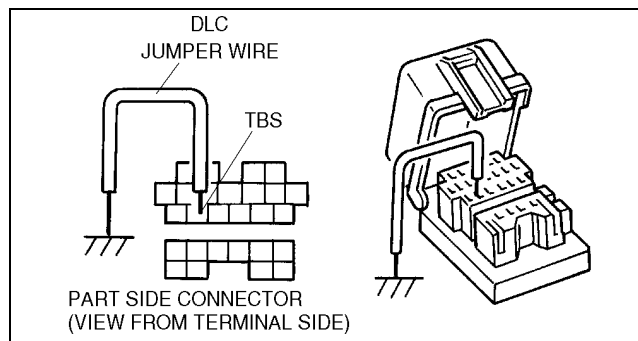
Caution

- **Connecting to the wrong DTS terminal may cause a malfunction. Carefully connect only to the specified terminal.**

2. Turn the ignition key to ON (engine OFF).
3. Output all stored DTCs.
4. After verifying that the first code is repeated, depress the brake pedal **10 times or more** at intervals of less than **1 seconds**.
5. Turn the ignition key to OFF and disconnect the jumper wire.

Note

- DTCs cannot be cleared if the following occur:
 - If intervals of depressing the brake pedal exceed **1 seconds**.
 - The brake switch has failed.



ZLU0402W103

PID/Data Monitor and Record Procedure

1. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located on the left side of the steering column.
2. Access and monitor PIDs with WDS or equivalent.











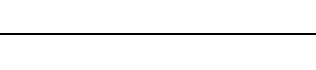
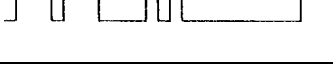


Active Command Modes Procedure

1. Connect WDS or equivalent to the vehicle DLC-2 16-pin connector located on the left side of the steering column.
2. Turn the ignition key to ON (Engine OFF) or start engine.
3. Activate active command modes with WDS or equivalent.



DTC Table

DTC		ABS warning light flashing pattern	Diagnosis system component	Page
WDS or equivalent	ABS warning light			
B1318	63		ABS HU/CM power supply	(See 04-02-8 DTC B1318 (63))
B1342	61		ABS HU/CM (CM)	(See 04-02-9 DTC B1342 (61))
B1484	05		Brake switch harness	(See 04-02-9 DTC B1484 (05))
C1095	54		ABS motor, motor relay	(See 04-02-10 DTC C1095 (54), C1096 (53))
C1096	53		ABS motor, motor relay	(See 04-02-10 DTC C1095 (54), C1096 (53))
C1145	11		Right front ABS wheel-speed sensor	(See 04-02-11 DTC C1145 (11), C1155 (12), C1165 (13), C1175 (14))

ON-BOARD DIAGNOSTIC

DTC		ABS warning light flashing pattern	Diagnosis system component	Page
WDS or equivalent	ABS warning light			
C1148	41		Right front ABS wheel-speed sensor/sensor rotor	(See 04-02-12 DTC C1148 (41), C1158 (42), C1168 (43), C1178 (44))
C1155	12		Left front ABS wheel-speed sensor	(See 04-02-11 DTC C1145 (11), C1155 (12), C1165 (13), C1175 (14))
C1158	42		Left front ABS wheel-speed sensor/sensor rotor	(See 04-02-12 DTC C1148 (41), C1158 (42), C1168 (43), C1178 (44))
C1165	13		Right rear ABS wheel-speed sensor	(See 04-02-11 DTC C1145 (11), C1155 (12), C1165 (13), C1175 (14))
C1168	43		Right rear ABS wheel-speed sensor/sensor rotor	(See 04-02-12 DTC C1148 (41), C1158 (42), C1168 (43), C1178 (44))
C1175	14		Left rear wheel-speed sensor	(See 04-02-11 DTC C1145 (11), C1155 (12), C1165 (13), C1175 (14))
C1178	44		Left rear ABS wheel-speed sensor/sensor rotor	(See 04-02-12 DTC C1148 (41), C1158 (42), C1168 (43), C1178 (44))
C1186	51		Valve relay	(See 04-02-14 DTC C1186 (51), C1266 (52))
C1194	24		Left front ABS pressure reduction solenoid valve	(See 04-02-14 DTC C1194 (24), C1198 (25), C1210 (22), C1214 (23), C1202 (26), C1206 (27))
C1198	25		Left front ABS pressure retention solenoid valve	(See 04-02-14 DTC C1194 (24), C1198 (25), C1210 (22), C1214 (23), C1202 (26), C1206 (27))
C1210	22		Right front ABS pressure reduction solenoid valve	(See 04-02-14 DTC C1194 (24), C1198 (25), C1210 (22), C1214 (23), C1202 (26), C1206 (27))
C1214	23		Right front ABS pressure retention solenoid valve	(See 04-02-14 DTC C1194 (24), C1198 (25), C1210 (22), C1214 (23), C1202 (26), C1206 (27))
C1222	15		ABS wheel-speed sensor	(See 04-02-15 DTC C1222 (15))
C1202	26		Right rear ABS pressure reduction solenoid valve	(See 04-02-14 DTC C1194 (24), C1198 (25), C1210 (22), C1214 (23), C1202 (26), C1206 (27))

ON-BOARD DIAGNOSTIC

DTC		ABS warning light flashing pattern	Diagnosis system component	Page
WDS or equivalent	ABS warning light			
C1206	27		Right rear ABS pressure retention solenoid valve	(See 04-02-14 DTC C1194 (24), C1198 (25), C1210 (22), C1214 (23), C1202 (26), C1206 (27))
C1266	52		Valve relay	(See 04-02-14 DTC C1186 (51), C1266 (52))

PID/DATA Monitor Table

PID Name (Definition)	Unit/Condition	Condition/Specification	Action	ABS HU/CM terminal
ABS_LAMP (ABS warning light output state)	ON/OFF	<ul style="list-style-type: none"> ABS warning light is illuminated: ON ABS warning light is not illuminated: OFF 	Inspect ABS warning light (See 09-22-3 INSTRUMENT CLUSTER REMOVAL/ INSTALLATION)	E
ABS_VOLT (System battery voltage value)	V	<ul style="list-style-type: none"> Ignition key at ON: B+ Idle: Aprox. 14—16 V 	Inspect power supply circuit (See 04-13-5 ABS HARNESS AND INPUT SIGNAL INSPECTION)	Z
ABSLF_I (Left front ABS pressure retention solenoid valve output state)	ON/OFF	<ul style="list-style-type: none"> During ABS control: ON/OFF (solenoid valve is activated/deactivated) Not ABS control: OFF (solenoid valve is deactivated) 	Internal fault of ABS HU/CM. Replace ABS HU/CM (See 04-13-4 ABS HU/CM REMOVAL/ INSTALLATION)	—
ABSLF_O (Left front ABS pressure reduction solenoid valve output state)	ON/OFF	<ul style="list-style-type: none"> During ABS control: ON/OFF (solenoid valve is activated/deactivated) Not ABS control: OFF (solenoid valve is deactivated) 	Internal fault of ABS HU/CM. Replace ABS HU/CM (See 04-13-4 ABS HU/CM REMOVAL/ INSTALLATION)	—
ABSPMPRLY (ABS motor relay output state)	ON/OFF	<ul style="list-style-type: none"> ABS motor relay is activated: ON ABS motor relay is deactivated: OFF 	Inspect ABS HU/CM connector and ABS HU/CM (See 04-13-2 ABS HU/CM SYSTEM INSPECTION)	—
ABSR_I (Rear ABS pressure retention solenoid valve output state)	ON/OFF	<ul style="list-style-type: none"> During ABS and/or EBD control: ON/OFF (solenoid valve is activated/deactivated) Not ABS and/or EBD control: OFF (solenoid valve is deactivated) 	Internal fault of ABS HU/CM. Replace ABS HU/CM (See 04-13-4 ABS HU/CM REMOVAL/ INSTALLATION)	—
ABSR_O (Rear ABS pressure reduction solenoid valve output state)	ON/OFF	<ul style="list-style-type: none"> During ABS and/or EBD control: ON/OFF (solenoid valve is activated/deactivated) Not ABS and/or EBD control: OFF (solenoid valve is deactivated) 	Internal fault of ABS HU/CM. Replace ABS HU/CM (See 04-13-4 ABS HU/CM REMOVAL/ INSTALLATION)	—
ABSRF_I (Right front ABS pressure retention solenoid valve output state)	ON/OFF	<ul style="list-style-type: none"> During ABS control: ON/OFF (solenoid valve is activated/deactivated) Not ABS control: OFF (solenoid valve is deactivated) 	Internal fault of ABS HU/CM. Replace ABS HU/CM (See 04-13-4 ABS HU/CM REMOVAL/ INSTALLATION)	—

ON-BOARD DIAGNOSTIC

PID Name (Definition)	Unit/Condition	Condition/Specification	Action	ABS HU/CM terminal
ABSRF_O (Right front ABS pressure reduction solenoid valve output state)	ON/OFF	<ul style="list-style-type: none"> During ABS control: ON/ OFF (solenoid valve is activated/deactivated) Not ABS control: OFF (solenoid valve is deactivated) 	Internal fault of ABS HU/ CM. Replace ABS HU/CM (See 04-13-4 ABS HU/CM REMOVAL/ INSTALLATION)	—
ABSVLVRLY (Valve relay output state)	ON/OFF	<ul style="list-style-type: none"> Ignition key at ON: ON Other condition (Power supply circuit is open): OFF 	Inspect ABS HU/CM connector and ABS HU/CM (See 04-13-2 ABS HU/CM SYSTEM INSPECTION)	—
BOO_ABS (Brake pedal switch input)	ON/OFF	<ul style="list-style-type: none"> Brake pedal is depressed: ON Brake pedal is released: OFF 	Inspect brake switch (See 04-11-5 BRAKE SWITCH INSPECTION)	Y
BRAKE_LMP (BRAKE system warning light output state)	ON/OFF	<ul style="list-style-type: none"> BRAKE system warning light is illuminated: ON BRAKE system warning light is not illuminated: OFF 	Inspect BRAKE system warning light (See 09-22-3 INSTRUMENT CLUSTER REMOVAL/ INSTALLATION)	F
CCNTABS (Number of continuous DTC)	—	<ul style="list-style-type: none"> DTC is detected: 1—255 DTC is not detected: 0 	Perform inspection using appropriate DTC (See 04-02-3 ABS ON- BOARD DIAGNOSIS)	—
LF_WSPD (Left front ABS wheel- speed sensor input)	KPH	<ul style="list-style-type: none"> Vehicle is stopped: 0 KPH Indicates vehicle speed 	Inspect ABS wheel-speed sensor/sensor rotor. (See 04-13-9 FRONT ABS WHEEL-SPEED SENSOR INSPECTION) (See 04-13-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION)	Q, R
LR_WSPD (Left rear ABS wheel- speed sensor input)	KPH	<ul style="list-style-type: none"> Vehicle is stopped: 0 KPH Indicates vehicle speed 	Inspect ABS wheel-speed sensor/sensor rotor. (See 04-13-9 FRONT ABS WHEEL-SPEED SENSOR INSPECTION) (See 04-13-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION)	S, T
PMPSTAT (ABS motor output state)	ON/OFF	<ul style="list-style-type: none"> ABS motor is activated: ON ABS motor is deactivated: OFF 	Inspect ABS HU/CM connector and ABS HU/CM (See 04-13-2 ABS HU/CM SYSTEM INSPECTION)	—
RF_WSPD (Right front ABS wheel- speed sensor input)	KPH	<ul style="list-style-type: none"> Vehicle is stopped: 0 KPH indicates vehicle speed 	Inspect ABS wheel-speed sensor/sensor rotor. (See 04-13-9 FRONT ABS WHEEL-SPEED SENSOR INSPECTION) (See 04-13-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION)	O, P
RR_WSPD (Right rear ABS wheel- speed sensor input)	KPH	<ul style="list-style-type: none"> Vehicle is stopped: 0 KPH indicates vehicle speed 	Inspect ABS wheel-speed sensor/sensor rotor. (See 04-13-9 FRONT ABS WHEEL-SPEED SENSOR INSPECTION) (See 04-13-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION)	L, N

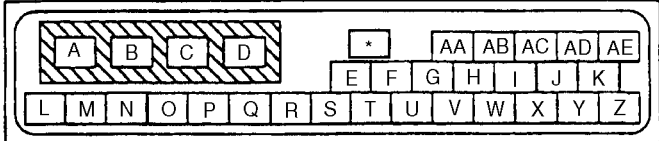
ON-BOARD DIAGNOSTIC

Active Command Modes Table

Command Name	Definition	Operation	Note
LF_INLET	Left front ABS pressure retention solenoid valve	ON/OFF	Ignition key at ON (engine OFF)
LF_OUTLET	Left front ABS pressure reduction solenoid valve	ON/OFF	
PMP_MOTOR	ABS motor	ON/OFF	
REAR INLET	Rear ABS pressure retention solenoid valve	ON/OFF	
REAR OUTLET	Rear ABS pressure reduction solenoid valve	ON/OFF	
RF_INLET	Right front ABS pressure retention solenoid valve	ON/OFF	
RF_OUTLET	Right front ABS pressure reduction solenoid valve	ON/OFF	

DTC B1318 (63)

A5U040243000W03

DTC C1318 (63)		ABS CM power supply
DETECTION CONDITION	<ul style="list-style-type: none"> Voltage at Z terminal of ABS HU/CM drops below approx. 10 V Voltage at Z terminal of ABS HU/CM rises above approx. 17 V 	
POSSIBLE CAUSE	<ul style="list-style-type: none"> Malfunction of generator Malfunction of related wiring harness Depleted battery 	
<p>ABS CM HARNESS SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)</p> 		

Diagnostic procedure

STEP	INSPECTION		ACTION
1	INSPECT BATTERY VOLTAGE <ul style="list-style-type: none"> Is battery terminal voltage okay? 	Yes	Make sure that battery terminal connection is okay. Go to next step.
		No	Charge or replace battery.
2	INSPECT BATTERY GRAVITY <ul style="list-style-type: none"> Is battery specific gravity as specified? (See 01-17-4 GENERATOR INSPECTION) 	Yes	Go to next step.
		No	Replace battery.
3	INSPECT CHARGING SYSTEM <ul style="list-style-type: none"> Are generator and drive belt tension okay? (See 01-17-4 GENERATOR INSPECTION) 	Yes	Go to next step.
		No	Adjust drive belt tension as necessary. Replace generator and/or drive belt as necessary.
4	INSPECT for ABS HU/CM CONNECTOR <ul style="list-style-type: none"> Inspect connection of Z (power supply) and D (ground) connector pins for ABS HU/CM. Is it okay? 	Yes	Go to next step.
		No	Repair ABS HU/CM connector.
5	INSPECT ABS HU/CM POWER SUPPLY VOLTAGE <ul style="list-style-type: none"> Is voltage of ABS HU/CM harness between Z and D above 10 V when engine is idling? 	Yes	Go to next step.
		No	Go to step 7.
6	INSPECT ABS HU/CM GROUND CIRCUIT FOR POOR GROUND AND OPEN CIRCUIT <ul style="list-style-type: none"> With IG SW OFF, is resistance between D of ABS HU/CM harness and secure ground less than 5 ohms? 	Yes	Go to next step.
		No	Repair harness between D and ground point for open circuit.
7	INSPECT ABS HU/CM POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT <ul style="list-style-type: none"> Is resistance between Z of ABS HU/CM harness and ABS, A/B fuse (10A) less than 5 ohms? 	Yes	Go to next step.
		No	Repair harness between Z and fuse for open circuit.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION
8	VERIFY TROUBLESHOOTING COMPLETED <ul style="list-style-type: none"> Make sure to reconnected all disconnected connectors. Clear DTC from memory. (See 04-02-4 Clearing DTCs Procedures.) Is same DTC present? 	Yes Replace ABS HU/CM, then go to next step.
		No Go to next step.
9	VERIFY AFTER REPAIR PROCEDURE <ul style="list-style-type: none"> Is there any other DTC present? 	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

DTC B1342 (61)

A5U040243000W04

DTC B1342 (61)	ABS HU/CM
DETECTION CONDITION	<ul style="list-style-type: none"> The on-board diagnostic program detects computer malfunction
POSSIBLE CAUSE	<ul style="list-style-type: none"> Malfunction of ABS HU/CM (CM)

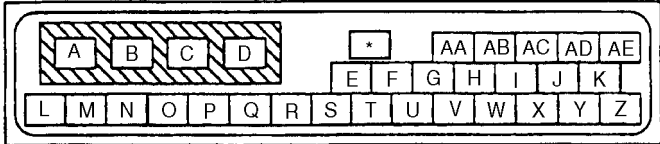
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Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY CURRENT STATUS OF MALFUNCTION <ul style="list-style-type: none"> Clear DTC memory. (See 04-02-4 Clearing DTCs Procedures.) Start engine and drive vehicle at 12 km/h {7.4 mph} or above. Is same DTC present? 	Yes Replace ABS HU/CM, then go to next step.
		No Go to next step.
2	VERIFY AFTER REPAIR PROCEDURE <ul style="list-style-type: none"> Is there any other DTC present? 	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

DTC B1484 (05)

A5U040243000W05

DTC B1484 (05)	Brake switch harness
DETECTION CONDITION	<ul style="list-style-type: none"> When open circuit detected between brake light and ABS HU/CM
POSSIBLE CAUSE	<ul style="list-style-type: none"> Open circuit between ABS HU/CM terminal Y and brake light ground Malfunction of brake light
<p>ABS CM HARNESS SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)</p> 	

Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT WIRING HARNESS BETWEEN BRAKE LIGHT AND ABS HU/CM FOR CONTINUITY <ul style="list-style-type: none"> Is B+ correctly applied to ABS HU/CM connector terminal Y when brake pedal depressed (ignition key to ON position)? 	Yes Go to next step.
		No Repair harness.
2	VERIFY TROUBLESHOOTING COMPLETED <ul style="list-style-type: none"> Clear DTC from memory. (See 04-02-4 Clearing DTCs Procedures.) Is same DTC present? 	Yes Replace ABS HU/CM, then go to next step.
		No Go to next step.
3	VERIFY AFTER REPAIR PROCEDURE <ul style="list-style-type: none"> Is there any other DTC present? 	Yes Go to applicable DTC inspection.
		No Troubleshooting completed.

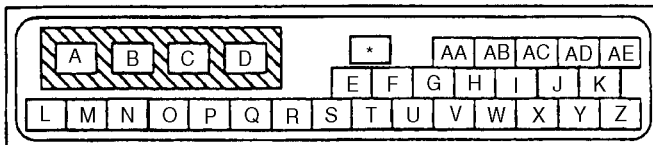
ON-BOARD DIAGNOSTIC

DTC C1095 (54), C1096 (53)

A5U040243000W06

DTC C1095 (54), C1096 (53)		ABS motor, motor relay
DETECTION CONDITION	<ul style="list-style-type: none">C1095 (54): Motor monitor signal does not track in response to motor relay at OFF commandC1096 (53): Motor monitor signal does not track in response to motor relay at ON command or when motor lock is detected	
POSSIBLE CAUSE	<ul style="list-style-type: none">Open or short to ground circuit between ABS HU/CM terminal B and batteryOpen circuit between ABS HU/CM terminal A and body groundMalfunction of ABS (60A) fuseOpen or short circuit of motor, motor lockOpen or short circuit of motor relay	

ABS CM HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)



The diagram shows a rectangular connector housing with terminals arranged in three rows. The top row contains terminals A, B, C, and D, which are grouped together in a shaded rectangular area. To the right of this group is a single terminal marked with an asterisk (*). Further right is another shaded area containing terminals AA, AB, AC, AD, and AE. The middle row contains terminals E, F, G, H, I, J, and K. The bottom row contains terminals L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, and Z.

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	CHECK FOR DTCs IN ABS HU/CM <ul style="list-style-type: none"> If any of DTC C1186 (51) and/or C1266 (52) also memorized? 	Yes	Go to DTC C1186 (51) and/or C1266 (52) chart.
		No	Go to next step.
2	INSPECT WIRING HARNESS BETWEEN ABS HU/CM POWER SUPPLY AND ABS HU/CM FOR CONTINUITY <ul style="list-style-type: none"> Is B+ correctly applied to B terminal of ABS HU/CM harness connector? 	Yes	Go to next step.
		No	Electric power is not supplied to ABS HU/CM. Inspect and repair harness.
3	VERIFY WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN ABS HU/CM AND GROUND) <ul style="list-style-type: none"> Inspect continuity between A terminal of ABS HU/CM harness connector and ground. Is there continuity? 	Yes	A terminal of ABS HU/CM is not connected to ground. Inspect and repair harness.
		No	Go to next step.
4	VERIFY TROUBLESHOOTING COMPLETED <ul style="list-style-type: none"> Make sure to reconnected all disconnected connectors. Clear DTC from memory. (See 04-02-4 Clearing DTCs Procedures.) Start engine and drive vehicle at 12 km/h {7.4 mph} or above. Gradually slow down and stop vehicle. Is same DTC present? 	Yes	Replace ABS HU/CM, then go to next step.
		No	Go to next step.
5	VERIFY AFTER REPAIR PROCEDURE <ul style="list-style-type: none"> Is there any other DTC present? 	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC C1145 (11), C1155 (12), C1165 (13), C1175 (14)

A5U040243000W07

DTC C1145 (11) C1155 (12) C1165 (13) C1175 (14)	RF ABS wheel-speed sensor LF ABS wheel-speed sensor RR ABS wheel-speed sensor LR ABS wheel-speed sensor
DETECTION CONDITION	<ul style="list-style-type: none"> When open circuit is detected
POSSIBLE CAUSE	<ul style="list-style-type: none"> Open circuit between ABS wheel-speed sensor and ABS HU/CM terminal below <ul style="list-style-type: none"> RF ABS wheel-speed sensor terminal A and ABS HU/CM terminal P RF ABS wheel-speed sensor terminal B and ABS HU/CM terminal O LF ABS wheel-speed sensor terminal A and ABS HU/CM terminal R LF ABS wheel-speed sensor terminal B and ABS HU/CM terminal Q RR ABS wheel-speed sensor terminal A and ABS HU/CM terminal N RR ABS wheel-speed sensor terminal B and ABS HU/CM terminal L LR ABS wheel-speed sensor terminal A and ABS HU/CM terminal T LR ABS wheel-speed sensor terminal B and ABS HU/CM terminal S Malfunction of ABS wheel-speed sensor

ABS CM HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

ABS WHEEL-SPEED SENSOR HARNESS
SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)

(FRONT)

(REAR)

04-02

Diagnostic procedure

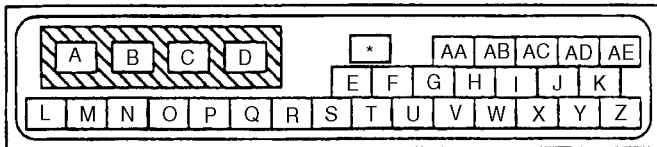
STEP	INSPECTION	ACTION
1	INSPECT ABS-WHEEL SPEED SENSOR CIRCUIT FOR CONTINUITY <ul style="list-style-type: none"> With ABS HU/CM disconnected, inspect continuity between following sensor terminals of harness connector. <ul style="list-style-type: none"> RF: P—O, RR: N—L, LF: R—Q, LR: T—S Is there continuity? 	Yes Go to Step 3.
		No Go to next step.
2	INSPECT ABS-WHEEL SPEED SENSOR (RESISTANCE) <ul style="list-style-type: none"> Disconnect ABS wheel-speed sensor connector and inspect resistance between sensor terminals. Resistance: 1.0—2.0 kilohm Is it as specified? 	Yes Repair open or short circuit between ABS HU/CM and sensor. Go to step 4.
		No Replace ABS wheel-speed sensor. Go to step 4.
3	INSPECT ABS-WHEEL SPEED SENSOR (OUTPUT VOLTAGE) <ul style="list-style-type: none"> Inspect ABS wheel-speed sensor output voltage. (See 04-13-9 FRONT ABS WHEEL-SPEED SENSOR INSPECTION) (See 04-13-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION) Is voltage okay? 	Yes Go to next step.
		No Replace ABS wheel-speed sensor. Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
4	VERIFY TROUBLESHOOTING COMPLETED <ul style="list-style-type: none"> Make sure to reconnected all disconnected connectors. Clear DTC from memory. (See 04-02-4 Clearing DTCs Procedures) Start engine and drive vehicle at 12 km/h {7.4 mph} or above. Gradually slow down and stop vehicle. Is same DTC present? 	Yes	Replace ABS HU/CM, then go to next step.
		No	Go to next step.
5	VERIFY AFTER REPAIR PROCEDURE <ul style="list-style-type: none"> Is there any other DTC present? 	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

DTC C1148 (41), C1158 (42), C1168 (43), C1178 (44)

A5U040243000W08

DTC	C1148 (41)	RF ABS wheel-speed sensor/sensor rotor
	C1158 (42)	LF ABS wheel-speed sensor/sensor rotor
	C1168 (43)	RR ABS wheel-speed sensor/sensor rotor
	C1178 (44)	LR ABS wheel-speed sensor/sensor rotor
	C1222 (15)	ABS wheel-speed sensor
DETECTION CONDITION	<ul style="list-style-type: none">Wheel speed signal is out of specification	
POSSIBLE CAUSE	<ul style="list-style-type: none">Short circuit of ABS wheel-speed sensorDamaged ABS sensor rotorMalfunction of ABS wheel-speed sensorIncorrect clearance between ABS wheel-speed sensor and sensor rotor	
<p>ABS CM HARNESS SIDE CONNECTOR (VIEW FROM TERMINAL SIDE)</p> 		

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT <ul style="list-style-type: none"> Turn ignition key to OFF. Connect SST (WDS or equivalent) to DLC-2. Access LF_WSPD, LR_WSPD, RF_WSPD and RR_WSPD PID using SST (WDS or equivalent) Start engine and drive vehicle. Are PIDs display vehicle speed and 4 PIDs equal? 	Yes	Go to Step 5.
		No	Go to next step.
2	INSPECT ABS WHEEL-SPEED SENSOR CIRCUIT FOR SHORT TO GROUND <ul style="list-style-type: none"> Turn ignition key to OFF. Disconnect ABS HU/CM connector. Inspect continuity between suspected sensor terminal(s) and ground(s). <ul style="list-style-type: none"> RF ABS wheel-speed sensor: P LF ABS wheel-speed sensor: R RR ABS wheel-speed sensor: N LR ABS wheel-speed sensor: T Is there continuity? 	Yes	Go to Step 4.
		No	Go to next step.

ON-BOARD DIAGNOSTIC

STEP	INSPECTION	ACTION	
3	INSPECT ABS WHEEL-SPEED SENSOR FOR SHORT TO GROUND <ul style="list-style-type: none"> With ignition key at OFF, disconnected suspected sensor connector(s), inspect continuity between suspected sensor terminal(s) A (part side) and ground(s). Is there continuity? 	Yes	Replace ABS wheel-speed sensor(s), then go to Step 7.
		No	Repair or replace harness (short to ground) between ABS HU/CM and ABS wheel-speed sensor connector(s), then go to Step 7.
4	INSPECT SENSOR ROTOR CLEARANCE <ul style="list-style-type: none"> Jack-up vehicle and support it with safety stands. Remove suspected wheel(s). Inspect clearance between sensor and rotor. Is clearance within 0.3—1.1 mm {0.012—0.043 in}? 	Yes	Go to next step.
		No	Replace ABS wheel-speed sensor(s), then go to Step 7.
5	INSPECT ABS WHEEL-SPEED SENSOR OUTPUT PULSE <ul style="list-style-type: none"> Start engine and drive vehicle. Inspect output voltage pattern using an oscilloscope. (See 04-13-9 Voltage Inspection.) (See 04-13-10 REAR ABS WHEEL-SPEED SENSOR INSPECTION.) Is output voltage pattern okay? 	Yes	Go to Step 7.
		No	Go to next step.
6	INSPECT SENSOR ROTOR FOR DAMAGE <ul style="list-style-type: none"> Jack-up vehicle and support it with safety stands. Remove suspected wheel(s). Visually inspect sensor rotor for missing, deformed and obstructed teeth. Number of teeth: 44 Is sensor rotor okay? 	Yes	Go to next step.
		No	Replace rotor, then go to Step 7.
7	VERIFY TROUBLESHOOTING COMPLETED <ul style="list-style-type: none"> Make sure to reconnected all disconnected connectors. Clear DTC from memory. (See 04-02-4 Clearing DTCs Procedures.) Start engine and drive vehicle at 12 km/h {7.4 mph} or above. Gradually slow down vehicle and stop. Is same DTC present? 	Yes	Replace ABS HU/CM, then go to next step.
		No	Go to next step.
8	VERIFY AFTER REPAIR PROCEDURE <ul style="list-style-type: none"> Is there any other DTC present? 	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

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ON-BOARD DIAGNOSTIC

DTC C1194 (24), C1198 (25), C1210 (22), C1214 (23), C1202 (26), C1206 (27)

A5U040243000W09

DTC	C 1194 (24) C 1198 (25) C 1202 (26) C 1206 (27) C 1210 (22) C 1214 (23)	LF pressure reduction valve LF pressure retention valve R pressure reduction valve R pressure retention valve RF pressure reduction valve RF pressure retention valve
	DETECTION CONDITION	<ul style="list-style-type: none"> Solenoid monitor signal does not track in response to solenoid ON/OFF command
POSSIBLE CAUSE	<ul style="list-style-type: none"> Malfunction of solenoid valve 	

Diagnostic procedure

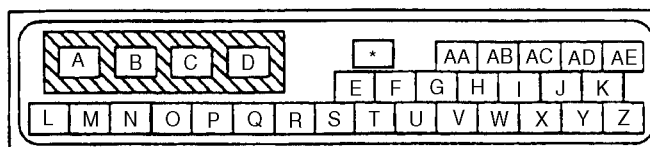
STEP	INSPECTION	ACTION
—	—	Replace ABS HU/CM component.

DTC C1186 (51), C1266 (52)

A5U040243000W10

DTC	C1186 (51), C1266 (52)	Valve relay power supply
DETECTION CONDITION	<ul style="list-style-type: none"> C1186 (51): Relay monitor signal does not track in response to valve relay at ON command C1266 (52): Relay monitor signal does not track in response to valve relay at OFF command 	
POSSIBLE CAUSE	<ul style="list-style-type: none"> Open or short to ground circuit between ABS HU/CM terminal C and battery. Malfunction of ABS (20A) fuse Open or short circuit of valve relay 	

ABS CM HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)



Diagnostic procedure

STEP		INSPECTION	ACTION
1	INSPECT WIRING HARNESS BETWEEN ABS HU/CM POWER SUPPLY AND ABS HU/CM FOR CONTINUITY <ul style="list-style-type: none">Is B+ correctly applied to C terminal of ABC HU/CM harness connector?	Yes	Go to next step.
		No	Electric power is not supplied to ABS HU/CM. Inspect and repair harness of fuse (ABS 20A). Go to next step.
2	VERIFY TROUBLESHOOTING COMPLETED <ul style="list-style-type: none">Make sure to reconnected all disconnected connectors.Clear DTC from memory. (See04-02-4 Clearing DTCs Procedures.)Is same DTC present?	Yes	Replace ABS HU/CM, then go to next step.
		No	Go to next step.
3	VERIFY AFTER REPAIR PROCEDURE <ul style="list-style-type: none">Is there any DTC present?	Yes	Go to applicable DTC inspection.
		No	Troubleshooting completed.

ON-BOARD DIAGNOSTIC

DTC C1222 (15)

A5U040243000W11

DTC C1222 (15)		ABS wheel-speed sensor
DETECTION CONDITION	<ul style="list-style-type: none"> Wheel speed signal is out of specification 	
POSSIBLE CAUSE	<ul style="list-style-type: none"> Malfunction of ABS wheel-speed sensor Damaged ABS sensor rotor 	

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> Inspect clearance between sensor and rotor, and output voltage. See 04-13-9 FRONT ABS WHEEL-SPEED SENSOR INSPECTION Is sensor okay? 	Yes	Go to next step.
		No	Replace ABS wheel-speed sensor.
2	<ul style="list-style-type: none"> Inspect wheel bearing play. See 03-11-1 WHEEL HUB, STEERING KNUCKLE PRE-INSPECTION Is wheel bearing play within specification? — Wheel bearing play 0.05 mm {0.002 in} max. 	Yes	Go to next step.
		No	Repair or replace damaged part.
3	<ul style="list-style-type: none"> Visually inspect sensor rotor for missing, deformation and obstruction of teeth. Is there looseness or damage? 	Yes	Replace ABS sensor rotor.
		No	Go to next step.
4	<ul style="list-style-type: none"> Connect the SST (WDS or equivalent) Select PID WSPD of appropriate wheel Drive vehicle and note PID Is PID active? 	Yes	System is normal.
		No	Inspect poor connection in ABS HU/CM connector and poor contact in ABS CM wheel-speed sensor terminals. Repair or replace terminal as necessary.

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