

DTC C1275 G SENSOR-SIGNAL**DTC DETECTING CONDITION** E03E9EF1

DTC No	Condition	Possible Cause
C1275	<ul style="list-style-type: none"> - When vehicle speed is more than 10km/h and the brake light switch is off, ' G > 0.5G' for 20sec continuously. - When ' min. wheel speed / dt ≥ 0.2G and G ≤ 0.1G' for 60sec continuously. 	<ul style="list-style-type: none"> - Open/short in G-sensor circuit. - Faulty G-sensor - Faulty installing of G-sensor - Faulty HECU

FAILSAFE FUNCTION

Only the ABS, TCS(ESP) functions are inhibited. The ABS, TCS(ESP) warning lamps are ON, but the EBD warning lamp OFF.

INSPECTION PROCEDURE E89704AC

1. CHECK OPEN/SHORT IN CIRCUIT OF G-SENSOR.

- 1) Turn the ignition switch ON.
- 2) Measure the output voltage between terminals 2(+) and 3(-) of the G-sensor connector.

Is the voltage within 0.6V ~ 4.5V?

NO

- ▶ Repair an open or short in the circuit between the G-sensor and the HECU.

YES

- ▶ Check installing of G-sensor

2. CHECK INSTALLING OF G-SENSOR

Visually check for the installing of the G-sensor.

Be sure to install the G-sensor with the arrow mark to be facing forward direction.

Is it installed correctly?

NO

- ▶ Reinstall the G-sensor and recheck.

YES

- ▶ Check output voltage in G-sensor connector

Brake Warning Lamp Is Abnormal

EJKD223A

1. CHECK PARKING BRAKE SWITCH CIRCUIT



NG	Repair or replace parking brake switch circuit.
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EJKD223B

2. CHECK BRAKE OIL LEVEL WARNING SWITCH CIRCUIT



NG	Repair or replace brake oil level warning switch circuit.
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EJKD223C

3. CHECK BRAKE WARNING LAMP CIRCUIT IN CLUSTER



NG	Repair or replace the instrument cluster.
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EJKD223D

4. CHECK FOR OPEN OR SHORT CIRCUIT IN HARNESS AND CONNECTOR



NG	Repair or replace the harness and connector.
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Replace the ABS control module and recheck.

EJKD223E

DTC C1101 BATTERY VOLTAGE OUT OF RANGE (OVER-VOLTAGE FAULT)**DESCRIPTION** E65EC6D4

This code shows in case that the power source for the HECU drops lower than or rises higher than the specified value.

If the power source returns within the specified value, this code will not show any longer.

CAUTION

Before carrying out the following inspection, check and recharge, if necessary, the battery.

DTC DETECTING CONDITION E81E34DA

DTC No	Condition	Possible Cause
C1101 (High Voltage) C1102 (Low Voltage)	<p>High Voltage:</p> <ol style="list-style-type: none"> 1. When Vign more than $16\pm 0.5V$ is continued for 500msec. 2. When Vign more than $19\pm 0.5V$ is continued for 49msec. 3. if the voltage recover normal operating range, the controller is reset <p>Low Voltage :</p> <ol style="list-style-type: none"> 1. When Vign more than $16\pm 0.5V$ is continued for 500msec. 2. When Vign more than $19\pm 0.5V$ is continued for 49msec. 3. if the voltage recover normal operating range, the controller is reset 1. When Vign less than $9.5V\pm 0.5V$ is continued for 500msec during Vref more than or equal to 7Km/h. 2. When Vign less than $8.5V\pm 0.5V$ is continued for 500msec during Vref less than or equal to 7Km/h or ABS, TCS(ESP) control. 3. When Vign less than $7.2V\pm 0.5V$ is continued for 28msec. 4. If IGN voltage is recovered to normal operating voltage, the system recovers to normal state. 	<ul style="list-style-type: none"> - Open/short in power supply circuit - Faulty power source - Faulty HECU

FAILSAFE FUNCTION**High voltage :**

The system stops. the ABS, TCS(ESP) and the EBD functions are inhibited. The ABS, TCS(ESP) and the EBD warning lamps are ON. The valve relay and all solenoids are OFF.

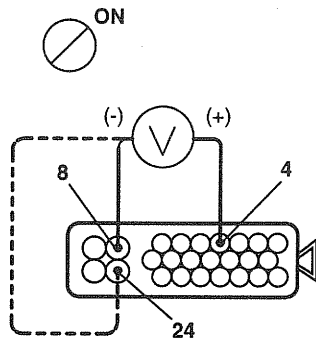
Low voltage :

1. Without the ABS control : inhibit the ABS, TCS(ESP) control of front wheels and allow the ABS control of rear wheels, deactivating the motor, and the ABS, TCS(ESP) warning lamps are switched on. When the voltage recover to the normal operating range, enable ABS function and ABS, TCS(ESP) warning lamps are switched off and erase the error code
2. With the ABS control : inhibit ABS control of the front wheels and allow ABS control of the rear wheels, deactivating the motor. the ABS, TCS(ESP) warning lamps are directly switched on and the state keeps continuously. the error code is always stored.

INSPECTION PROCEDURE EDF0B167**1. CHECK POWER BETWEEN TERMINAL OF HECU CONNECTOR.**

- 1) Disconnect the connector from the ABS control module, and then turn the ignition switch ON.
- 2) Measure the voltage between terminals 4(+) and 8(-) or 24(-) of the HECU connector.

Specification: 9.4~17V



EJQE900H

Is the voltage within the specification?

YES

▶ Check the HECU connector. If no error is found, replace the HECU and recheck.

NO

▶ Check battery.

2. CHECK BATTERY.

Measure the voltage between positive(+) and negative(-) terminals of the battery.
Is the voltage below 9.4V?

YES

▶ Check and replace the battery.

NO

▶ Check circuit for continuity between battery and HECU.

3. CHECK CIRCUIT FOR CONTINUITY BETWEEN BATTERY AND HECU.

Check the resistance between terminal 4(+) of the HECU connector and battery positive(+) terminal.
Is the resistance below 1Ω?

NO

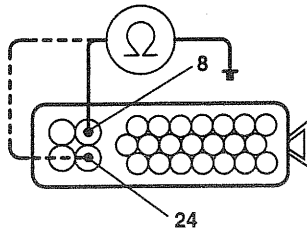
▶ Repair harness or connector.

YES

▶ Check circuit for continuity between the HECU and body ground.

4. CHECK CIRCUIT FOR CONTINUITY BETWEEN THE HECU AND BODY GROUND.

Measure the resistance between terminals 8(-), 24(-) of the HECU connector and the body ground.



EJQE900J

Is the resistance below 1Ω ?

NO

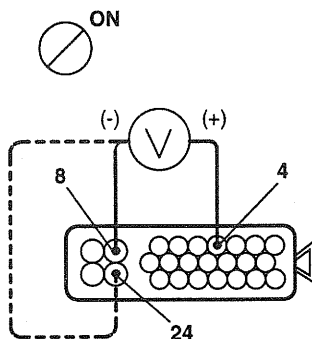
▶ Check and readjust the installing of the body ground.

YES

▶ Check voltage between the HECU connector.

5. CHECK VOLTAGE BETWEEN THE HECU CONNECTOR.

- 1) Turn the ignition switch ON.
- 2) Measure the voltage between terminals 4(+) and 8(-), 24(-) of the HECU connector.



EJQE900H

Is the voltage above 17V?

YES

▶ Repair and replace, if necessary, the charging system.

NO

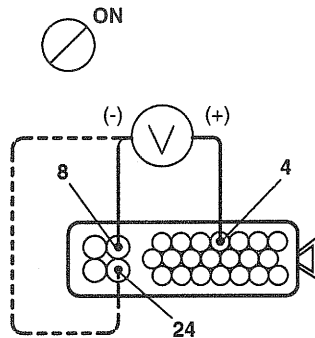
▶ Repeat the inspection procedure.

DTC C1102 BATTERY VOLTAGE OUT OF RANGE (UNDER-VOLTAGE FAULT)**INSPECTION PROCEDURE** EC7F88BFD

1. CHECK POWER BETWEEN TERMINAL OF HECU CONNECTOR.

- 1) Disconnect the connector from the ABS control module, and then turn the ignition switch ON.
- 2) Measure the voltage between terminals 4(+) and 8(-) or 24(-) of the HECU connector.

Specification: 9.4~17V



EJQE900H

Is the voltage within the specification?

YES

▶ Check the HECU connector. If no error is founded, replace the HECU and recheck.

NO

▶ Check battery.

2. CHECK BATTERY.

Measure the voltage between positive(+) and negative(-) terminals of the battery.
Is the voltage below 9.4V?

YES

▶ Check and replace the battery.

NO

▶ Check circuit for continuity between battery and HECU.

3. CHECK CIRCUIT FOR CONTINUITY BETWEEN BATTERY AND HECU.

Check the resistance between terminal 4(+) of the HECU connector and battery positive(+) terminal.
Is the resistance below 1Ω?

NO

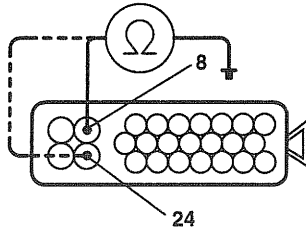
▶ Repair harness or connector.

YES

▶ Check circuit for continuity between the HECU and body ground.

4. CHECK CIRCUIT FOR CONTINUITY BETWEEN THE HECU AND BODY GROUND.

Measure the resistance between terminals 8(-), 24(-) of the HECU connector and the body ground.



EJQE900J

Is the resistance below 1Ω?

NO

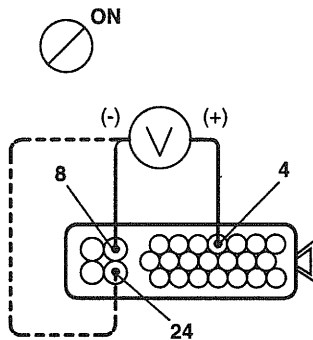
▶ Check and readjust the installing of the body ground.

YES

▶ Check voltage between the HECU connector.

5. CHECK VOLTAGE BETWEEN THE HECU CONNECTOR.

- 1) Turn the ignition switch ON.
- 2) Measure the voltage between terminals 4(+) and 8(-), 24(-) of the HECU connector.



EJQE900H

Is the voltage above 17V?

YES

▶ Repair and replace, if necessary, the charging system.

NO

▶ Repeat the inspection procedure.

DTC C1200 FRONT LEFT WHEEL SPEED SENSOR OPEN OR SHORT TO GROUND**DESCRIPTION** E9B45F66

The HECU receives wheel speed signals from the four wheel speed sensors.

The wheel signals are converted to voltage signals by the signal converting circuit and given as input to the HECU.

The HECU checks an open or short in the circuit of the wheel speed sensor.

If more than one wheel speed sensor malfunctions, the system stops.

DTC DETECTING CONDITION E4C4AD7A

DTC No	Condition	Possible Cause
C1200 (FL) C1203 (FR) C1206 (RL) C1209 (RR)	If the sensor signal current is continuously out of the specified range of 4 mA \pm 10% ~ 22 mA \pm 10% for 140msec, the failure is detected.	- Open/short in circuit of wheel speed sensor - Faulty wheel speed sensor - Faulty HECU

FAILSAFE FUNCTION**Sensor malfunction without ABS control :**

- One wheel sensor malfunction

Only the ABS, TCS(ESP) functions are inhibited. the ABS, TCS(ESP) warning lamps are ON, but the EBD warning lamp is OFF.

- More than two wheels malfunction

The system stops. the ABS, TCS(ESP) and the EBD functions are inhibited. the ABS, TCS(ESP) and the EBD warning lamps are ON. The valve relay and all solenoids are OFF.

Sensor malfunction with ABS control :

- One front wheel malfunction

Inhibit the ABS control of a wheel with a malfunctioning sensor and maintain the ABS control of other wheels.

After the ABS control has completed, the ABS, TCS(ESP) functions are inhibited. The ABS, TCS(ESP) warning lamps are ON but the EBD warning lamp is OFF.

- One rear wheel malfunction

Inhibit ABS control of both front wheels and the pressure of both rear wheels is decreased. After the controller completes the ABS control, Only the ABS, TCS(ESP) functions are inhibited. The ABS, TCS(ESP) warning lamps are ON but the EBD warning lamp is OFF.

- More than two wheels malfunction

The system stops. the ABS, TCS(ESP) and the EBD functions are inhibited. The ABS, TCS(ESP) and the EBD warning lamps are ON. The valve relay and all solenoids are OFF.

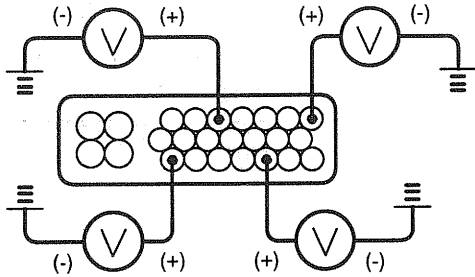
INSPECTION PROCEDURE EABB738B

1. CHECK POWER FOR WHEEL SPEED SENSOR

Measure the voltage between an appropriate wheel sensor(+) terminal and the body ground (see the table below).

DTC	Terminal
C1200 (Font-left)	1
C1203 (Font-right)	19
C1206 (Rear-right)	5
C1209 (Rear-right)	23

Specification: Battery positive(+)



KJQE900K

Is the voltage within the specification?

NO

▶ Repair short to power in the (+) circuit between the HECU and the appropriate wheel sensor.

YES

▶ Check output of the wheel speed sensor

2. CHECK OUTPUT OF THE WHEEL SPEED SENSOR

Check the volrange between terminals (see the table below) of the HECU and the body ground.

DTC	Terminal
C1200 (Font-left)	2
C1203 (Font-right)	20
C1206 (Rear-right)	6
C1209 (Rear-right)	

Specification: 0.4~2.2V

Is the voltage within the specification?

YES

▶ Replace the wheel sensor and recheck.

NO

▶ Repair the wire between the HECU and the wheel speed sensor.

DTC C1201 FRONT LEFT WHEEL SPEED SENSOR SIGNAL ERROR**DESCRIPTION** E0AE6F1C

This code shows in case that a speed signal from any of the 4 wheel speed sensors does not match to the others at any speed.

DTC DETECTING CONDITION

DTC No	Condition	Possible Cause
C1201 (FL) C1204 (FR) C1207 (RL) C1210 (RR)	<p>Speed Jump : This monitoring is performed for the period that the velocity of each wheel exceeds 2km/h.</p> <ul style="list-style-type: none"> - Controller counts the number of the wheel acceleration of 100g[(25km/h) for 7ms]. When the numbers at one wheel exceed 56 times, or When the numbers at more two wheels exceed 5 times, controller recognize the failure. - Controller counts the number of the wheel acceleration of 40g[(10km/h) for 7ms]. When the numbers at one wheel exceed 126 times, or When the numbers at more two wheels exceed 20 times, controller recognize the failure. - Controller counts the number of the wheel deceleration of -100g[(-25km/h) for 7ms]. When the numbers at each wheel exceed 56 times, controller recognize the failure. - The wheel deceleration of -100g[(-25km/h) for 7ms] causes the controller to start monitoring this failure and to compare the wheel velocity with the vehicle velocity from next cycle. When its difference of -100g is continued for more than 140msec, controller recognize the failure. - In case that any sensor failure at other wheel was already detected, When the numbers of 100g at each wheel exceed 5 times, or When the numbers of 40g at each wheel exceed 20 times, controller recognize the failure. - The counter of speed jump is cleared every 30min. <p>Wrong Exciter :</p> <ul style="list-style-type: none"> - Controller counts the number of the wheel acceleration of 100g[(25km/h) for 7ms]. When the numbers at one wheel exceed 56 times, or When the numbers at more two wheels exceed 5 times, controller recognize the failure. - Controller counts the number of the wheel acceleration of 40g[(10km/h) for 7ms]. When the numbers at one wheel exceed 126 times, or When the numbers at more two wheels exceed 20 times, controller recognize the failure. - Controller counts the number of the wheel deceleration of -100g[(-25km/h) for 7ms]. When the numbers at each wheel exceed 56 times, controller recognize the failure. - The wheel deceleration of -100g[(-25km/h) for 7ms] causes the controller to start monitoring this failure and to compare the wheel velocity with the vehicle velocity from next cycle. When its difference of -100g is continued for more than 140msec, controller recognize the failure. - In case that any sensor failure at other wheel was already detected, When the numbers of 100g at each wheel exceed 5 times, or When the numbers of 40g at each wheel exceed 20 times, controller recognize the failure. - The counter of speed jump is cleared every 30min. - Max. wheel velocity exceeds 20km/h and the wheel velocity is 40% of max. wheel velocity. if this condition is lasted for 2 minutes. - Max. wheel velocity exceeds 40km/h and the wheel velocity is 60% of max. wheel velocity. if this condition is lasted for 2 minutes. - Faulty installing of wheel speed sensor 	<ul style="list-style-type: none"> - Open/short in circuit of wheel speed sensor - Faulty wheel speed sensor - Faulty rotor or wheel bearing - Faulty HECU

FAILSAFE FUNCTION**Sensor malfunction without ABS control :**

- One wheel sensor malfunction

Only the ABS, TCS(ESP) functions are inhibited. the ABS, TCS(ESP) warning lamps are ON, but the EBD warning lamp is OFF.

- More than two wheels malfunction

The system stops. the ABS, TCS(ESP) and the EBD functions are inhibited. the ABS, TCS(ESP) and the EBD warning lamps are ON. The valve relay and all solenoids are OFF.

Sensor malfunction with ABS control :

- One front wheel malfunction

Inhibit the ABS control of a wheel with a malfunctioning sensor and maintain the ABS control of other wheels.

After the ABS control has completed, the ABS, TCS(ESP) functions are inhibited. The ABS, TCS(ESP) warning lamps are ON and the EBD warning lamp is OFF.

- One rear wheel malfunction

Inhibit ABS control of both front wheels and the pressure of both rear wheels is decreased.

After the controller completes the ABS control, Only the ABS, TCS(ESP) functions are inhibited. The ABS, TCS(ESP) warning lamps are ON and the EBD warning lamp is OFF.

- More than two wheels malfunction.

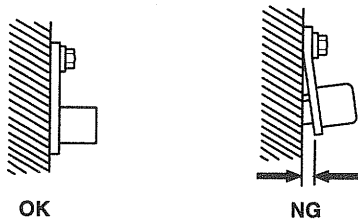
The system stops. the ABS, TCS(ESP) and the EBD functions are inhibited. The ABS, TCS(ESP) and the EBD warning lamps are ON. The valve relay and all solenoids are OFF.

INSPECTION PROCEDURE ED2816B9

1. CHECK AIR GAP BETWEEN WHEEL SPEED SENSOR AND TONE WHEEL.

Visually check the installing of wheel speed sensors and rotors(see the table below)

Specification : 0.5~1.5mm



EJQE900L

DTC	Appropriate wheel sensor
C1201	Front - left wheel sensor
C1204	Front - right wheel sensor
C1207	Rear- left wheel sensor
C1210	Rear- right wheel sensor

NOTE

The mounting bolt shall be tightened properly and there is no clearance is allowed between the sensor and front steering knuckle or rear axle carrier.

Is the air gap within the specification?

NO

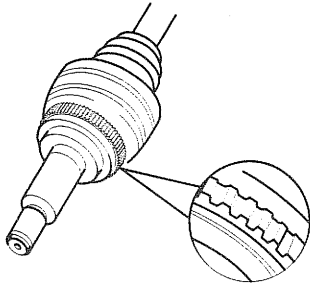
▶ Reinstall or replace, if necessary, wheel speed sensors in trouble.

YES

▶ Check sensor rotor and sensor tip.

2. CHECK SENSOR ROTOR AND SENSOR TIP

Check visually the sensor rotor and the sensor tip have scratches, missing teeth or foreign objects.



EJQE900M

Is it normal?

NO

- 1) Remove foreign objects from the sensor rotor and tip.
- 2) Replace the sensor rotor or the wheel speed sensor.

YES

► After clearing the DTC and driving the vehicle at 40km/h speed or more, if the TCS(ESP) lamp is ON and the same DTC shows again, replace the HECU and recheck.

DTC C1202 WHEEL SPEED SENSOR FR-LH INVALID/NO SIGNAL**DESCRIPTION** E7E79FBC

This code shows in case that there is no signal from any of the wheel speed sensors caused by an air gap, etc.

DTC DETECTING CONDITION E37C66C4

DTC No	Condition	PossibleCause
C1202 (FL) C1205 (FR) C1208 (RL) C1211 (RR)	<p>Large AirGap :</p> <p>This monitoring is performed for the period that the minimum velocity rises from 2km/h to 10km/h.</p> <ul style="list-style-type: none"> - When the minimum wheel velocity is 2km/h and the velocity of other wheels exceed 10km/h with the less than acceleration of 0.4g, the controller start comparing the velocity of other wheels except the min. wheel. if their difference below 4km/h is continued for 140msec, Otherwise, if their difference beyond 4km/h or more than 0.4g is continued for 2 minutes. - In < 0.4g, when the velocity of more than two wheels is 2km/h and the max. wheel velocity exceeds 10km/h, the condition is continued for 20 sec. Otherwise, In more than 0.4g, the condition is 2 minutes. - After velocity of 4 wheel exceeds 10km/h, when velocity of 1 wheel or 2 wheel is 2km/h and difference of other 2 wheel velocity is less than 4km/h under that those velocity is more than 10km/h, if that conditions are continued for 12 seconds. <p>Long Term ABS mode :</p> <ul style="list-style-type: none"> - When the minimum wheel velocity is 2km/h and the velocity of other wheels exceed 10km/h with the less than acceleration of 0.4g, the controller start comparing the velocity of other wheels except the min. wheel. if their difference below 4km/h is continued for 140msec, Otherwise, if their difference beyond 4km/h or more than 0.4g is continued for 2 minutes. - In < 0.4g, when the velocity of more than two wheels is 2km/h and the max. wheel velocity exceeds 10km/h, the condition is continued for 20 sec. Otherwise, In more than 0.4g, the condition is 2 minutes. - After velocity of 4 wheel exceeds 10km/h, when velocity of 1 wheel or 2 wheel is 2km/h and difference of other 2 wheel velocity is less than 4km/h under that those velocity is more than 10km/h, if that conditions are continued for 12 seconds. - During the ABS control cycle, if the wheel velocity of 2km/h is lasted for more than 12sec. - If the ABS control cycle is continued for more than 36sec. 	<ul style="list-style-type: none"> - Faulty installing of wheel speed sensor - Open/short in circuit of wheel speed sensor - Faulty wheel speed sensor - Faulty rotor or wheel bearing - Faulty HECU

FAILSAFE FUNCTION**Sensor malfunction without ABS control :**

- One wheel sensor malfunction

Only the ABS, TCS(ESP) functions are inhibited. the ABS, TCS(ESP) warning lamps are ON, but the EBD warning lamp is OFF.

- More than two wheels malfunction

The system stops. the ABS, TCS(ESP) and the EBD functions are inhibited. the ABS, TCS(ESP) and the EBD warning

lamps are ON. The valve relay and all solenoids are OFF.

Sensor malfunction with ABS control :

- One front wheel malfunction

Inhibit the ABS control of a wheel with a malfunctioning sensor and maintain the ABS control of other wheels.

After the ABS control has completed, the ABS, TCS(ESP) functions are inhibited. The ABS, TCS(ESP) warning lamps are ON and the EBD warning lamp is OFF.

- One rear wheel malfunction

Inhibit ABS control of both front wheels and the pressure of both rear wheels is decreased.

After the controller completes the ABS control, Only the ABS, TCS(ESP) functions are inhibited. The ABS, TCS(ESP) warning lamps are ON and the EBD warning lamp is OFF.

- More than two wheels malfunction.

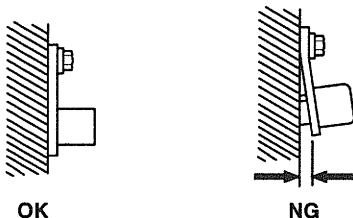
The system stops. the ABS, TCS(ESP) and the EBD functions are inhibited. The ABS, TCS(ESP) and the EBD warning lamps are ON. The valve relay and all solenoids are OFF.

INSPECTION PROCEDURE EAD8C340

1. CHECK AIR GAP BETWEEN WHEEL SPEED SENSOR AND TONE WHEEL.

Visually check the installing of wheel speed sensors and rotors(see the table below).

Specification : 0.5~1.5mm



EJQE900L

DTC	Appropriate wheel sensor
C1202	Front - left wheel sensor
C1205	Front - right wheel sensor
C1208	Rear- left wheel sensor
C1211	Rear- right wheel sensor

NOTE

The mounting bolt shall be tightened properly and there is no clearance is allowed between the sensor and front steering knuckle or rear axle carrier.

Is the air gap within the specification?

NO

▶ Reinstall or replace if necessary, wheel speed sensors in trouble.

YES

▶ Check resistance between terminals of wheel speed sensor.

2. CHECK RESISTANCE BETWEEN TERMINALS OF WHEEL SPEED SENSOR.

- 1) Disconnect the HECU connector.
- 2) Measure the resistance between wheel speed sensors(+) and (-) circuit terminals(see the table below).

DTC	TERMINAL	
	(+)side	(-)side
C1202 (Front - left)	1	2
C1205 (Front - right)	19	20
C1208 (Rear - left)	5	6
C1211 (Rear - right)	23	22

Is the resistance within less than 1Ω?

YES

- 1) There is a short in the circuit between the HECU and the wheel speed sensor.
- 2) Replace the wheel speed sensor.

NO

▶ Check speed of each wheel.

3. CHECK SPEED OF EACH WHEEL

Check if the speed of each of four wheel properly represents the speed of a vehicle, increasing the speed of the vehicle till 60km/h.

Is the speed of each wheel the same as that of the vehicle?

NO

- 1) Check any foreign objects on the rotor of the wheel in trouble.
- 2) Check if the rotor is genuine.

YES

After cleaning the DTC and driving the vehicle at 40 km/h speed or more, if the ABS warning lamp is ON and the same DTC shows again, replace the HECU and recheck.

DTC C1604 ECU HARDWARE ERROR**DTC DETECTING CONDITION** E83D1CE8

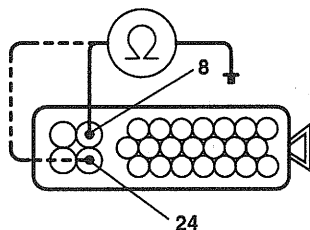
DTC No	Condition	Possible Cause
C1604	<ul style="list-style-type: none"> - When the MCU can't erase or write a data of the EEPROM. - If the master/slave processor detects abnormal operation in RAM, status register, interrupt, timer, A/D converter and cycle time. 	<ul style="list-style-type: none"> - EEPROM Failure of HECU - MCU failure of HECU

FAILSAFE FUNCTION

The system stops. the ABS, TCS(ESP) and the EBD functions are inhibited. The ABS, TCS(ESP) and the EBD warning lamps are ON. The valve relay and all solenoids are OFF.

INSPECTION PROCEDURE EB6ACBE6

1. CHECK CIRCUIT FOR CONTINUITY BETWEEN THE HECU AND BODY GROUND.



EJQE900J

Measure the resistance between terminals 8(-), 24(-) of the HECU connector and the body ground.

Is the resistance below 1Ω?

NO

- ▶ Check and readjust the installing of the body ground.

YES

- ▶ After cleaning the DTC and driving the vehicle at 40 km/h speed or more, if the ABS warning lamp is ON and the same DTC shows again, replace the HECU and recheck.

DTC C2112 VALVE RELAY ERROR**DESCRIPTION** E4ED910E

The HECU makes the valve relay OFF, when the ignition switch is turned ON, but ON during its initial check.

The HECU checks the valve relay by checking the voltage of the valve power monitoring wire and comparing the signals from the valve relay. The HECU also checks continuity of the valve power monitoring wire.

DTC DESCRIPTION E98D49AB

This code shows in case that there is no continuity of the valve power monitoring wire.

DTC DETECTING CONDITION E14DC7A9

DTC No	Condition	Possible Cause
C2112	<ul style="list-style-type: none"> - If the valve relay is switched on and the reference voltage of valve relay, less than $5\pm 0.5V$ continuously for 56ms, the failure is detected. - If the valve relay is switched off and the reference voltage of valve relay, more than $6\pm 0.5V$ continuously for 56ms, the failure is detected. - If the valve relay is switched off and all solenoid drivers are switched off and reference voltage of valve relay, less than $2.5\pm 0.5V$ continuously for 56ms, the failure is detected. 	<ul style="list-style-type: none"> - Open/short in the valve relay circuit - Faulty HECU

FAILSAFE FUNCTION

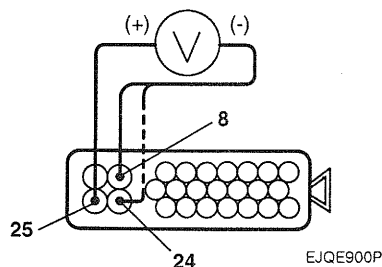
The system stops. the ABS, TCS(ESP) and the EBD functions are inhibited. The ABS, TCS(ESP) and the EBD warning lamps are ON. The valve relay and all solenoids are OFF.

INSPECTION PROCEDURE EFB92415

1. CHECK POWER SOURCE OF MOTOR.

- 1) Disconnect the connector from the HECU.
- 2) Measure the voltage between the terminals 9(+) and 8(-), 24(-) of the HECU connector.

Specification: Battery positive(+)



Is the voltage within the specification?

Is the voltage within the specification?

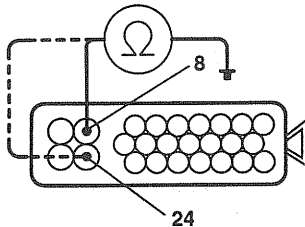
NO

- 1) Check ABS fuse (10A) and fusible link (30A).
- 2) Check and repair harness or connector.

YES

- ▶ Check circuit for continuity to ground.

2. CHECK CIRCUIT FOR CONTINUITY TO GROUND.



EJQE900J

- 1) Disconnect the connector from the HECU.
- 2) Measure the resistance between terminals 8(-), 24(-) of the HECU connector and the body ground.

Is the resistance below 1Ω ?

NO

- ▶ Check and readjust the installing of the body ground.

YES

- ▶ Test motor actuation by using hi-scan (pro)

3. TEST MOTOR ACTUATION BY USING HI-SCAN (PRO).

Is the sound of motor operating heard?

YES

- ▶ Check repair, if necessary, harness and connector.

NO

- ▶ Replace the HECU then recheck.

DTC C2380 ABS/TCS/ESP VALVE ERROR**DESCRIPTION** EEF1A4FA

The HECU monitors the solenoid valve operating circuit. If there is no continuity of the solenoid valve, when the HECU switches the solenoid valve ON, it is a cause an open or short in the circuit of the solenoid coil or harness.

DTC DESCRIPTION E1B43BFA

This code shows in case that there is an open or short in the circuit of the solenoid coil or harness.

DTC DETECTING CONDITION E6C58F04

DTC No	Condition	Possible Cause
C2380	<ul style="list-style-type: none"> - If the valve relay is switched ON and corresponding solenoid driver OFF and the voltage of solenoid, less than $3.5\pm 0.5V$ continuously for 56ms, the failure is detected. - If the valve relay is switched ON and corresponding solenoid driver ON and the voltage of solenoid, more than $1.5\pm 0.5V$ continuously for 56ms, the failure is detected. 	<ul style="list-style-type: none"> - Open/short in the solenoid valve circuit. - Faulty HECU

FAILSAFE FUNCTION

The system stops. the ABS, TCS(ESP) and the EBD functions are inhibited. The ABS, TCS(ESP) and the EBD warning lamps are ON. The valve relay and all solenoids are OFF.

INSPECTION PROCEDURE EB8B5E1D

1. CHECK THE DTC
 - 1) Clear the DTC using the Hi-Scan(pro).
 - 2) Turn the ignition wswitch OFF.
 - 3) Turn the ignition switch ON, and check if the same DTC is stored in the memory.

Is the same DTC output?

NO

- ▶ Problem is intermittent and the HECU memory was not cleared.

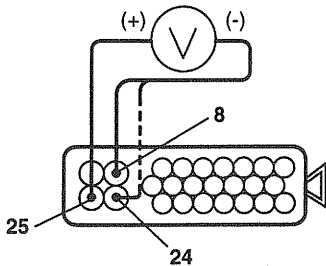
YES

- ▶ Check power source of valve relay

2. CHECK POWER SOURCE OF VALVE RELAY

- 1) Disconnect the connector from the HECU.
- 2) Measure the voltage between the terminals 25 and 8, 24 of the HECU connector.

Specification: Battery positive(B+)



EJQE900P

Is the voltage within the specification?

NO

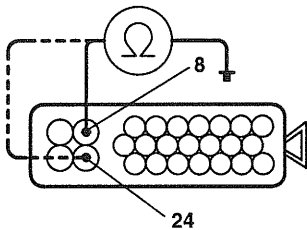
- 3) Check and replace fuse (10A) and fusible link (30A).
- 4) Check and repair harness or connector.

YES

▶ Check circuit for continuity to ground.

3. CHECK CIRCUIT FOR CONTINUITY TO GROUND.

- 1) Disconnect the connector from the HECU.
- 2) Measure the resistance between terminals 8(-), 24(-) of the HECU connector and the body ground.



EJQE900J

Is the resistance below 1Ω?

NO

▶ Check and readjust the installing of the body ground.

YES

▶ Replace the HECU then recheck.

DTC C2402 MOTOR-ELECTRICAL**DESCRIPTION** EE2899DB

When the ABS system operates, the HECU turns the ABS motor relay ON so that operates the ABS pump motor

DTC DESCRIPTION E3266E63

This code shows in case that there is no signal to the motor monitoring wire or an error on the motor power.

 **CAUTION**

Keep a vehicle idling because the compulsive operating of the motor shall cause the discharge of the battery, when testing the actuator.

DTC DETECTING CONDITION EA9A5CEF

DTC No	Condition	Possible Cause
C2402	<ul style="list-style-type: none"> - If the motor relay is switched ON and motor voltage is 4V less than IGN voltage continued for 56ms, the failure is detected. - After 1.8sec from motor relay is switched OFF, the motor voltage is more than 4V continued for 1.8sec, the failure is detected. - After motor relay is switched OFF, motor voltage is measured. If the time which motor voltage less than 1V is less than evaluation time, the motor is reactivated for 500msec and the above check is performed again for a maximum of two times. When the motor voltage is not normal even on the second recheck, the controller recognizes it as failure. If the motor relay is switched OFF and motor power supply voltage < 4V continued for 200ms, the failure is detected. 	<ul style="list-style-type: none"> - Open/short in motor regal or motor circuit. - Motor lock - Faulty HECU

FAILSAFE FUNCTION

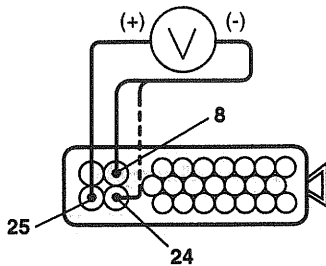
1. Motor error without the ABS control : only the ABS, TCS(ESP) functions are inhibited. The ABS,TCS(ESP) warning lamps are ON, but the EBD warning lamp OFF.
2. Motor error with the ABS control : inhibit the ABS control of front wheels, allow ABS control of the rear wheels. After the ABS control has completed, the ABS,TCS(ESP) warning lamps are ON.

INSPECTION PROCEDURE E42C81EF

1. CHECK POWER SOURCE OF MOTOR.

- 1) Disconnect the connector from the HECU.
- 2) Measure the voltage between the terminals 9(+), 8(-), 24(-) of the HECU connector.

Specification: Battery positive(+)



EJQE900P

Is the voltage within the specification?

NO

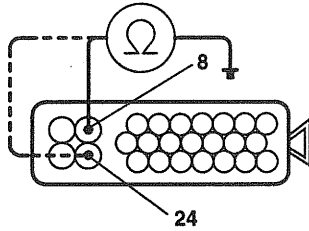
- 3) Check ABS fuse (10A) and fusible link (30A).
- 4) Check and repair harness or connector.

YES

- ▶ Check circuit for continuity to ground.

2. CHECK CIRCUIT FOR CONTINUITY TO GROUND.

- 1) Disconnect the connector from the HECU.
- 2) Measure the resistance between terminals 8(-), 24(-) of the HECU connector and the body ground.



EJQE900J

Is the resistance below 1Ω?

NO

- ▶ Check and readjust the installing of the body ground.

YES

- ▶ Test motor actuation by using hi-scan (pro)

3. TEST MOTOR ACTUATION BY USING HI-SCAN (PRO).

Is the sound of motor operating heard?

YES

- ▶ Check repair, if necessary, harness and connector.

NO

- ▶ Replace the HECU then recheck.

DTC C1274 G SENSOR-ELECTRICAL**DTC DETECTING CONDITION** EA92128E

DTC No	Condition	Possible Cause
C1274	When the voltage of Gsensor signal is more than 4.5V or less than 0.6V for 250msec continuously.	<ul style="list-style-type: none"> - Open/short in G-sensor circuit. - Faulty G-sensor - Faulty installing of G-sensor - Faulty HECU

FAILSAFE FUNCTION

Only the ABS, TCS(ESP) functions are inhibited. The ABS, TCS(ESP) warning lamps are ON, but the EBD warning lamp OFF.

INSPECTION PROCEDURE EEFA8F98

1. CHECK SHORT IN CIRCUIT TO BATTERY(+).

- 1) Disconnect the connector from the HECU.
- 2) Turn the ignition switch ON.
- 3) Measure the voltage between terminal 13 of the HECU connector and the body ground.

Is the voltage above 4.5V?

YES

- ▶ Repair short in the circuit to battery(+) between the G-sensor and the HECU.

NO

- ▶ Check short in circuit to ground.

2. CHECK SHORT IN CIRCUIT TO GROUND.

- 1) Disconnect the connector from the HECU.
- 2) Measure the resistance between terminal 13 of the HECU connector and the body ground.

Is the resistance below 1Ω?

YES

- ▶ Repair short in the circuit to the body ground between the G-sensor and the HECU.

NO

- ▶ Check output in HECU connector

3. CHECK OUTPUT IN HECU CONNECTOR.

- 1) Disconnect the connector from the HECU and turn the ignition switch ON.
- 2) Measure the voltage between terminals 13(+) and 15(-) of the HECU connector.

Is the voltage within 0.6V ~ 4.5V?

YES

- ▶ Check the HECU harness or connector.

NO

- ▶ If necessary, replace the HECU then recheck.

4. CHECK OUTPUT IN G-SENSOR CONNECTOR.

- 1) Turn the ignition switch ON.
- 2) Measure the voltage between terminals 2(+) and 3(-) of the G-sensor connector.

Specification: approximately 3.5V

Is the voltage within the specification?

NO

- ▶ Replace the G-sensor.

YES

- ▶ Replace the HECU then recheck.