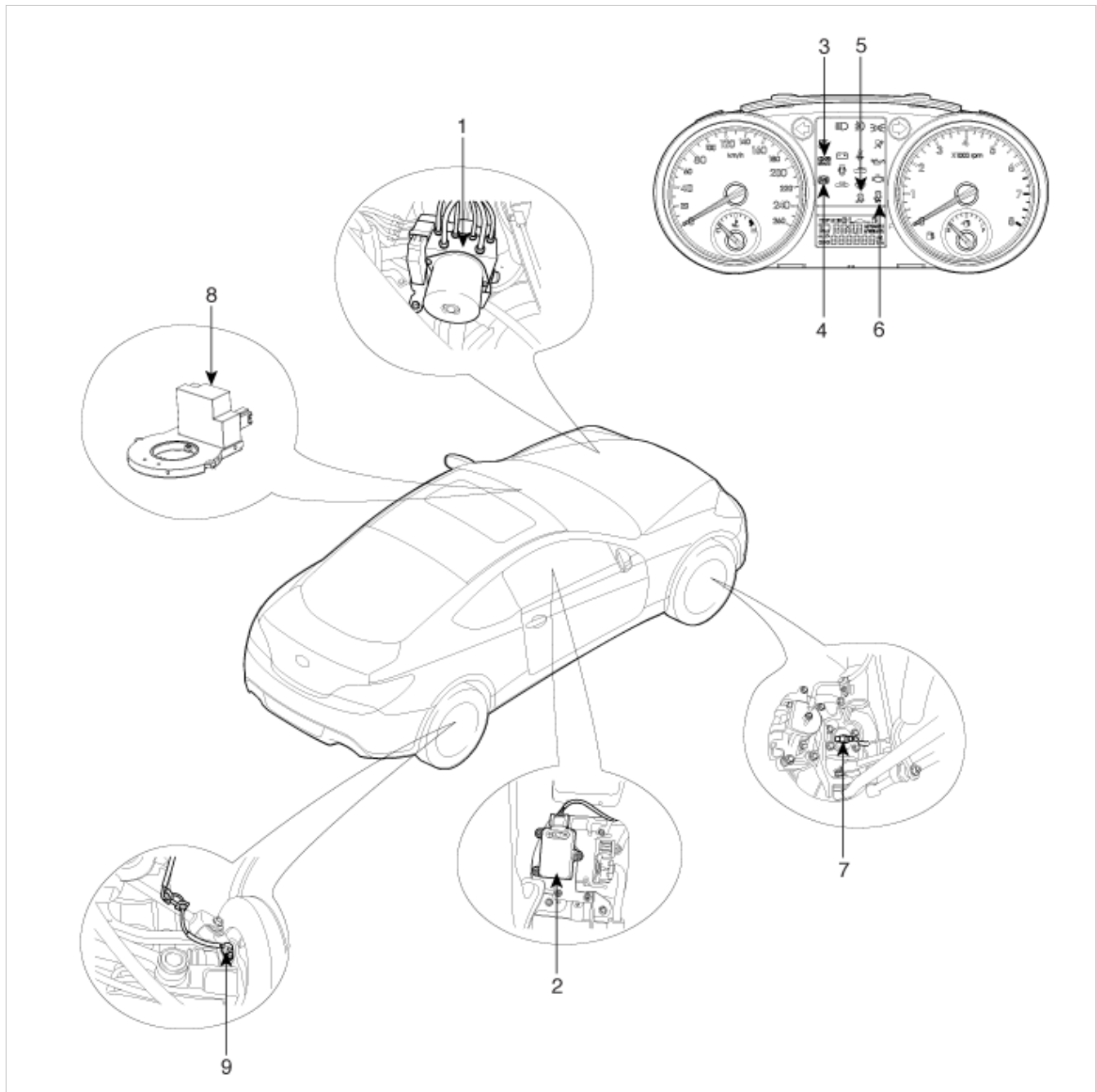


Components



1. HECU module
2. Yaw rate & Lateral G sensor
3. Parking brake/EBD warning lamp
4. ABS warning lamp
5. ESC function / warning lamp

6. ESC OFF warning lamp
7. Front wheel speed sensor
8. Steering angle sensor
9. Rear wheel speed sensor

Description of ESC

Optimum driving safety now has a name : ESC, the Electronic Stability Control.

ESC recognizes critical driving conditions, such as panic reactions in dangerous situations, and stabilizes the vehicle by wheel-individual braking and engine control intervention.

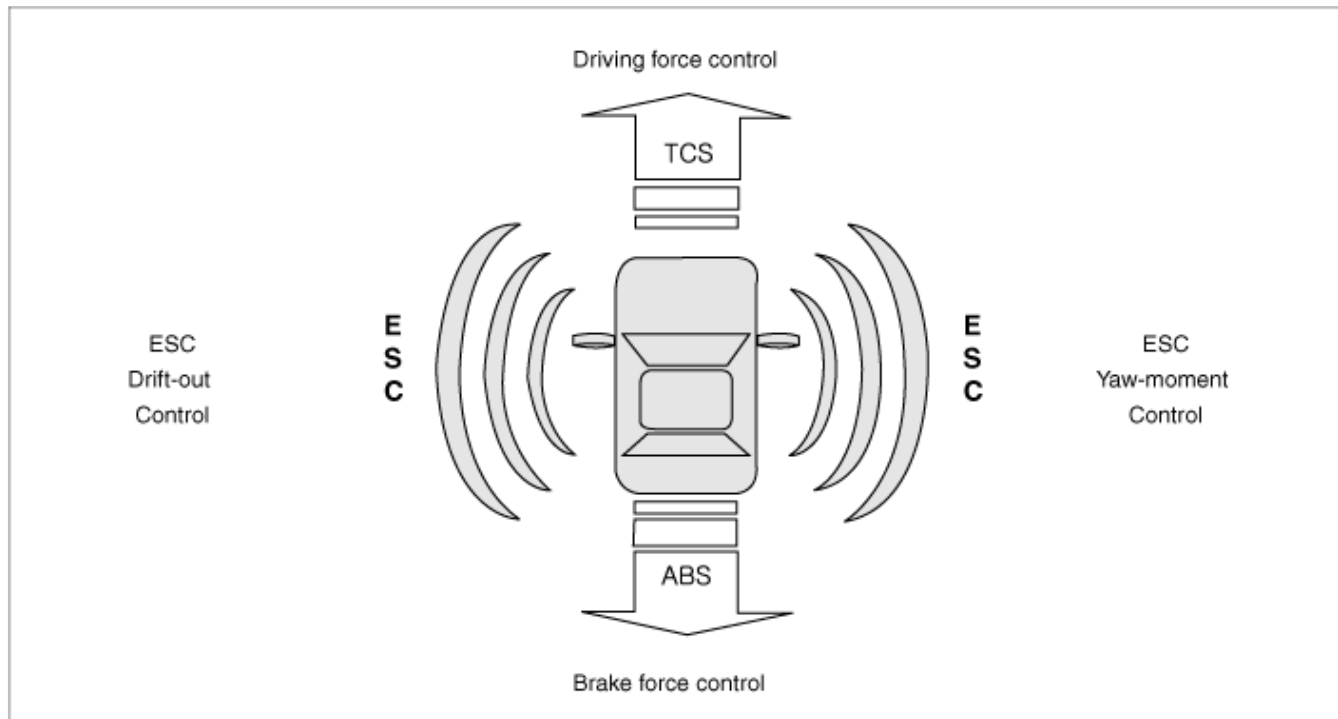
ESC adds a further function known as Active Yaw Control (AYC) to the ABS, TCS, EBD and EDC functions. Whereas the ABS/TCS function controls wheel slip during braking and acceleration and, thus, mainly intervenes in the longitudinal dynamics of the vehicle, active yaw control stabilizes the vehicle about its vertical axis.

This is achieved by wheel individual brake intervention and adaptation of the momentary engine torque with no need for any action to be taken by the driver.

ESC essentially consists of three assemblies : the sensors, the electronic control unit and the actuators.

The stability control feature works under all driving and operating conditions. Under certain driving conditions, the ABS/TCS function can be activated simultaneously with the ESC function in response to a command by the driver.

In the event of a failure of the stability control function, the basic safety function, ABS, is still maintained.



Description of ESC control

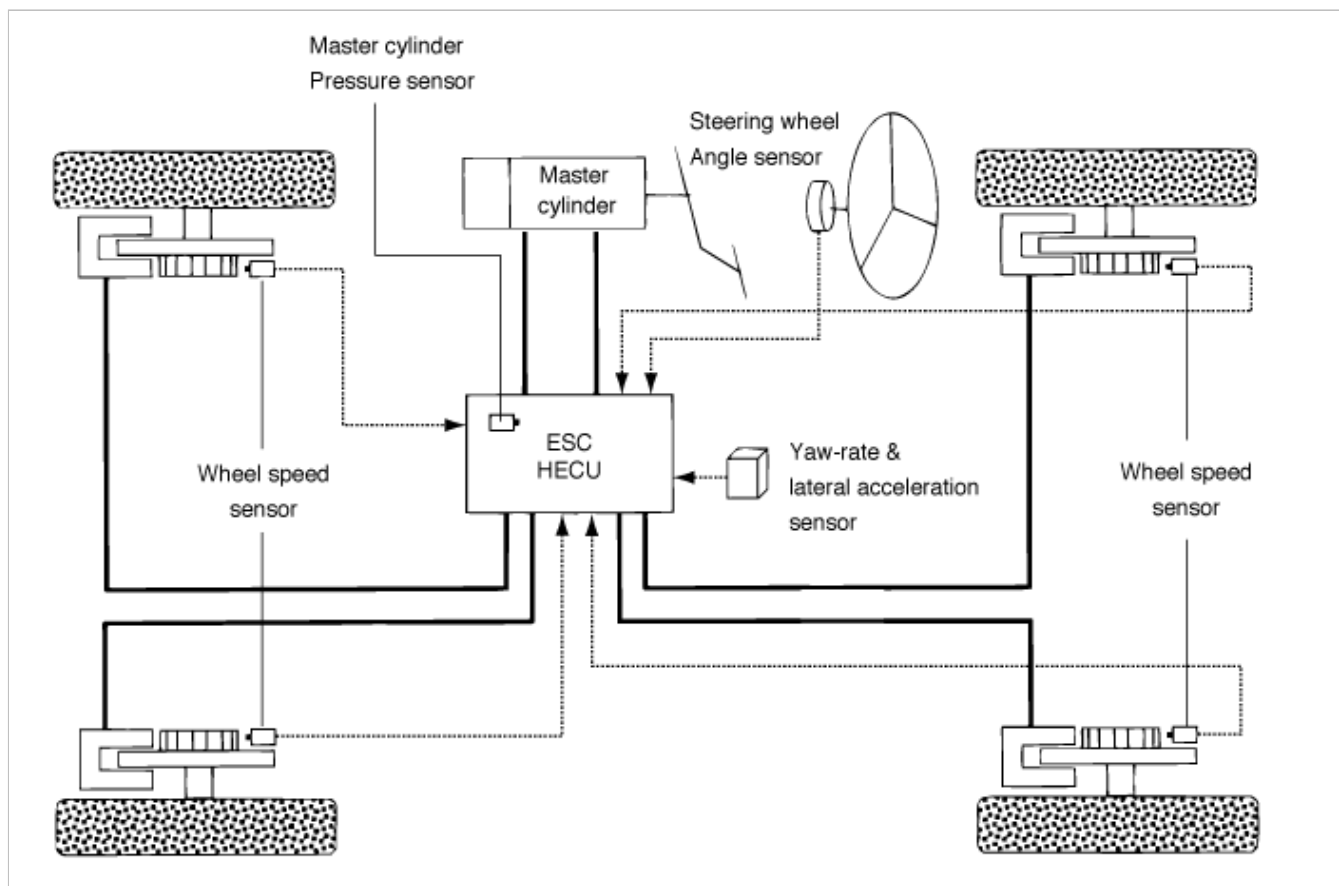
ESC system includes ABS/EBD, TCS and AYC function.

ABS/EBD function : The ECU changes the active sensor signal (current shift) coming from the four wheel sensors to the square wave. By using the input of above signals, the ECU calculates the vehicle speed and the acceleration & deceleration of the four wheels. And, the ECU judges whether the ABS/EBD should be actuated or not.

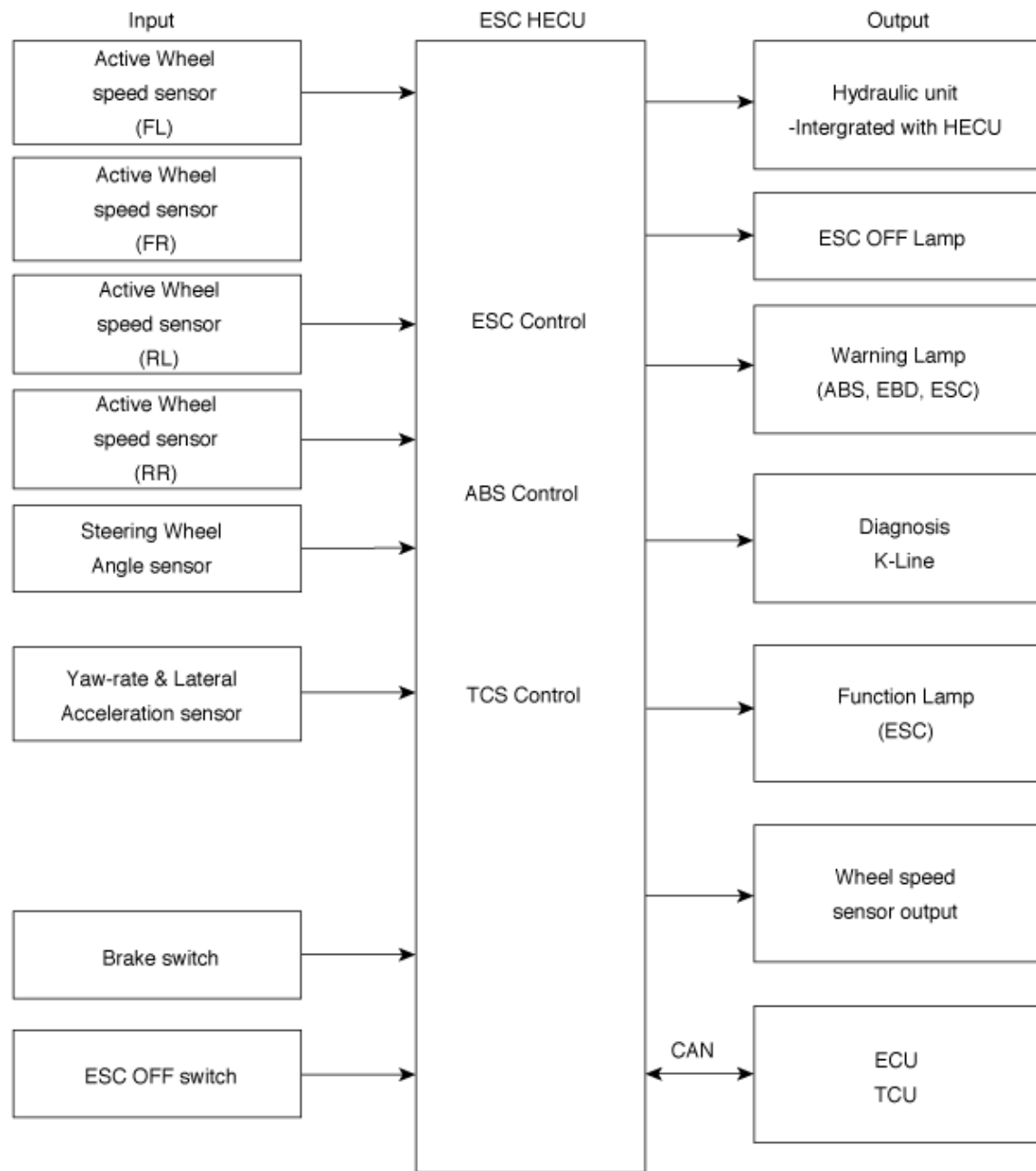
TCS function prevents the wheel slip of drive direction by adding the brake pressure and engine torque reduction via CAN communication. TCS function uses the wheel speed sensor signal to determine the wheel slip as far as ABS function.

AYC function prevents unstable maneuver of the vehicle. To determine the vehicle maneuver, AYC function uses the maneuver sensor signals (Yaw Rate Sensor, Lateral Acceleration Sensor, Steering Wheel Angle Sensor). If vehicle maneuver is unstable (Over Steer or Under Steer), AYC function applies the brake pressure on certain wheel, and send engine torque reduction signal by CAN.

After the key-on, the ECU continually diagnoses the system failure. (self-diagnosis) If the system failure is detected, the ECU informs driver of the system failure through the BRAKE/ABS/ESC warning lamp. (fail-safe warning)

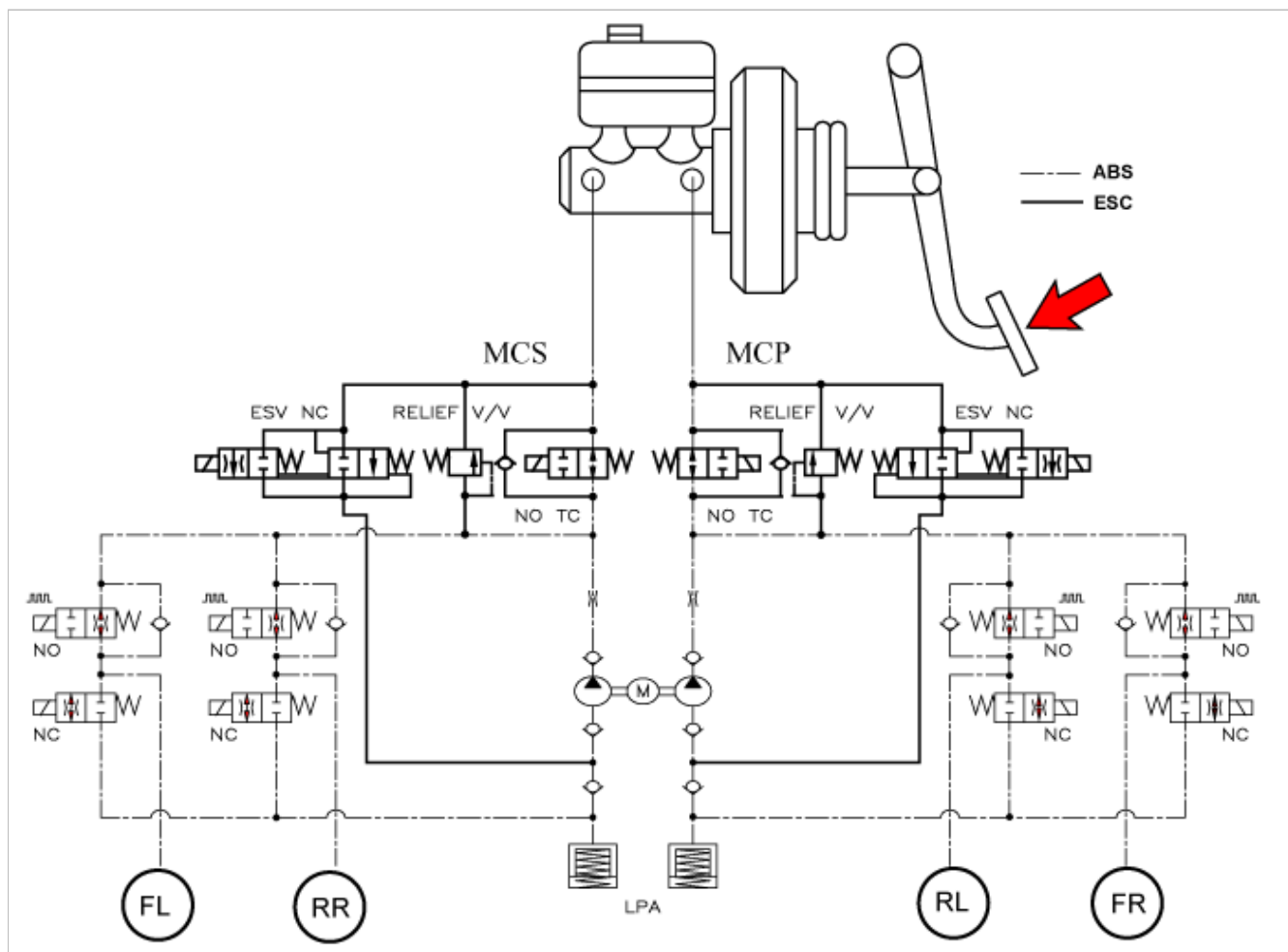


Input and output diagram



ESC Operation mode

ESC Hydraulic system diagram

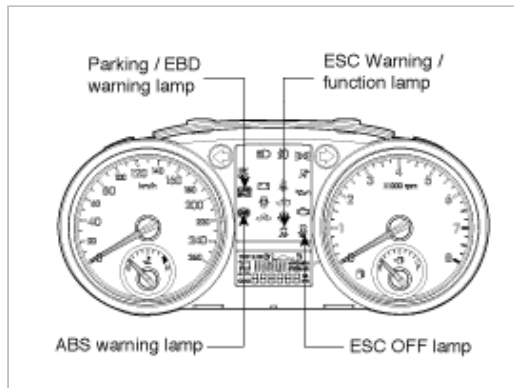


1. ESC Non-operation : Normal braking.

Solenoid valve	Continuity	Valve	Motor pump	TC Valve
IN (NO)	OFF	OPEN	OFF	OFF
OUT (NC)	OFF	CLOSE		

2. ESC operation

Solenoid valve		Continuity	Valve	Motor pump	TC Valve
Understeering (Only inside of rear wheel)	IN(NO)	OFF	OPEN	ON	ON
	OUT(NC)	OFF	CLOSE		
Oversteering (Only outside of front wheel)	IN(NO)	OFF	OPEN		
	OUT(NC)	OFF	CLOSE		



ABS Warning lamp module

The active ABS warning lamp module indicates the self-test and failure status of the ABS. The ABS warning lamp shall be on:

- During the initialization phase after IGN ON. (continuously 3 seconds).
- In the event of inhibition of ABS functions by failure.
- During diagnostic mode.
- When the ECU Connector is separated from ECU.

EBD/Parking brake warning lamp module

The active EBD warning lamp module indicates the self-test and failure status of the EBD. However, in case the Parking Brake Switch is turned on, the EBD warning lamp is always turned on regardless of EBD functions. The EBD warning lamp shall be on:

- During the initialization phase after IGN ON. (continuously 3 seconds).
- When the Parking Brake Switch is ON or brake fluid level is low.
- When the EBD function is out of order .
- During diagnostic mode.
- When the ECU Connector is separated from ECU.

ESC Warning lamp (ESC system)

The ESC warning lamp indicates the self-test and failure status of the ESC.

The ESC warning lamp is turned on under the following conditions :

- During the initialization phase after IGN ON. (continuously 3 seconds).
- In the event of inhibition of ESC functions by failure.
- When driver turn off the ESC function by on/off switch.
- During diagnostic mode.

ESC Function lamp (ESC system)

The ESC function lamp indicates the self-test and operating status of the ESC.

The ESC Function lamp operates under the following conditions :

- During the initialization phase after IGN ON. (continuously 3 seconds).
- When the ESC control is operating. (Blinking - 2Hz)

ESC On/Off switch (ESC system)

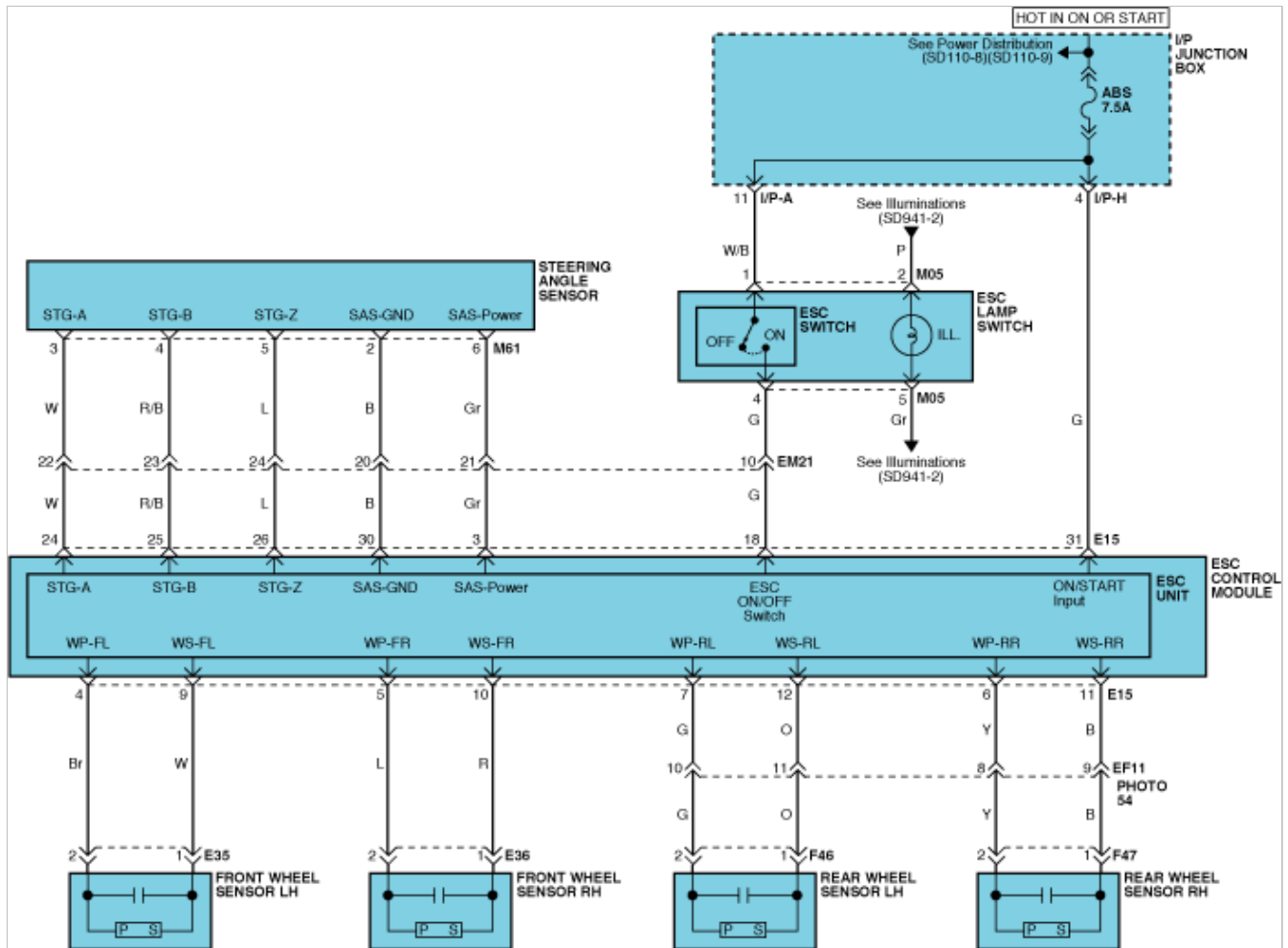
The ESC On/Off Switch shall be used to toggle the ESC function between On/Off states based upon driver input.

The On/Off switch shall be a normally open, momentary contact switch. Closed contacts switch the circuit to ignition.

Initial status of the ESC function is on and switch toggle the state.

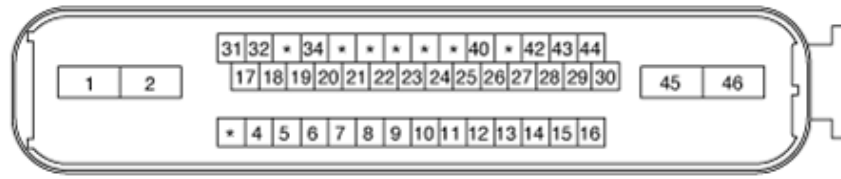
GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > Schematic Diagrams

Circuit Diagram - ESC(1)



Circuit Diagram - ESC(2)

ESC Connector Input/Output



Connector Terminal		Specification	Remark
No	Description		
31	IGNITION1(+)	Over voltage range : $17 \pm 0.5V$ Operating voltage range : $9.5 \pm 0.5V < V < 17 \pm 0.5V$ Low voltage range : $7.0 \pm 0.5V < V < 9.5 \pm 0.5V$ Max. current : $I < 500mA$	
1	POS.BATTERY.(SOLENOID)	Max leakage current : $I < 0.8mA$ Operating voltage range : $9.5 \pm 0.5V < V < 17 \pm 0.5V$ Max. current : $I < 40A$ Hardware shutdown voltage : $V < 6.0V$	
2	POS.BATTERY.(MOTOR)	Operating voltage range: $9.5 \pm 0.5V < V < 16.5 \pm 0.5V$ Rush current : $I < 100A$ Max current : $I < 40A$ Max leakage current : $I < 0.2mA$	
46	GROUND	Rated current : $I < 500mA$ Max. current: $I < 40A$	
45	PUMP MOTOR GROUND	Rush current : $I < 100A$ Max current : $I < 40A$	
16	YAW & LATERAL G SENSOR GROUND	Rated current : $I < 150mA$	
17	YAW SENSOR POWER	Max Output current : $I < 150mA$ Max Output voltage : $V(IGN) \pm 1V$	
34	BRAKE LIGHT SWITCH	Input voltage (Low) : $0V \leq V \leq 3.0V$ Input voltage (High) : $7.0V \leq V \leq 16.0V$	
32	BRAKE SWITCH		
8	PARKING BRAKE SWITCH	Input voltage (Low) : $0V \leq V_{Low} \leq 3.0V$ Input voltage (High) : $7.0V \leq V_{High} \leq 16.0V$ Max input current : $I < 10mA$	
27	SENSOR FRONT RIGHT OUTPUT	Max current : $I < 16mA$ External pull up resistance : $1 K\Omega < R$ Output duty : $50 \pm 20\%$	
41	SENSOR REAR RIGHT OUTPUT		
18	ESC ON/OFF SWITCH	Input voltage (Low) : $0V \leq V \leq 3.0V$ Input voltage (High) : $7.0V \leq V \leq 16.0V$ Max input current : $I < 10mA$	
15	CAN BUS LINE(LOW)		
14	CAN BUS LINE(HIGH)		
4	SENSOR FRONT LEFT POWER		

5	SENSOR FRONT RIGHT POWER	Output voltage : IGN (V) \pm 1V Output current : Max 30mA	
7	SENSOR REAR LEFT POWER		
6	SENSOR REAR RIGHT POWER		
9	SENSOR FRONT LEFT SIGNAL	Input current LOW : 5.9 ~ 8.4mA Input current HIGH : 11.8 ~ 16.8mA Frequency range : 1 ~ 2500Hz Input duty : 50 \pm 20%	
10	SENSOR FRONT RIGHT SIGNAL		
12	SENSOR REAR LEFT SIGNAL		
11	SENSOR REAR RIGHT SIGNAL		
30	STEERING ANGLE SENSOR (GROUND)	Rated current : I < 100mA	
3	STEERING ANGLE SENSOR (POWER)	Max output current : I < 100mA Max output voltage : 4.75V \leq V \leq 5.25V	
24	STEERING ANGLE SENSOR (PHASE 1)	Input duty (ST1, ST2) : 50 \pm 10% Phase difference (ST1, ST2) : 2 \pm 0.6deg High voltage : 3.0V < V < 4.1V Low voltage : 1.3V < V < 2.0V	
25	STEERING ANGLE SENSOR (PHASE 2)		
26	STEERING ANGLE SENSOR (PHASE N)		
42	SENSOR CAN BUS LINE (High)		
43	SENSOR CAN BUS LINE (Low)		
33	VACUUM SWITCH	Input voltage low : 0V \leq V \leq 3.0V Input voltage High : 7.0V \leq V \leq 16.0V Max input current : I < 10mA	
40	VACUUM PUMP RELAY DRIVE	Max. current : I < 200mA Max. output low voltage : V < 0.5V	

GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control) System > Troubleshooting

Failure Diagnosis

1. In principle, ESC and TCS controls are prohibited in case of ABS failure.
2. When ESC or TCS fails, only the failed system control is prohibited.
3. However, when the solenoid valve relay should be turned off in case of ESC failure, refer to the ABS fail-safe.
4. Information on ABS fail-safe is identical to the fail-safe in systems where ESC is not installed.

Memory of Fail Code

1. It keeps the code as far as the backup lamp power is connected. (O)
2. It keeps the code as far as the HCU power is on. (X)

Failure Checkup

1. Initial checkup is performed immediately after the HECU power on.
2. Valve relay checkup is performed immediately after the IG2 ON.
3. It executes the checkup all the time while the IG2 power is on.

Countermeasures In Fail

1. Turn the system down and perform the following actions and wait for HECU power OFF.
2. Turn the valve relay off.
3. Stop the control during the operation and do not execute any until the normal condition recovers.

Warning Lamp ON

1. ESC operation lamp turn on for 3sec after IGN ON.
2. ESC operation lamp blinks when ESC Act.
3. ESC OFF lamp turn on in case of
 - A. ESC Switch OFF
 - B. ESC Failure Detect
 - C. 3sec after IGN ON

ESC Diagnostic Trouble Code(DTC) chart

● : MIL ON ○ : MIL OFF

DTC CODE	Trouble description	Warning lamp condition			Remark
		EBD	ABS	ESC	
C1101	Battery Voltage High	●	●	●	
C1102	Battery Voltage Low	○/●	●	●	
C1112	Sensor Source voltage	○	○	●	ESC only
C1200	Wheel Speed Sensor Front-LH Open/Short	○/●	●	●	
C1201	Wheel Speed Sensor Front-LH Range / Performance / Intermittent	○/●	●	●	
C1202	Wheel Speed Sensor Front-LH Invalid/no Signal	○/●	●	●	
C1203	Wheel Speed Sensor Front-RH Open/Short	○/●	●	●	
C1204	Wheel Speed Sensor Front-RH Range / Performance / Intermittent	○/●	●	●	
C1205	Wheel Speed Sensor Front-RH Invalid/no Signal	○/●	●	●	

C1206	Wheel Speed Sensor Rear-LH Open/Short	○/●	●	●	
C1207	Wheel Speed Sensor Rear-LH Range / Performance / Intermittent	○/●	●	●	
C1208	Wheel Speed Sensor Rear-LH Invalid/no Signal	○/●	●	●	
C1209	Wheel Speed Sensor Rear-RH Open/Short	○/●	●	●	
C1210	Wheel Speed Sensor Rear-RH Range / Performance / Intermittent	○/●	●	●	
C1211	Wheel Speed Sensor Rear-RH Invalid/no Signal	○/●	●	●	
C1235	Primary Pressure Sensor-Electrical	○	○	●	ESC only
C1237	Primary Pressure Sensor-Signal	○	○	●	ESC only
C1259	Steering Angle Sensor – Electrical Malfunction	○	○	●	ESC only
C1260	Steering Angle Sensor Circuit-Signal	○	○	●	ESC only
C1282	Yaw Rate & Lateral G Sensor-Electrical	○	○	●	ESC only
C1283	Yaw Rate & Lateral G Sensor-Signal	○	○	●	ESC only
C1503	TCS/ESC Switch error	○	○	○	ESC only
C1513	Brake switch error	○	○	●	ESC only
C1604	ECU Hardware Error	●	●	●	
C1605	CAN Hardware error	○	○	●	ESC only
C1611	CAN Time-out ECM	○	○	●	ESC only
C1612	CAN Time-out TCM	○	○	●	ESC only
C1613	CAN Wrong Message	○	○	●	ESC only
C1616	CAN Bus off	○	○	●	ESC only
C1647	CAN Hardware Error - Sensor Channel	○	○	●	ESC only
C2112	Valve Relay Error	●	●	●	
C2126	Vacuum Pump Relay Drive Pin Open/Short	○	○	●	ESC only
C2227	Excessive Temperature Of Brake Disc	○	○	●	ESC only
C2231	Vacuum Pump System Fail	○	○	●	ESC only
C2380	ABS/TCS/ESC valve error	●	●	●	
C2402	Motor Failure	○	●	●	

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1101 Battery Voltage High**

General Description

The ABS ECU(Electronic Control Unit) checks the battery voltage and alternator output voltage to determine, as a safety issue, whether the ABS system can operate normally or not.

The normal battery voltage range is essential for controlling the ABS system as intended.

DTC Description

The ABS ECU monitors battery voltage and alternator output voltage.

When the voltage is higher than the expected normal value, this code is set, and the ABS/EBD/ESC functions are prohibited.

If the voltage recovers, to within normal operating ranges, then the controller returns to normal operation as well.

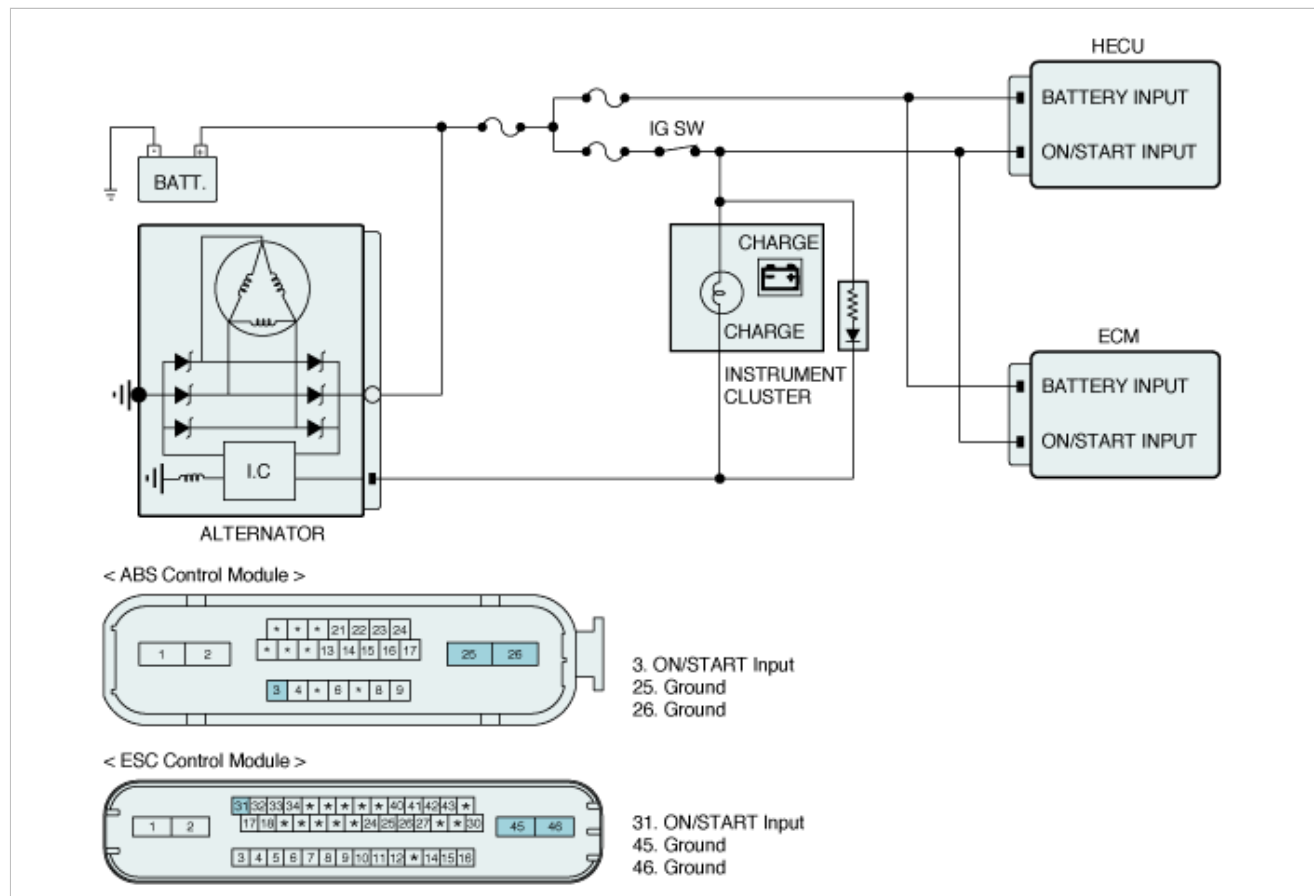
DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	• Battery Voltage Monitoring	<ul style="list-style-type: none"> • Poor connection in power supply circuit (IGN+) • Faulty Alternator • Faulty HECU
Enable Conditions	<ul style="list-style-type: none"> • When $V_{ign} > 17V \pm 0.5V$ is continued for 500msec. - If the voltage recovers to normal operating range, the controller returns to normal state. 	
Fail Safe	<ul style="list-style-type: none"> • The ABS/EBD/ESC functions are inhibited. • The ABS/EBD/ESC warning lamps are activated. 	

Specification

Normal Voltage Range	ENG "ON"
	10V ~ 16V

Diagnostic Circuit Diagram



Monitor Scantool Data

1. Connect scantool to Data Link Connector(DLC)
2. Ignition "ON" & Engine "ON".
3. Monitor the "BATTERY VOLTAGE" parameter on the scantool.

Specification : Below. 17.5V

Sensor Name	Value	Ref. Min	Ref. Max	Unit	Test Condition
<input checked="" type="checkbox"/> Battery Positive Voltage	14.0			V	-

Fig.1

Fig 1) Test Condition : Ignition "ON" & Engine "ON".
Normal Data

4. Is parameter displayed within specifications?

YES	► Fault is intermittent caused by poor connection in power harness (IGN+) and/or HECU's connector or was repaired and HECU memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Terminal and Connector Inspection" procedure.

Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Verify presence of battery voltage codes in other ECUs (SRS, etc). If battery voltage codes are not present in other ECUs, go to "Power Circuit Inspection" procedure. If battery voltage codes are present in other ECUs, go to "Alternator Output Voltage Inspection" procedure.

Alternator Output Voltage Inspection

■ Charging System Check

1. Ignition "ON" & Engine "ON".
2. Maintain ENG RPM 2,500RPM over 2 minutes.
3. Measure voltage between the battery terminal(+) and the battery terminal(-).

Specification : Below. 17±0.5V

4. Is the measured value within specifications?

YES	► Go to "Power Circuit Inspection" procedure.
NO	► Check that the tension of drive belt, ENG RPM, fuse, terminal of battery, all terminals of alternator are in good condition and Check for damaged harness and poor connection between alternator and battery. If OK repair or replace alternator and then go to "Verification of vehicle Repair" procedure.

Power Circuit Inspection

■ Open or Short Check

1. Ignition "ON" & Engine "OFF".
2. Measure voltage between the battery terminal(+) and power terminal of the HECU harness connector.

Specification : Approx. below 0.2V

3. Is the measured value within specifications?

YES	► Go to "Ground Circuit Inspection" procedure.
NO	► Check for open or blown ABS fuse referring to "Circuit Diagram". Repair open or short in power circuit between battery and HECU harness connector and then go to "Verification of vehicle Repair" procedure.

Ground Circuit Inspection

■ Open or Short Check

1. Ignition "OFF" & Engine "OFF".
2. Disconnect HECU connector.
3. Measure resistance between ground terminal of the HECU harness connector and chassis ground.

Specification : Approx. below 1Ω

4. Is the measured value within specifications?

YES	► Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.
NO	► Repair open or short in ground circuit between HECU harness connector and chassis ground and then go to "Verification of vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information.
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1102 Battery Voltage Low**

General Description

The ABS ECU(Electronic Control Unit) checks the battery voltage and alternator output voltage to determine, as a safety issue, whether the ABS system can operate normally or not.

The normal battery voltage range is essential for controlling the ABS system as intended.

DTC Description

The ABS ECU monitors the battery voltage and alternator output voltage by reading the value of voltage.

When the voltage is lower than the expected normal value, this code is set.

The ABS/ESC functions are prohibited and the EBD function is allowed on LOW VOLTAGE CONDITION, the ABS/EBD/ESC functions are prohibited on UNDER VOLTAGE CONDITION.

If the voltage recovers, to within normal operating ranges, then the controller returns to normal operations as well.

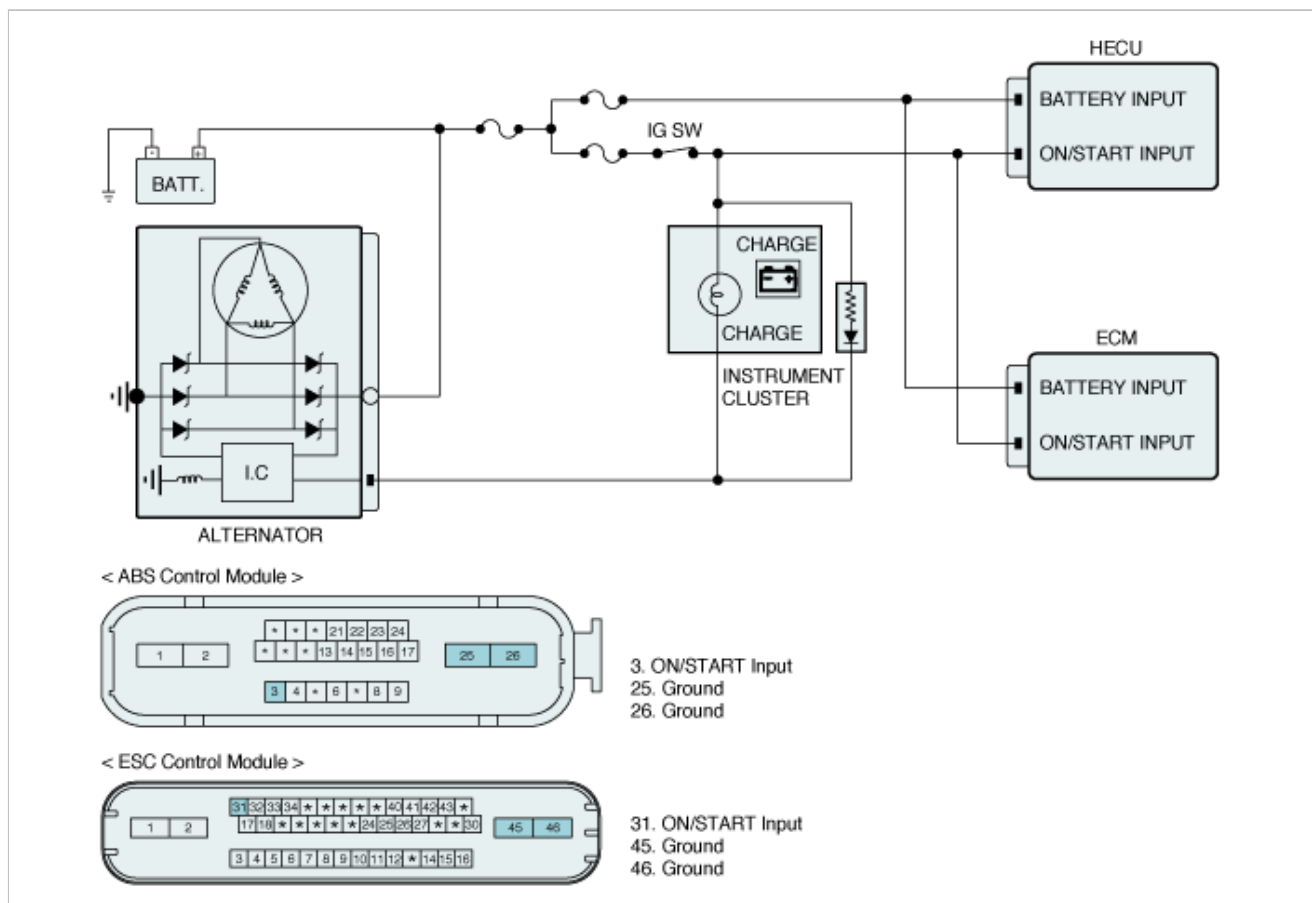
DTC Detecting Condition

Item		Detecting Condition	Possible cause
DTC Strategy		• Battery Voltage Monitoring	<ul style="list-style-type: none"> • Poor connection in power supply circuit (IGN+) • Faulty HECU • Discharge of electricity
Case1 (Low voltage)	Enable Conditions	<ul style="list-style-type: none"> • When $V_{ign} < 9.5V \pm 0.5V$ is continued for 500msec during $V_{ref} \geq 7Km/h$. • When $V_{ign} < 8.5V \pm 0.5V$ is continued for 500msec during $V_{ref} < 7Km/h$ or ABS/ESP(ESC) control. - If IGN voltage is recovered to normal operating voltage, the system recovers to normal state. 	
	Fail Safe	<ul style="list-style-type: none"> • Outside the ABS control cycle : Inhibit the ABS/ESC control, allow the EBD control , The ABS/ESC warning lamps are activated, When the voltage recovers the normal operating range, erase the error code. • Inside the ABS control cycle : Inhibit the ABS/ESC control. The ABS/ESC warning lamps are activated. Although the voltage recovers the normal operating range, warning lamps are illuminated and the error code is always stored. 	
Case2 (Under voltage)	Enable Conditions	<ul style="list-style-type: none"> • When $V_{ign} < 7.2V \pm 0.5V$ is continued for 56msec. - If IGN voltage is recovered to normal operating voltage, the system recovers to normal state. 	
	Fail Safe	<ul style="list-style-type: none"> • The ABS/EBD/ESC functions are inhibited. • The ABS/EBD/ESC warning lamps are activated. 	

Specification

Normal Voltage Range	ENG "ON"
	10V ~ 16V

Diagnostic Circuit Diagram



Monitor Scantool Data

1. Connect scantool to Data Link Connector(DLC)
2. Ignition "ON" & Engine "ON".
3. Monitor the "BATTERY VOLTAGE" parameter on the scantool.

Specification : Above. $9 \pm 0.5V$

Sensor Name	Value	Ref. Min	Ref. Max	Unit	Test Condition
<input checked="" type="checkbox"/> Battery Positive Voltage	14.0			V	-

Fig.1

Fig 1) Test Condition : Ignition "ON" & Engine "ON".
Normal Data

4. Is parameter displayed within specifications?

YES	<p>► Fault is intermittent caused by poor connection in power harness (IGN+) and/or HECU's connector or was repaired and HECU memory was not cleared.</p> <p>Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.</p> <p>Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.</p>
NO	<p>► Go to "Terminal and Connector Inspection" procedure.</p>

Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Alternator Output Voltage Inspection" procedure.

Alternator Output Voltage Inspection

■ Charging System Check

1. Ignition "ON" & Engine "ON".
2. Maintain ENG RPM 2,500RPM over 2 minutes.
3. Measure voltage between the battery terminal(+) and the battery terminal(-).

Specification : Above. $9 \pm 0.5V$

4. Is the measured value within specifications?

YES	► Go to "Power Circuit Inspection" procedure.
NO	► Check that the tension of drive belt, ENG RPM, fuse, terminal of battery, all terminals of alternator are in good condition and Check for damaged harness and poor connection between alternator and battery. If OK repair or replace alternator and then go to "Verification of vehicle Repair" procedure.

Power Circuit Inspection

■ Open or Short Check

1. Ignition "ON" & Engine "OFF".
2. Measure voltage between the battery terminal(+) and power terminal of the HECU harness connector.

Specification : Approx. below 0.2V

3. Is the measured value within specifications?

YES	► Go to "Ground Circuit Inspection" procedure.
NO	► Check for open or blown ABS fuse referring to "Circuit Diagram". Repair open or short in power circuit between battery and HECU harness connector and then go to "Verification of vehicle Repair" procedure.

Ground Circuit Inspection

■ Open or Short Check

1. Ignition "OFF" & Engine "OFF".
2. Disconnect HECU connector.
3. Measure resistance between ground terminal of the HECU harness connector and chassis ground.

Specification : Approx. below 1Ω

4. Is the measured value within specifications?

YES	► Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.
NO	► Repair open or short in ground circuit between HECU harness connector and chassis ground and then go to "Verification of vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information.
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1112 Sensor source voltage**

General Description

The HECU monitors supply voltage of each sensor for normal ESC control.

If supply voltage is out of specified range ABS/ESC warning lamps are turned on and ABS/ESC controls are inhibited.

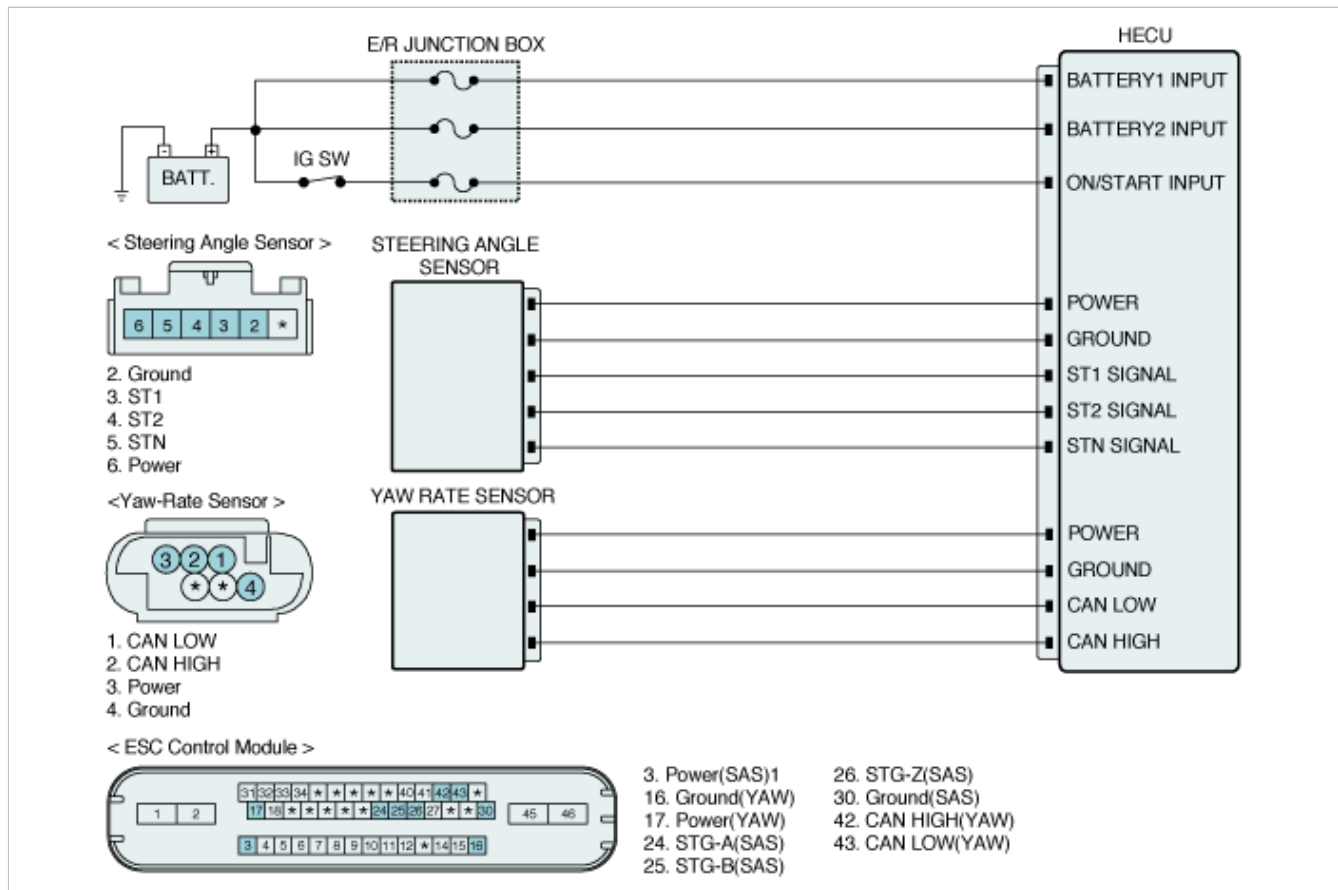
DTC Description

A failure is detected if the external sensor supply voltage is out of the specified range for more than the specified min. fault duration.

DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	• Battery Voltage Monitoring	<ul style="list-style-type: none"> • Faulty HECU • Poor connection in power supply circuit to sensor
Enable Conditions	<ul style="list-style-type: none"> • During sensor power ON, If the voltage of sensor power is out of the specified range for 500ms. • During sensor power OFF, If the voltage of sensor power is out of the specified range for 500ms. 	
Fail Safe	• ABS/ESC functions are inhibited, EBD function is allowed and the ABS/ESC warning lamps are activated.	

Diagnostic Circuit Diagram



Monitor Scantool Data

1. Connect scantool to Data Link Connector(DLC)
2. Ignition "ON" & Engine "ON".
3. Monitor the "BATTERY VOLTAGE" parameter on the scantool.

Specification :

BATTERY VOLTAGE (Approx. 10V ~ 16V)

4. Is parameter displayed within specifications?

YES	► Fault is intermittent caused by poor connection in HECU's connector or was repaired and HECU memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Terminal and Connector Inspection" procedure.

Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Power Circuit Inspection" procedure.

Power Circuit Inspection**■ Open or Short Check**

1. Ignition "ON" & Engine "OFF".
2. Measure voltage between power terminal of the steering angle sensor, Yaw rate & lateral G sensor harness connector and chassis ground.

Specification :

Approx. 12V (steering angle sensor, Yaw rate & lateral G sensor)

3. Is the measured value within specifications?

YES	► Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.
NO	► Repair open or short in power circuit between HECU harness connector and steering angle sensor, Yaw rate & lateral G sensor harness connector and then go to "Verification of vehicle Repair" procedure. If there is no problem in power circuit, Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information.
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

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YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1200 Wheel Speed Sensor Front-LH Open/Short**

General Description

The wheel speed sensor is the essential component the ABS ECU uses to calculate vehicle speed and to determine whether wheel lock occurs.

For example, rear wheel speed signal is used as a reference value, for vehicle speed, in front wheel drive vehicles, and if a difference between front and rear wheel speed occurs, then ABS control is performed.

Wheel speed sensor is active hall-sensor type.

DTC Description

The ABS ECU monitors the wheel speed sensor circuit continuously.

If the sensor signal current is continuously out of the specified range for 140msec, then the HECU determines that the circuit is open/short, and sets this code.

Warning lamp is turned OFF unless additional faults are detected when the IG KEY is turned ON again, and wheel speed is more than 10 Km/h (6.2mph).

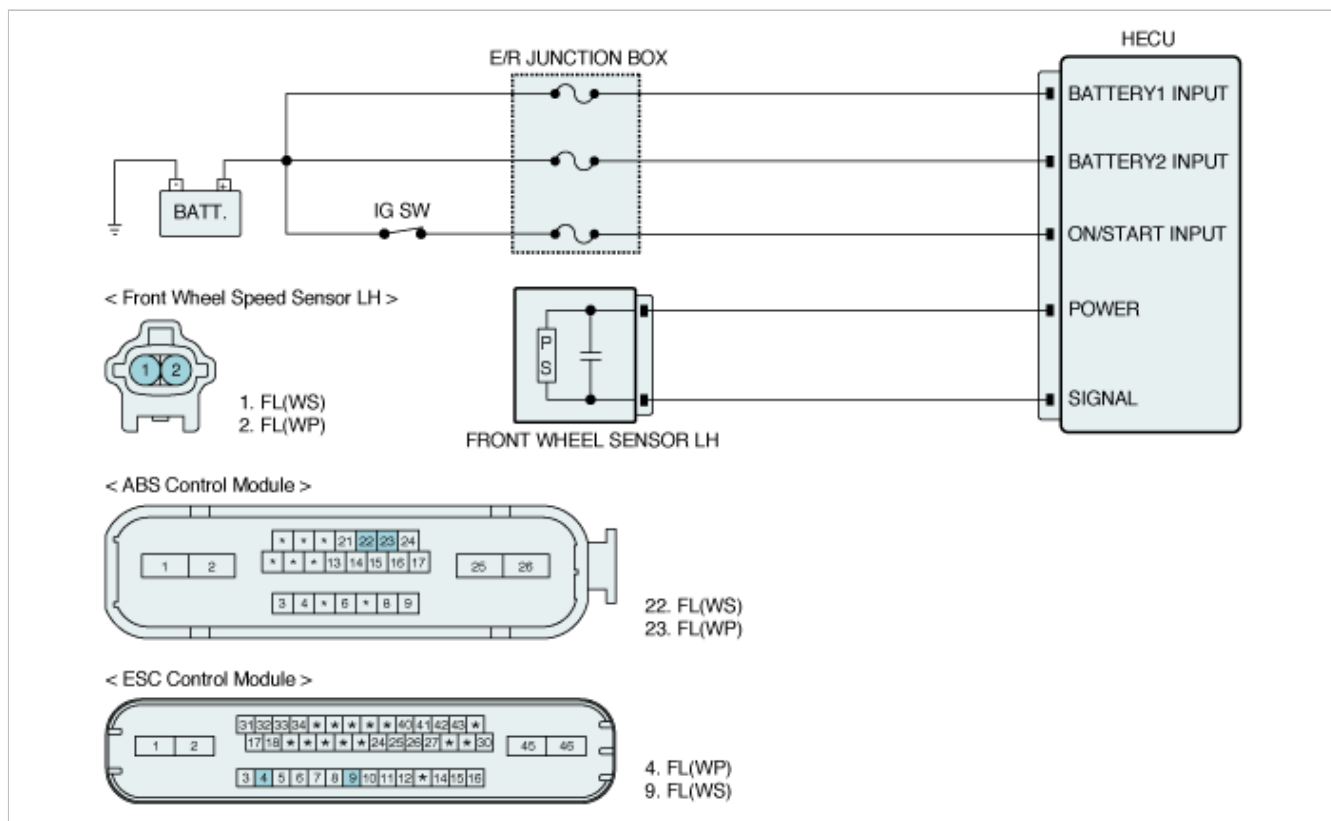
DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	• Current Monitoring	• Open or short of Wheel speed sensor circuit • Faulty Wheel speed sensor
Enable Conditions	• When the sensor signal current is continuously out of the specified range of $4\text{ mA} \pm 10\%$ ~ $22\text{ mA} \pm 10\%$ for 140msec.	
Fail Safe	1. Only one wheel failure : Inhibit the ABS/ESC control, allow the EBD control. The ABS/ESC warning lamps are activated, the EBD warning lamp is not activated. 2. More than two wheels failure : The ABS/EBD/ESC functions are inhibited. The ABS/EBD/ESC warning lamps are activated.	

Specification

Sensor Type	Output Voltage		Airgap
	HIGH	LOW	
Active Type	1.18~1.68V	0.59~0.84V	0.4~1.5mm

Diagnostic Circuit Diagram



Signal Waveform & Data

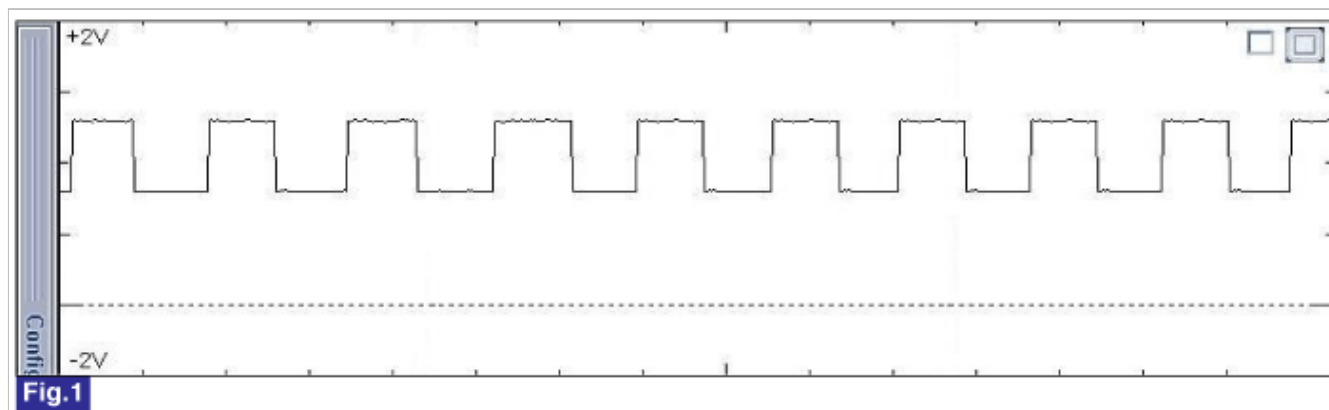


Fig 1) Normal waveform of wheel speed sensor (Active type)

- High : Approx. 1.4V, Low : Approx. 0.7V

Monitor Scantool Data

1. Ignition "ON" & Engine "ON".
2. Connect scantool to Data Link Connector(DLC)
3. Start and drive vehicle in gear and maintain vehicle speed at or above 10km/h. (6.2mph)
4. Monitor the "WHEEL SPEED(FL)" parameter on the Scantool.

Specification :

Compare with other parameters related to wheel speed sensor.
If it is the same as other parameters, it is in normal condition.

5. Is parameter displayed within specifications?

YES

► Fault is intermittent caused by poor connection in wheel speed sensor harness (FL) and/or HECU's connector or was repaired and HECU memory was not cleared.

	Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Terminal and Connector Inspection" procedure.

Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Power Circuit Inspection" procedure.

Power Circuit Inspection

■ Open or Short Check

1. Ignition "ON" & Engine "OFF".
2. Measure voltage between power terminal of the wheel speed sensor harness connector and chassis ground.

Specification : Approx. B+

3. Is the measured value within specifications?

YES	► Go to "Signal Circuit Inspection" procedure.
NO	► Repair open or short in power circuit between HECU harness connector and wheel speed sensor harness connector and then go to "Verification of vehicle Repair" procedure. If there is no problem in Power circuit, Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.

Signal Circuit Inspection

■ Wheel speed sensor circuit check

1. Lift the vehicle.
2. Ignition "ON" & Engine "OFF".
3. Turn the wheel by hand.
4. Measure waveform between wheel speed sensor signal terminal of the HECU harness connector and chassis ground with oscilloscope.

Specification : High : 1.18~1.68V , Low : 0.59~0.84V

5. Is the measured waveform within specifications?

YES	► Go to "Component Inspection" procedure.
NO	► Repair open or short in signal circuit between HECU harness connector and wheel speed sensor harness connector, and then go to "Verification of vehicle Repair" procedure. If there is no problem in signal circuit, go to "Component Inspection" procedure.

Component Inspection

■ Wheel speed sensor circuit check

1. Lift the vehicle.
2. Ignition "ON" & Engine "OFF".
3. Turn the wheel by hand.
4. Measure waveform between signal terminal of the wheel speed sensor harness connector and chassis ground with oscilloscope.

Specification : High : 1.18~1.68V , Low : 0.59~0.84V

5. Is the measured waveform within specifications?

YES	► Fault is intermittent caused by poor connection in wheel speed sensor harness (FL). Go to "Verification of Vehicle Repair" procedure.
NO	► Substitute with a known-good Wheel speed sensor and check for proper operation. If problem is corrected, replace Wheel speed sensor and then go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information. (Start and drive vehicle in gear and maintain vehicle speed at or above 10kmh. (6.2mph))
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1201 Wheel Speed Sensor Front-LH Range / Performance / Intermittent**

General Description

The wheel speed sensor is the essential component the ABS ECU uses to calculate vehicle speed and to determine whether wheel lock occurs.

For example, rear wheel speed signal is used as a reference value, for vehicle speed, in front wheel drive vehicles, and if a difference between front and rear wheel speed occurs, then ABS control is performed.

Wheel speed sensor is active hall-sensor type.

DTC Description

The ABS ECU monitors the wheel speed sensor signal continuously.

This code is set if an abnormal speed change ratio is detected while the vehicle speed is more than 2Km/h.

Warning lamp is turned OFF unless additional faults are detected when the IG KEY is turned ON again, and wheel speed is more than 10 Km/h.

DTC Detecting Condition

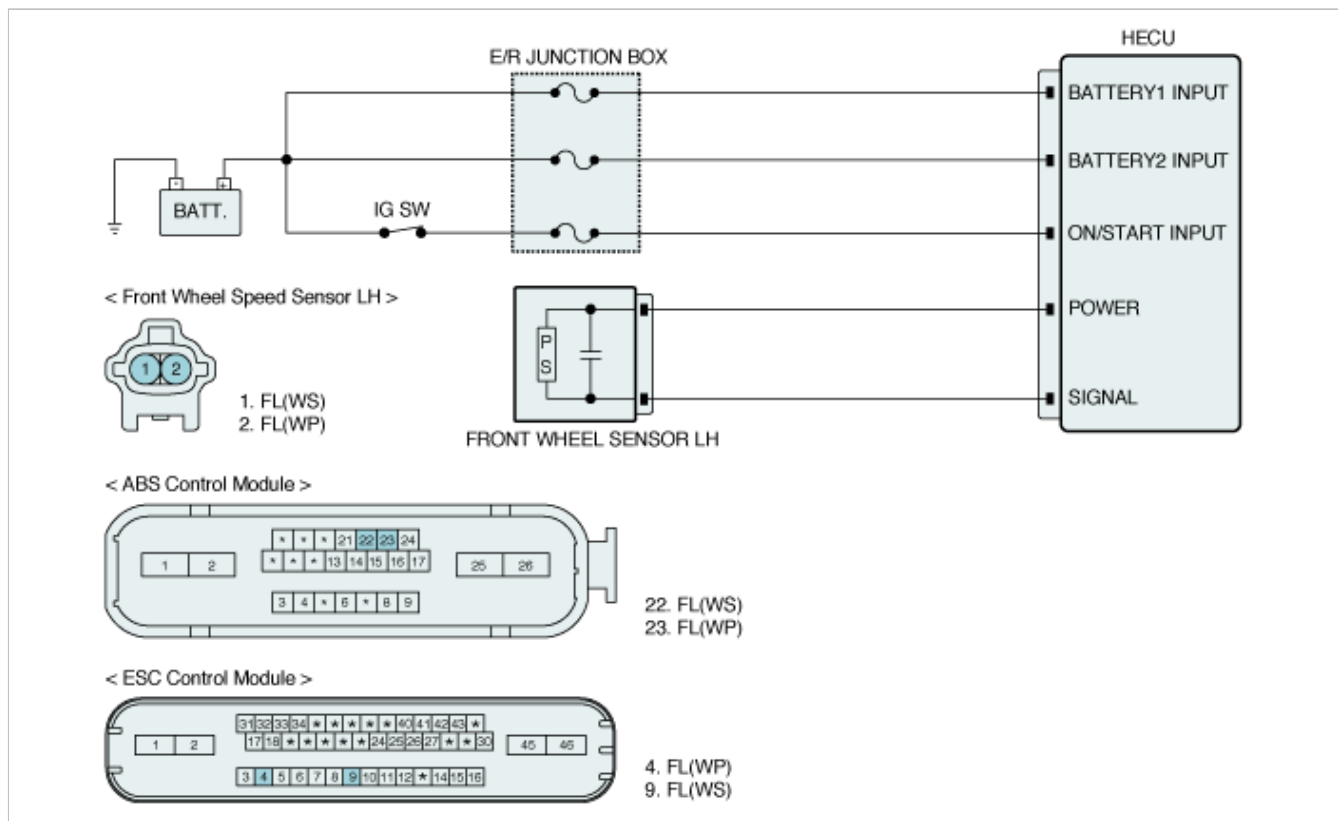
Item		Detecting Condition	Possible cause
DTC Strategy		<ul style="list-style-type: none"> Signal monitoring 	<ul style="list-style-type: none"> Improper installation of wheel speed sensor Abnormal Rotor and wheel bearing Faulty Wheel speed sensor
Enable Conditions	Case1	<ul style="list-style-type: none"> 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. 	
	Case2	<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 70g[(17.5km/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 70g at each wheel exceed 20 times, controller recognize the failure. <ul style="list-style-type: none"> The counter of speed jump is cleared every 30min. This monitoring is performed for the period that the velocity of each wheel exceeds 2km/h. 	
Fail Safe		<ol style="list-style-type: none"> Only one wheel failure : Inhibit the ABS/ESCcontrol, allow the EBD control. The ABS/ESC warning lamps are activated, the EBD warning lamp is not activated. More than two wheels failure : The ABS/EBD/ESC 	

functions are inhibited. The ABS/EBD/ESC warning lamps are activated.

Specification

Sensor Type	Output Voltage		Airgap
	HIGH	LOW	
Active Type	1.18~1.68V	0.59~0.84V	0.4~1.5mm

Diagnostic Circuit Diagram



Signal Waveform & Data

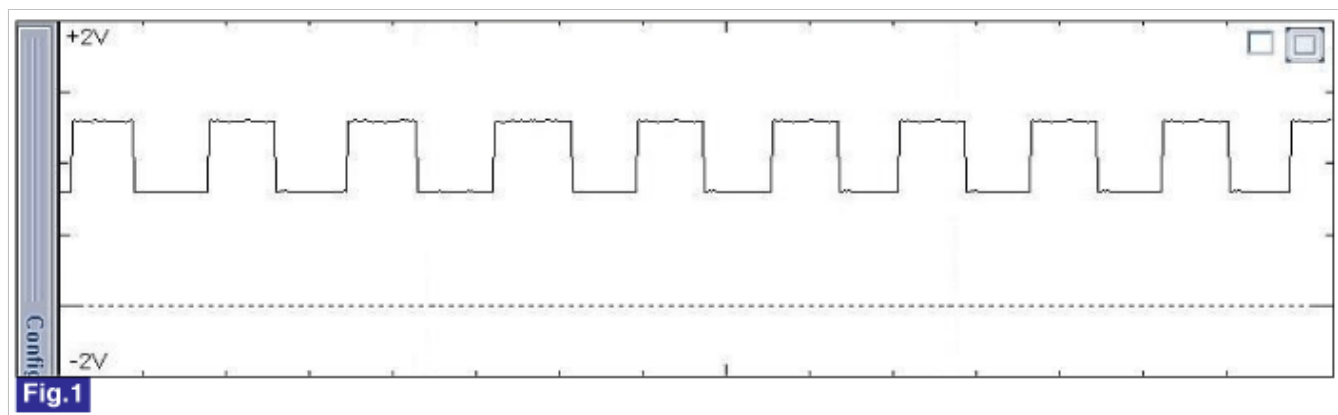


Fig 1) Normal waveform of wheel speed sensor (Active type)

- High : Approx. 1.4V, Low : Approx. 0.7V

Monitor Scantool Data

1. Ignition "ON" & Engine "ON".
2. Connect scantool to Data Link Connector(DLC)

3. Start and drive vehicle in gear and maintain vehicle speed at or above 40km/h. (24mph)
4. Monitor the "WHEEL SPEED(FL)" parameter on the Scantool.

Specification :

Compare with other parameters related to wheel speed sensor.
If it is the same as other parameters, it is in normal condition.

5. Is parameter displayed within specifications?

YES	<p>► Fault is intermittent caused by poor connection in wheel speed sensor harness (FL) and/or HECU's connector or was repaired and HECU memory was not cleared.</p> <p>Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.</p> <p>Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.</p>
NO	<p>► Go to "Component Inspection" Procedure.</p>

Component Inspection

■ Wheel speed sensor circuit check

1. Lift the vehicle.
2. Ignition "ON" & Engine "OFF".
3. Turn the wheel by hand.
4. Measure waveform between signal terminal of the wheel speed sensor harness connector and chassis ground with oscilloscope.

Specification : High : 1.18~1.68V , Low : 0.59~0.84V

5. Is the measured waveform within specifications?

YES	<p>► Fault is intermittent caused by faulty HECU, wheel speed sensor or external noise, an interference between harnesses.</p> <p>Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.</p> <p>Repair as necessary and then go to "Verification of Vehicle Repair" procedure.</p> <p>If there is no problem in signal circuit, Substitute with a known-good HECU and check for proper operation.</p> <p>If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.</p>
NO	<p>► Check for improper installation of wheel speed sensor. If NG, repair as necessary and then go to "Verification of vehicle Repair" procedure.</p> <p>Check for damage of rotor teeth or wheel bearing. If NG, repair as necessary and then go to "Verification of vehicle Repair" procedure.</p> <p>Substitute with a known-good Wheel speed sensor and check for proper operation.</p> <p>If problem is corrected, replace Wheel speed sensor and then go to "Verification of Vehicle Repair" procedure.</p>

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information. (Start and drive vehicle in gear and maintain vehicle speed at or above 40kmh. (24mph))
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1202 Wheel Speed Sensor Front-LH Invalid/no Signal**

General Description

The wheel speed sensor is the essential component the ABS ECU uses to calculate vehicle speed and to determine whether wheel lock occurs.

For example, rear wheel speed signal is used as a reference value, for vehicle speed, in front wheel drive vehicles, and if a difference between front and rear wheel speed occurs, then ABS control is performed.

Wheel speed sensor is active hall-sensor type.

DTC Description

The ABS ECU monitors the wheel speed sensor signal continuously.

This code is set when the sensor air gap is out of specified range or when the ABS control cycle is continued abnormally.

The HECU checks for air gap malfunctioning by monitoring the sensor signal at speeds between 2Km/h to 10 Km/h.

Warning lamp is turned OFF unless additional faults are detected when the IG KEY is turned ON again, and wheel speed is more than 10 Km/h (6.2mph).

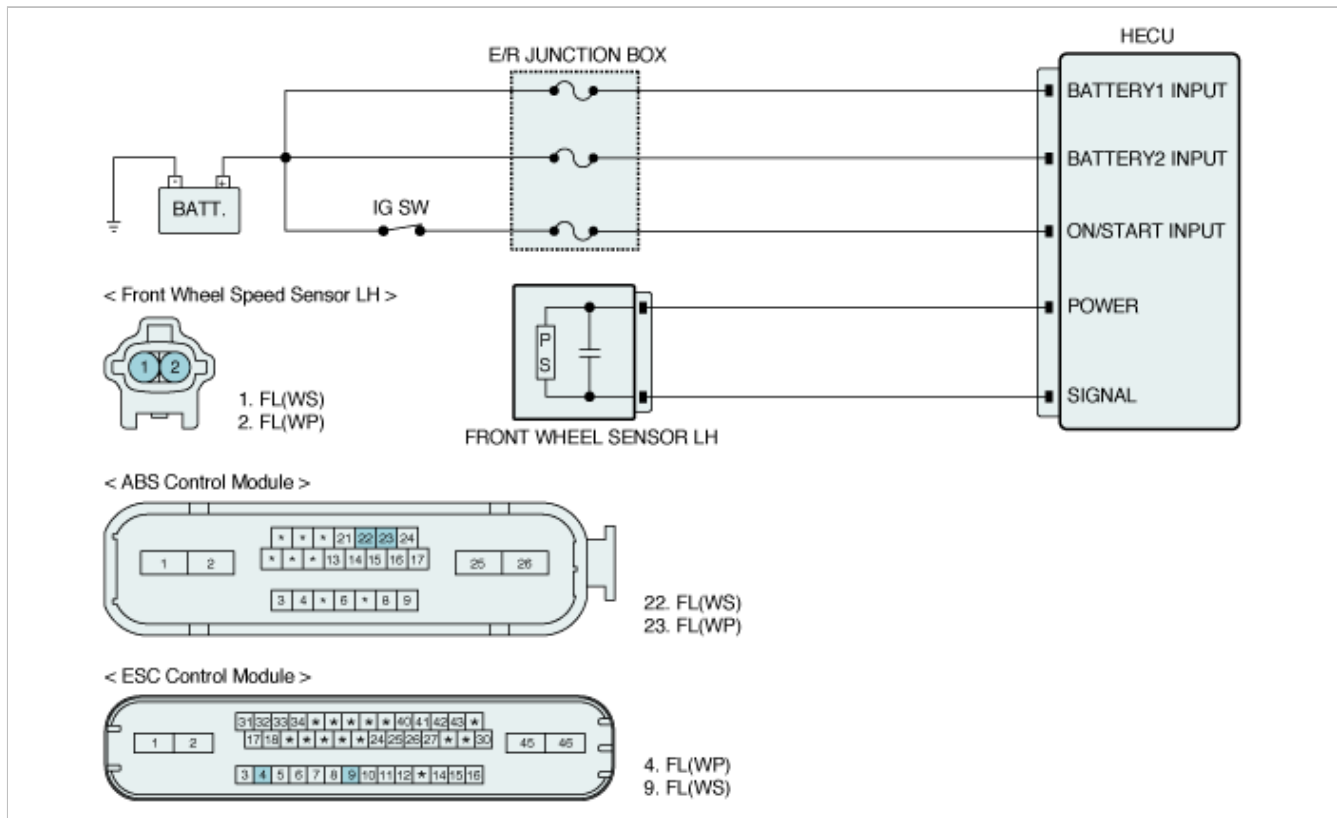
DTC Detecting Condition

Item		Detecting Condition	Possible cause
DTC Strategy		• Signal monitoring	<ul style="list-style-type: none"> • Improper installation of wheel speed sensor • Abnormal Rotor and wheel bearing • Faulty Wheel speed sensor
Case1 (Large Air-Gap)	Enable Conditions	<ul style="list-style-type: none"> • When the minimum wheel velocity is 2km/h and the velocity of other wheels exceed 10km/h (6.2mph) with the acceleration of < 0.4g, the controller start comparing the velocity of other wheels except the min. wheel. if their difference below 4km/h (2.5mph) is continued for 140msec, Otherwise, if their difference beyond 4km/h (2.5mph) or >0.4g is continued for 2 minutes. • In < 0.4g, when the velocity of more two wheels is 2km/h (1.2mph) and the max. wheel velocity exceeds 10km/h (6.2mph), the condition is continued for 20 sec. Otherwise, In >0.4g, the condition is 2 minutes. • After velocity of 4 wheel exceeds 10km/h (6.2mph), when velocity of 1 wheel or 2 wheel is 2km/h (1.2mph) and difference of other 2 wheel velocity is less than 4km/h (2.5mph) under that those velocity is more than 10km/h (6.2mph), if that conditions are continued for 12 seconds. - This monitoring is performed for the period that the minimum velocity rises from 2km/h (1.2mph) to 10km/h (6.2mph). 	
Case2 (long term ABS mode)	Enable Conditions	<ul style="list-style-type: none"> • During the ABS control cycle, if the wheel velocity of 2km/h (1.2mph) is lasted for more than 12sec. • If the ABS control cycle is continued for more than 36sec. 	
Fail Safe		<ol style="list-style-type: none"> 1. Only one wheel failure : Inhibit the ABS/ESC control, allow the EBD control. The ABS/ESC warning lamps are activated, the EBD warning lamp is not activated. 2. More than two wheels failure : The ABS/EBD/ESC functions are inhibited. The ABS/EBD/ESC warning lamps are activated. 	

Specification

Sensor Type	Output Voltage		Airgap
	HIGH	LOW	
Active Type	1.18~1.68V	0.59~0.84V	0.4~1.5mm

Diagnostic Circuit Diagram



Signal Waveform & Data

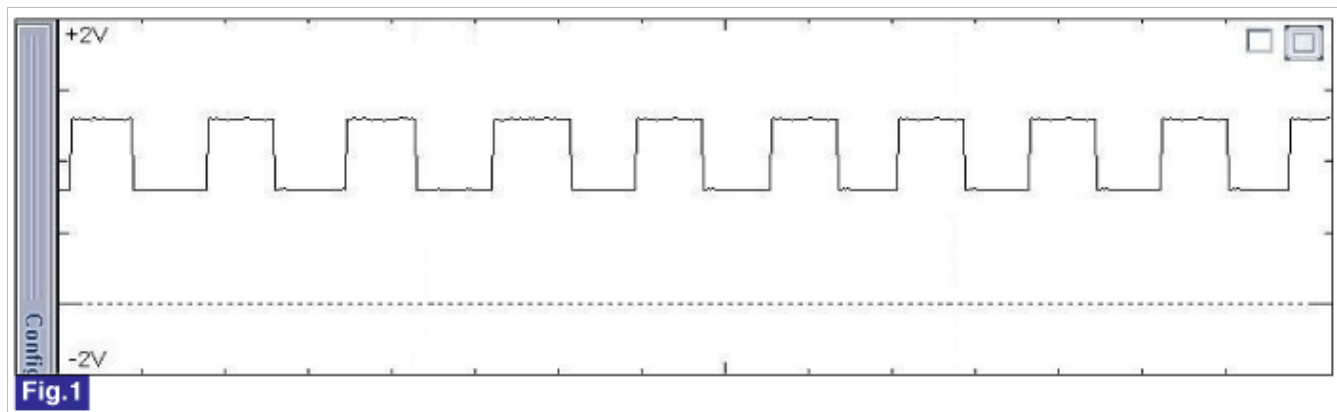


Fig 1) Normal waveform of wheel speed sensor (Active type)

- High : Approx. 1.4V, Low : Approx. 0.7V

Monitor Scantool Data

1. Ignition "ON" & Engine "ON".
2. Connect scantool to Data Link Connector(DLC)
3. Start and drive vehicle in gear and maintain vehicle speed at or above 10km/h. (6.2mph)
4. Monitor the "WHEEL SPEED(FL)" parameter on the Scantool.

Specification :

Compare with other parameters related to wheel speed sensor.
If it is the same as other parameters, it is in normal condition.

5. Is parameter displayed within specifications?

YES	<p>► Fault is intermittent caused by poor connection in wheel speed sensor harness (FL) and/or HECU's connector or was repaired and HECU memory was not cleared.</p> <p>Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.</p> <p>Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.</p>
NO	<p>► Go to "Component Inspection" Procedure.</p>

Component Inspection

■ Wheel speed sensor circuit check

1. Lift the vehicle.
2. Ignition "ON" & Engine "OFF".
3. Turn the wheel by hand.
4. Measure waveform between signal terminal of the wheel speed sensor harness connector and chassis ground with oscilloscope.

Specification : High : 1.18~1.68V , Low : 0.59~0.84V

5. Is the measured waveform within specifications?

YES	<p>► Substitute with a known-good HECU and check for proper operation.</p> <p>If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.</p>
NO	<p>► Check for improper installation of wheel speed sensor. If NG, repair as necessary and then go to "Verification of vehicle Repair" procedure.</p> <p>Check for damage of rotor teeth or wheel bearing. If NG, repair as necessary and then go to "Verification of vehicle Repair" procedure.</p> <p>Substitute with a known-good Wheel speed sensor and check for proper operation.</p> <p>If problem is corrected, replace Wheel speed sensor and then go to "Verification of Vehicle Repair" procedure.</p>

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information. (Start and drive vehicle in gear and maintain vehicle speed at or above 10kmh. (6.2mph))
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	<p>► Go to the applicable troubleshooting procedure.</p>
NO	<p>► System performing to specification at this time.</p>

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1203 Wheel Speed Sensor Front-RH Open/Short**

General Description

The wheel speed sensor is the essential component the ABS ECU uses to calculate vehicle speed and to determine whether wheel lock occurs.

For example, rear wheel speed signal is used as a reference value, for vehicle speed, in front wheel drive vehicles, and if a difference between front and rear wheel speed occurs, then ABS control is performed.

Wheel speed sensor is active hall-sensor type.

DTC Description

The ABS ECU monitors the wheel speed sensor circuit continuously.

If the sensor signal current is continuously out of the specified range for 140msec, then the HECU determines that the circuit is open/short, and sets this code.

Warning lamp is turned OFF unless additional faults are detected when the IG KEY is turned ON again, and wheel speed is more than 10 Km/h.

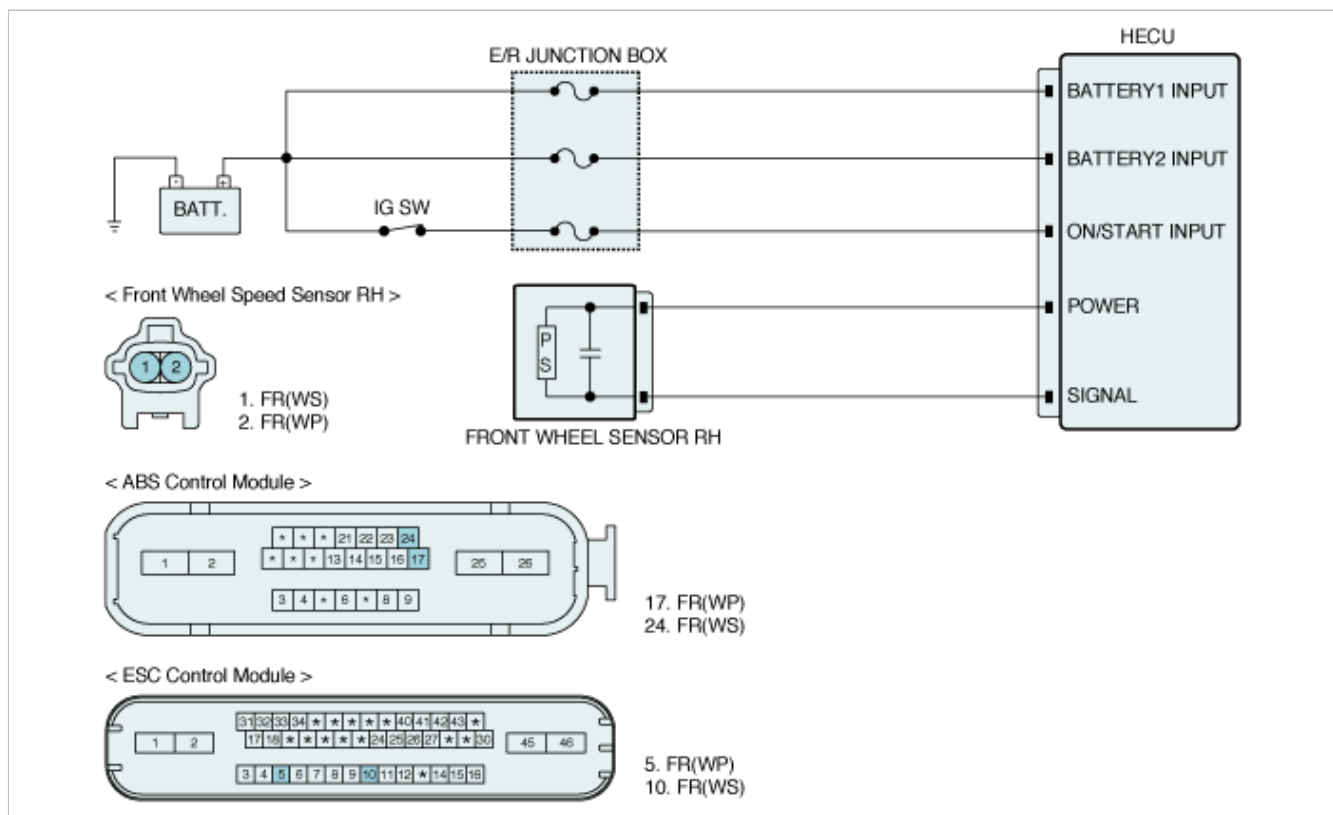
DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	• Current Monitoring	• Open or short of Wheel speed sensor circuit • Faulty Wheel speed sensor
Enable Conditions	• When the sensor signal current is continuously out of the specified range of $4\text{ mA} \pm 10\%$ ~ $22\text{ mA} \pm 10\%$ for 140msec.	
Fail Safe	1. Only one wheel failure : Inhibit the ABS/ESC control, allow the EBD control. The ABS/ESC warning lamps are activated, the EBD warning lamp is not activated. 2. More than two wheels failure : The ABS/EBD/ESC functions are inhibited. The ABS/EBD/ESC warning lamps are activated.	

Specification

Sensor Type	Output Voltage		Airgap
	HIGH	LOW	
Active Type	1.18~1.68V	0.59~0.84V	0.4~1.5mm

Diagnostic Circuit Diagram



Signal Waveform & Data

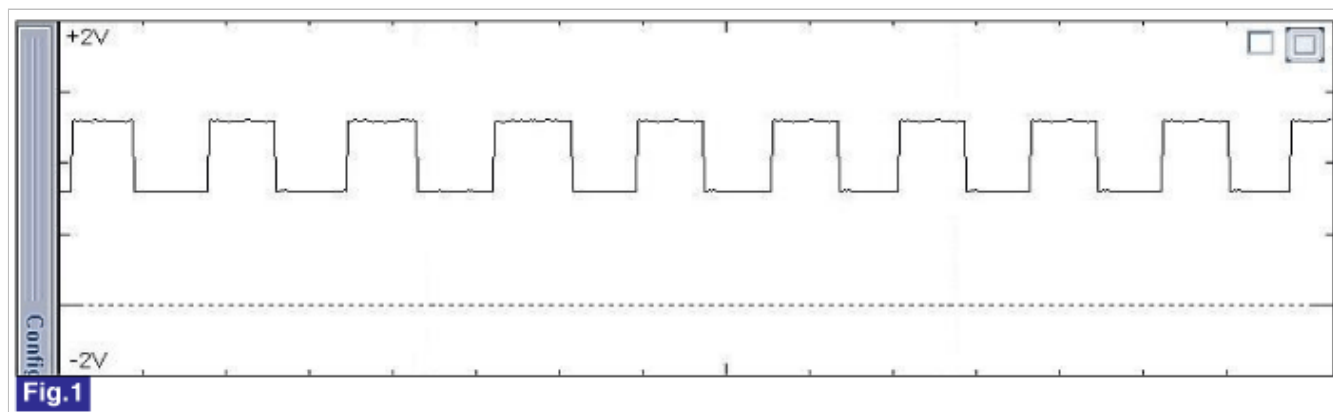


Fig 1) Normal waveform of wheel speed sensor (Active type)

- High : Approx. 1.4V, Low : Approx. 0.7V

Monitor Scantool Data

1. Ignition "ON" & Engine "ON".
2. Connect scantool to Data Link Connector(DLC)
3. Start and drive vehicle in gear and maintain vehicle speed at or above 10km/h. (6.2mph)
4. Monitor the "WHEEL SPEED(FR)" parameter on the Scantool.

Specification :

Compare with other parameters related to wheel speed sensor.
If it is the same as other parameters, it is in normal condition.

5. Is parameter displayed within specifications?

YES

► Fault is intermittent caused by poor connection in wheel speed sensor harness (FR) and/or HECU's connector or was repaired and HECU memory was not cleared.

	Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Terminal and Connector Inspection" procedure.

Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Power Circuit Inspection" procedure.

Power Circuit Inspection

■ Open or Short Check

1. Ignition "ON" & Engine "OFF".
2. Measure voltage between power terminal of the wheel speed sensor harness connector and chassis ground.

Specification : Approx. B+

3. Is the measured value within specifications?

YES	► Go to "Signal Circuit Inspection" procedure.
NO	► Repair open or short in power circuit between HECU harness connector and wheel speed sensor harness connector and then go to "Verification of vehicle Repair" procedure. If there is no problem in Power circuit, Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.

Signal Circuit Inspection

■ Wheel speed sensor circuit check

1. Lift the vehicle.
2. Ignition "ON" & Engine "OFF".
3. Turn the wheel by hand.
4. Measure waveform between wheel speed sensor signal terminal of the HECU harness connector and chassis ground.

Specification : High : 1.18~1.68V , Low : 0.59~0.84V

5. Is the measured waveform within specifications?

YES	► Go to "Component Inspection" procedure.
NO	► Repair open or short in signal circuit between HECU harness connector and wheel speed sensor harness connector, and then go to "Verification of vehicle Repair" procedure. If there is no problem in signal circuit, go to "Component Inspection" procedure.

Component Inspection

■ Wheel speed sensor circuit check

1. Lift the vehicle.
2. Ignition "ON" & Engine "OFF".
3. Turn the wheel by hand.
4. Measure waveform between signal terminal of the wheel speed sensor harness connector and chassis ground with oscilloscope.

Specification : High : 1.18~1.68V , Low : 0.59~0.84V

5. Is the measured waveform within specifications?

YES	► Fault is intermittent caused by poor connection in wheel speed sensor harness (FR). Go to "Verification of Vehicle Repair" procedure.
NO	► Substitute with a known-good Wheel speed sensor and check for proper operation. If problem is corrected, replace Wheel speed sensor and then go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information. (Start and drive vehicle in gear and maintain vehicle speed at or above 10kmh. (6.2mph))
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1204 Wheel Speed Sensor Front-RH Range / Performance / Intermittent**

General Description

The wheel speed sensor is the essential component the ABS ECU uses to calculate vehicle speed and to determine whether wheel lock occurs.

For example, rear wheel speed signal is used as a reference value, for vehicle speed, in front wheel drive vehicles, and if a difference between front and rear wheel speed occurs, then ABS control is performed.

Wheel speed sensor is active hall-sensor type.

DTC Description

The ABS ECU monitors the wheel speed sensor signal continuously.

This code is set if an abnormal speed change ratio is detected while the vehicle speed is more than 2Km/h.

Warning lamp is turned OFF unless additional faults are detected when the IG KEY is turned ON again, and wheel speed is more than 10 Km/h.

DTC Detecting Condition

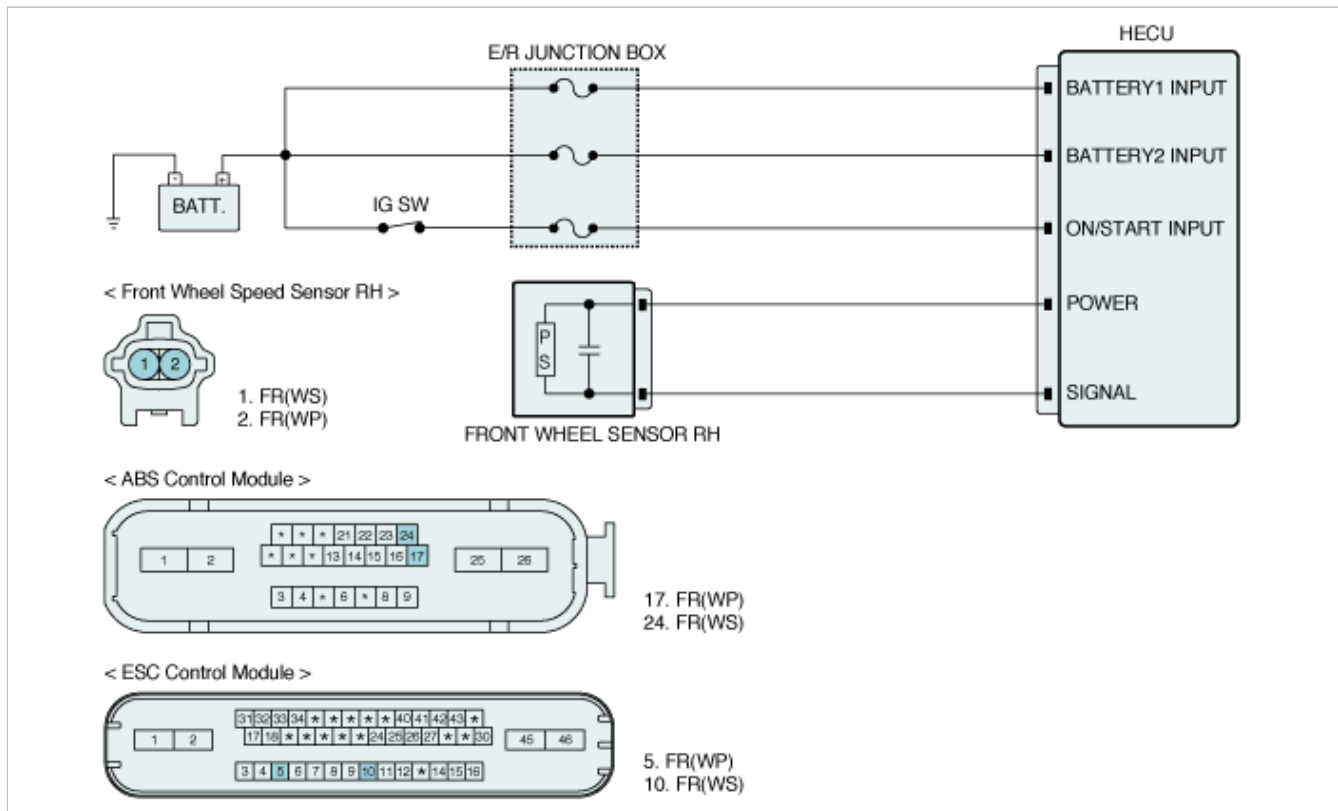
Item		Detecting Condition	Possible cause
DTC Strategy		<ul style="list-style-type: none"> Signal monitoring 	<ul style="list-style-type: none"> Improper installation of wheel speed sensor Abnormal Rotor and wheel bearing Faulty Wheel speed sensor
Enable Conditions	Case1	<ul style="list-style-type: none"> 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. 	
	Case2	<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 70g[(17.5km/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 70g at each wheel exceed 20 times, controller recognize the failure. <ul style="list-style-type: none"> The counter of speed jump is cleared every 30min. This monitoring is performed for the period that the velocity of each wheel exceeds 2km/h. 	
Fail Safe		<ol style="list-style-type: none"> Only one wheel failure : Inhibit the ABS/ESC control, allow the EBD control. The ABS/ESC warning lamps are activated, the EBD warning lamp is not activated. More than two wheels failure : The ABS/EBD/ESC 	

functions are inhibited. The ABS/EBD/ESC warning lamps are activated.

Specification

Sensor Type	Output Voltage		Airgap
	HIGH	LOW	
Active Type	1.18~1.68V	0.59~0.84V	0.4~1.5mm

Diagnostic Circuit Diagram



Signal Waveform & Data

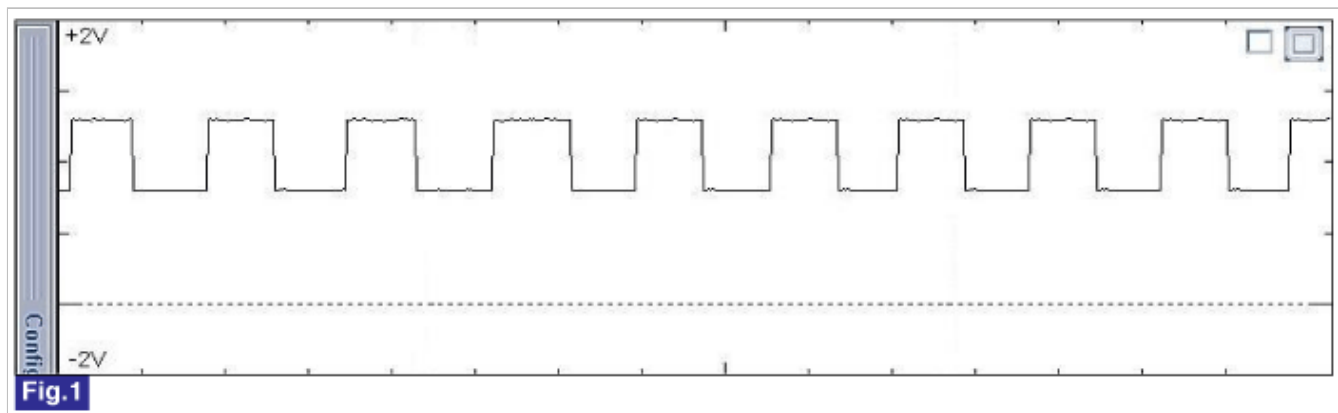


Fig 1) Normal waveform of wheel speed sensor (Active type)

- High : Approx. 1.4V, Low : Approx. 0.7V0.59~0.84V

Monitor Scantool Data

1. Ignition "ON" & Engine "ON".
2. Connect scantool to Data Link Connector(DLC)

3. Start and drive vehicle in gear and maintain vehicle speed at or above 40km/h. (24mph)
4. Monitor the "WHEEL SPEED(FR)" parameter on the Scantool.

Specification :

Compare with other parameters related to wheel speed sensor.
If it is the same as other parameters, it is in normal condition.

5. Is parameter displayed within specifications?

YES	<p>► Fault is intermittent caused by poor connection in wheel speed sensor harness (FR) and/or HECU's connector or was repaired and HECU memory was not cleared.</p> <p>Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.</p> <p>Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.</p>
NO	<p>► Go to "Component Inspection" Procedure.</p>

Component Inspection

■ Wheel speed sensor circuit check

1. Lift the vehicle.
2. Ignition "ON" & Engine "OFF".
3. Turn the wheel by hand.
4. Measure waveform between signal terminal of the wheel speed sensor harness connector and chassis ground with oscilloscope.

Specification : High : 1.18~1.68V , Low : 0.59~0.84V

5. Is the measured waveform within specifications?

YES	<p>► Fault is intermittent caused by faulty HECU, wheel speed sensor or external noise, an interference between harnesses, was repaired and HECU memory was not cleared.</p> <p>Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.</p> <p>Repair as necessary and then go to "Verification of Vehicle Repair" procedure.</p> <p>If there is no problem in signal circuit, Substitute with a known-good HECU and check for proper operation.</p> <p>If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.</p>
NO	<p>► Check for improper installation of wheel speed sensor. If NG, repair as necessary and then go to "Verification of vehicle Repair" procedure.</p> <p>Check for damage of rotor teeth or wheel bearing. If NG, repair as necessary and then go to "Verification of vehicle Repair" procedure.</p> <p>Substitute with a known-good Wheel speed sensor and check for proper operation.</p> <p>If problem is corrected, replace Wheel speed sensor and then go to "Verification of Vehicle Repair" procedure.</p>

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information. (Start and drive vehicle in gear and maintain vehicle speed at or above 40kmh. (24mph))
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1205 Wheel Speed Sensor Front-RH Invalid/no Signal**

General Description

The wheel speed sensor is the essential component the ABS ECU uses to calculate vehicle speed and to determine whether wheel lock occurs.

For example, rear wheel speed signal is used as a reference value, for vehicle speed, in front wheel drive vehicles, and if a difference between front and rear wheel speed occurs, then ABS control is performed.

Wheel speed sensor is active hall-sensor type.

DTC Description

The ABS ECU monitors the wheel speed sensor signal continuously.

This code is set when the sensor air gap is out of specified range or when the ABS control cycle is continued abnormally.

The HECU checks for air gap malfunctioning by monitoring the sensor signal at speeds between 2Km/h to 10 Km/h.

Warning lamp is turned OFF unless additional faults are detected when the IG KEY is turned ON again, and wheel speed is more than 10 Km/h (6.2mph).

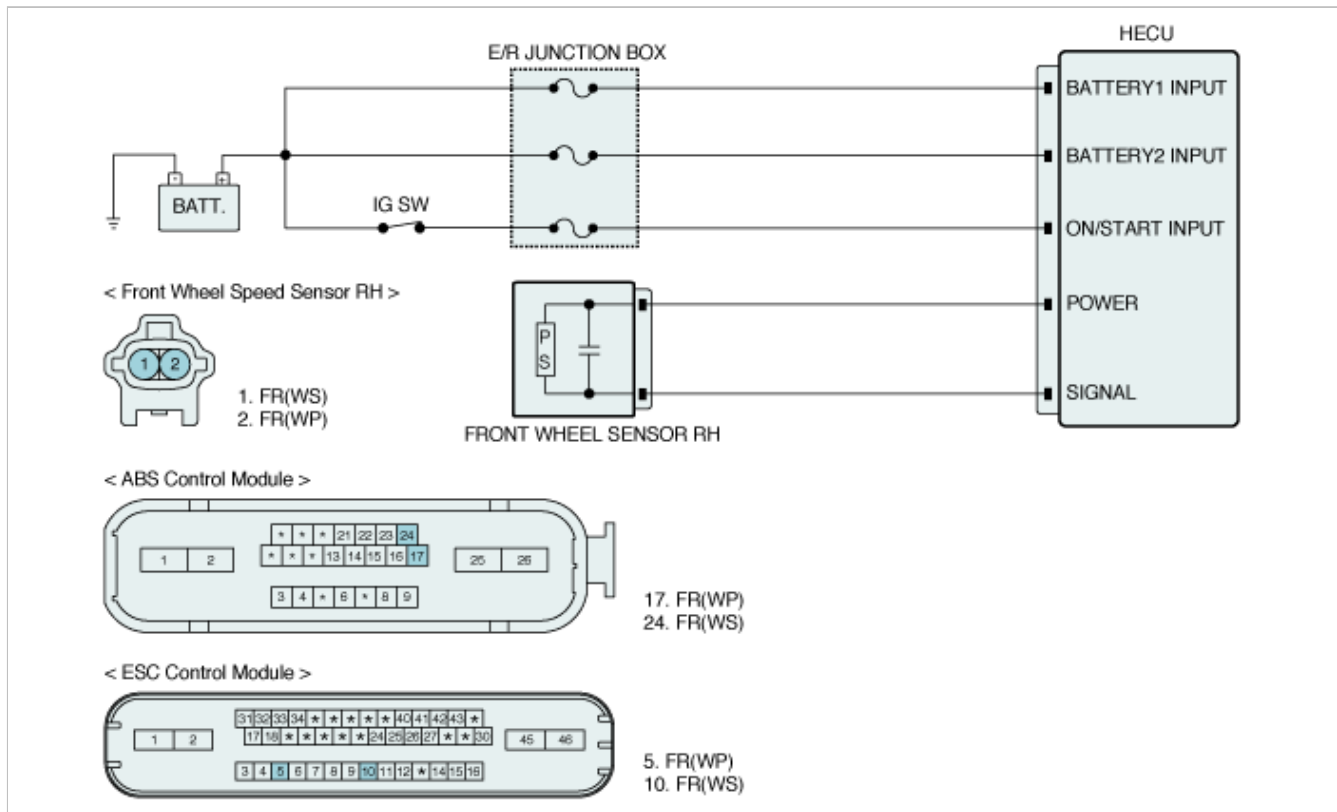
DTC Detecting Condition

Item		Detecting Condition	Possible cause
DTC Strategy		• Signal monitoring	<ul style="list-style-type: none"> • Improper installation of wheel speed sensor • Abnormal Rotor and wheel bearing • Faulty Wheel speed sensor
Case1 (Large Air-Gap)	Enable Conditions	<ul style="list-style-type: none"> • When the minimum wheel velocity is 2km/h and the velocity of other wheels exceed 10km/h (6.2mph) with the acceleration of < 0.4g, the controller start comparing the velocity of other wheels except the min. wheel. if their difference below 4km/h (2.5mph) is continued for 140msec, Otherwise, if their difference beyond 4km/h (2.5mph) or >0.4g is continued for 2 minutes. • In < 0.4g, when the velocity of more two wheels is 2km/h (1.2mph) and the max. wheel velocity exceeds 10km/h (6.2mph), the condition is continued for 20 sec. Otherwise, In >0.4g, the condition is 2 minutes. • After velocity of 4 wheel exceeds 10km/h (6.2mph), when velocity of 1 wheel or 2 wheel is 2km/h (1.2mph) and difference of other 2 wheel velocity is less than 4km/h (2.5mph) under that those velocity is more than 10km/h (6.2mph), if that conditions are continued for 12 seconds. - This monitoring is performed for the period that the minimum velocity rises from 2km/h (1.2mph) to 10km/h (6.2mph). 	
Case2 (long term ABS mode)	Enable Conditions	<ul style="list-style-type: none"> • During the ABS control cycle, if the wheel velocity of 2km/h (1.2mph) is lasted for more than 12sec. • If the ABS control cycle is continued for more than 36 sec. 	
Fail Safe		<ol style="list-style-type: none"> 1. Only one wheel failure : Inhibit the ABS/ESC control, allow the EBD control. The ABS/ESC warning lamps are activated, the EBD warning lamp is not activated. 2. More than two wheels failure : The ABS/EBD/ESC functions are inhibited. The ABS/EBD/ESC warning lamps are activated. 	

Specification

Sensor Type	Output Voltage		Airgap
	HIGH	LOW	
Active Type	1.18~1.68V	0.59~0.84V	0.4~1.5mm

Diagnostic Circuit Diagram



Signal Waveform & Data

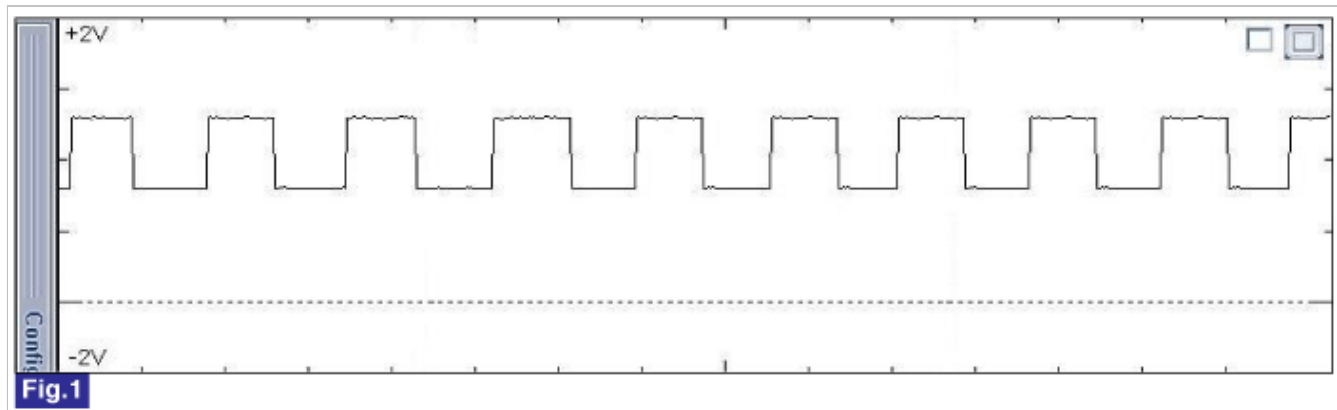


Fig 1) Normal waveform of wheel speed sensor (Active type)

- High : Approx. 1.4V, Low : Approx. 0.7V

Monitor Scantool Data

1. Ignition "ON" & Engine "ON".
2. Connect scantool to Data Link Connector(DLC)
3. Start and drive vehicle in gear and maintain vehicle speed at or above 10km/h. (6.2mph)
4. Monitor the "WHEEL SPEED(FR)" parameter on the Scantool.

Specification :

Compare with other parameters related to wheel speed sensor.
If it is the same as other parameters, it is in normal condition.

5. Is parameter displayed within specifications?

YES	<p>► Fault is intermittent caused by poor connection in wheel speed sensor harness (FR) and/or HECU's connector or was repaired and HECU memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.</p>
NO	<p>► Go to "Component Inspection" Procedure.</p>

Component Inspection

■ Wheel speed sensor circuit check

1. Lift the vehicle.
2. Ignition "ON" & Engine "OFF".
3. Turn the wheel by hand.
4. Measure waveform between signal terminal of the wheel speed sensor harness connector and chassis ground with oscilloscope.

Specification : High : 1.18~1.68V , Low : 0.59~0.84V

5. Is the measured waveform within specifications?

YES	<p>► Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.</p>
NO	<p>► Check for improper installation of wheel speed sensor. If NG, repair as necessary and then go to "Verification of vehicle Repair" procedure. Check for damage of rotor teeth or wheel bearing. If NG, repair as necessary and then go to "Verification of vehicle Repair" procedure. Substitute with a known-good Wheel speed sensor and check for proper operation. If problem is corrected, replace Wheel speed sensor and then go to "Verification of Vehicle Repair" procedure.</p>

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information. (Start and drive vehicle in gear and maintain vehicle speed at or above 10kmh. (6.2mph))
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	<p>► Go to the applicable troubleshooting procedure.</p>
NO	<p>► System performing to specification at this time.</p>

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1206 Wheel Speed Sensor Rear-LH Open/Short**

General Description

The wheel speed sensor is the essential component the ABS ECU uses to calculate vehicle speed and to determine whether wheel lock occurs.

For example, rear wheel speed signal is used as a reference value, for vehicle speed, in front wheel drive vehicles, and if a difference between front and rear wheel speed occurs, then ABS control is performed.

Wheel speed sensor is active hall-sensor type.

DTC Description

The ABS ECU monitors the wheel speed sensor circuit continuously.

If the sensor signal current is continuously out of the specified range for 140msec, then the HECU determines that the circuit is open/short, and sets this code.

Warning lamp is turned OFF unless additional faults are detected when the IG KEY is turned ON again, and wheel speed is more than 10 Km/h.

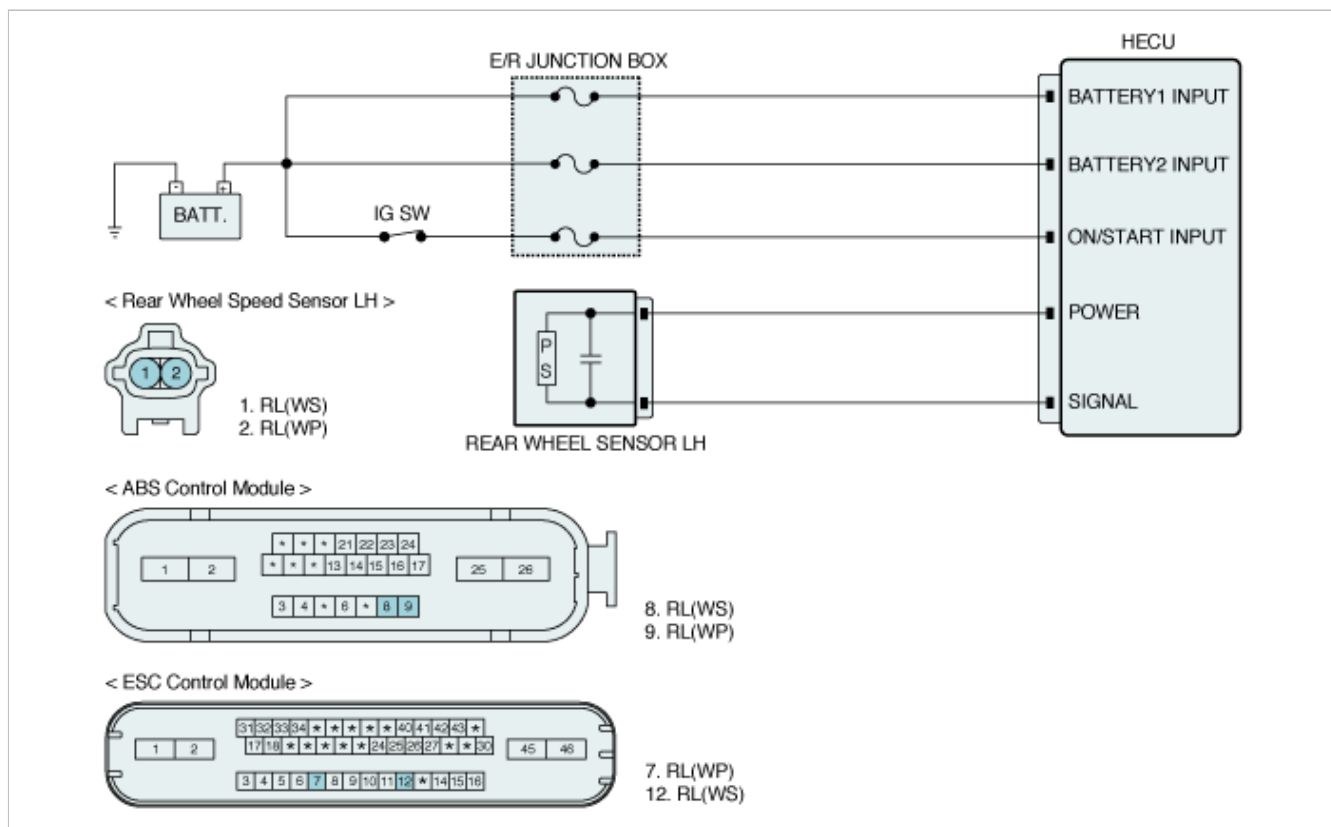
DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	• Current Monitoring	• Open or short of Wheel speed sensor circuit • Faulty Wheel speed sensor
Enable Conditions	• When the sensor signal current is continuously out of the specified range of 4 mA \pm 10% ~ 22 mA \pm 10% for 140msec.	
Fail Safe	1. Only one wheel failure : Inhibit the ABS/ESC control, allow the EBD control. The ABS/ESC warning lamps are activated, the EBD warning lamp is not activated. 2. More than two wheels failure : The ABS/EBD/ESC functions are inhibited. The ABS/EBD/ESC warning lamps are activated.	

Specification

Sensor Type	Output Voltage		Airgap
	HIGH	LOW	
Active Type	1.18~1.68V	0.59~0.84V	0.4~1.5mm

Diagnostic Circuit Diagram



Signal Waveform & Data

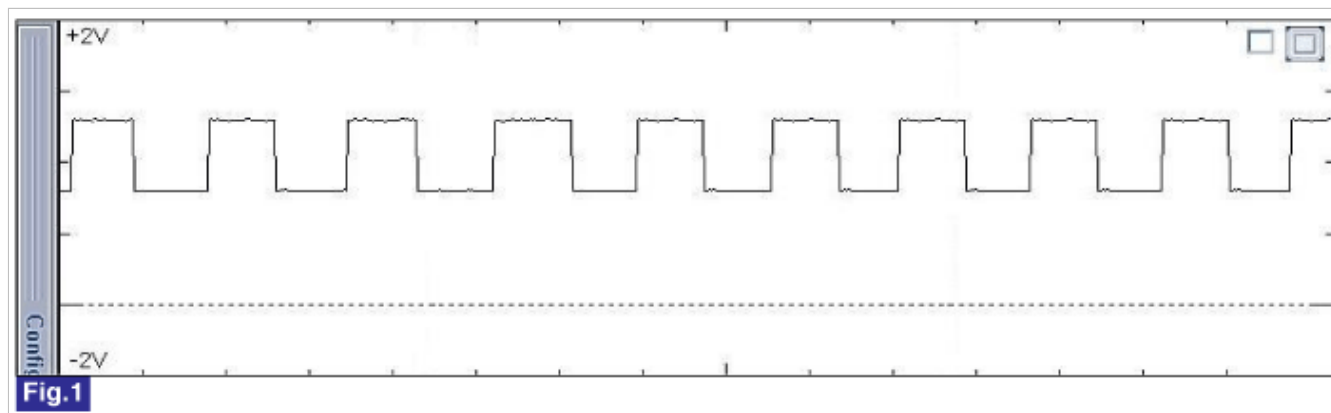


Fig 1) Normal waveform of wheel speed sensor (Active type)

- High : Approx. 1.4V, Low : Approx. 0.7V

Monitor Scantool Data

1. Ignition "ON" & Engine "ON".
2. Connect scantool to Data Link Connector(DLC)
3. Start and drive vehicle in gear and maintain vehicle speed at or above 10km/h. (6.2mph)
4. Monitor the "WHEEL SPEED(RL)" parameter on the Scantool.

Specification :

Compare with other parameters related to wheel speed sensor.
If it is the same as other parameters, it is in normal condition.

5. Is parameter displayed within specifications?

YES

► Fault is intermittent caused by poor connection in wheel speed sensor harness (RL) and/or HECU's connector or was repaired and HECU memory was not cleared.

	Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Terminal and Connector Inspection" procedure.

Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Power Circuit Inspection" procedure.

Power Circuit Inspection

■ Open or Short Check

1. Ignition "ON" & Engine "OFF".
2. Measure voltage between power terminal of the wheel speed sensor harness connector and chassis ground.

Specification : Approx. B+

3. Is the measured value within specifications?

YES	► Go to "Signal Circuit Inspection" procedure.
NO	► Repair open or short in power circuit between HECU harness connector and wheel speed sensor harness connector and then go to "Verification of vehicle Repair" procedure. If there is no problem in Power circuit, Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.

Signal Circuit Inspection

■ Wheel speed sensor circuit check

1. Lift the vehicle.
2. Ignition "ON" & Engine "OFF".
3. Turn the wheel by hand.
4. Measure waveform between wheel speed sensor signal terminal of the HECU harness connector and chassis ground.

Specification : High : 1.18~1.68V , Low : 0.59~0.84V

5. Is the measured waveform within specifications?

YES	► Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.
NO	► Repair open or short in signal circuit between HECU harness connector and wheel speed sensor harness connector, and then go to "Verification of vehicle Repair" procedure. If there is no problem in signal circuit, go to "Component Inspection" procedure.

Component Inspection

■ Wheel speed sensor circuit check

1. Lift the vehicle.
2. Ignition "ON" & Engine "OFF".
3. Turn the wheel by hand.
4. Measure waveform between signal terminal of the wheel speed sensor harness connector and chassis ground with oscilloscope.

Specification : High : 1.18~1.68V , Low : 0.59~0.84V

5. Is the measured waveform within specifications?

YES	► Fault is intermittent caused by poor connection in wheel speed sensor harness (RL). Go to "Verification of Vehicle Repair" procedure.
NO	► Substitute with a known-good Wheel speed sensor and check for proper operation. If problem is corrected, replace Wheel speed sensor and then go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information. (Start and drive vehicle in gear and maintain vehicle speed at or above 10kmh. (6.2mph))
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

General Description

The wheel speed sensor is the essential component the ABS ECU uses to calculate vehicle speed and to determine whether wheel lock occurs.

For example, rear wheel speed signal is used as a reference value, for vehicle speed, in front wheel drive vehicles, and if a difference between front and rear wheel speed occurs, then ABS control is performed.

Wheel speed sensor is active hall-sensor type.

DTC Description

The ABS ECU monitors the wheel speed sensor signal continuously.

This code is set if an abnormal speed change ratio is detected while the vehicle speed is more than 2Km/h.

Warning lamp is turned OFF unless additional faults are detected when the IG KEY is turned ON again, and wheel speed is more than 10 Km/h.

DTC Detecting Condition

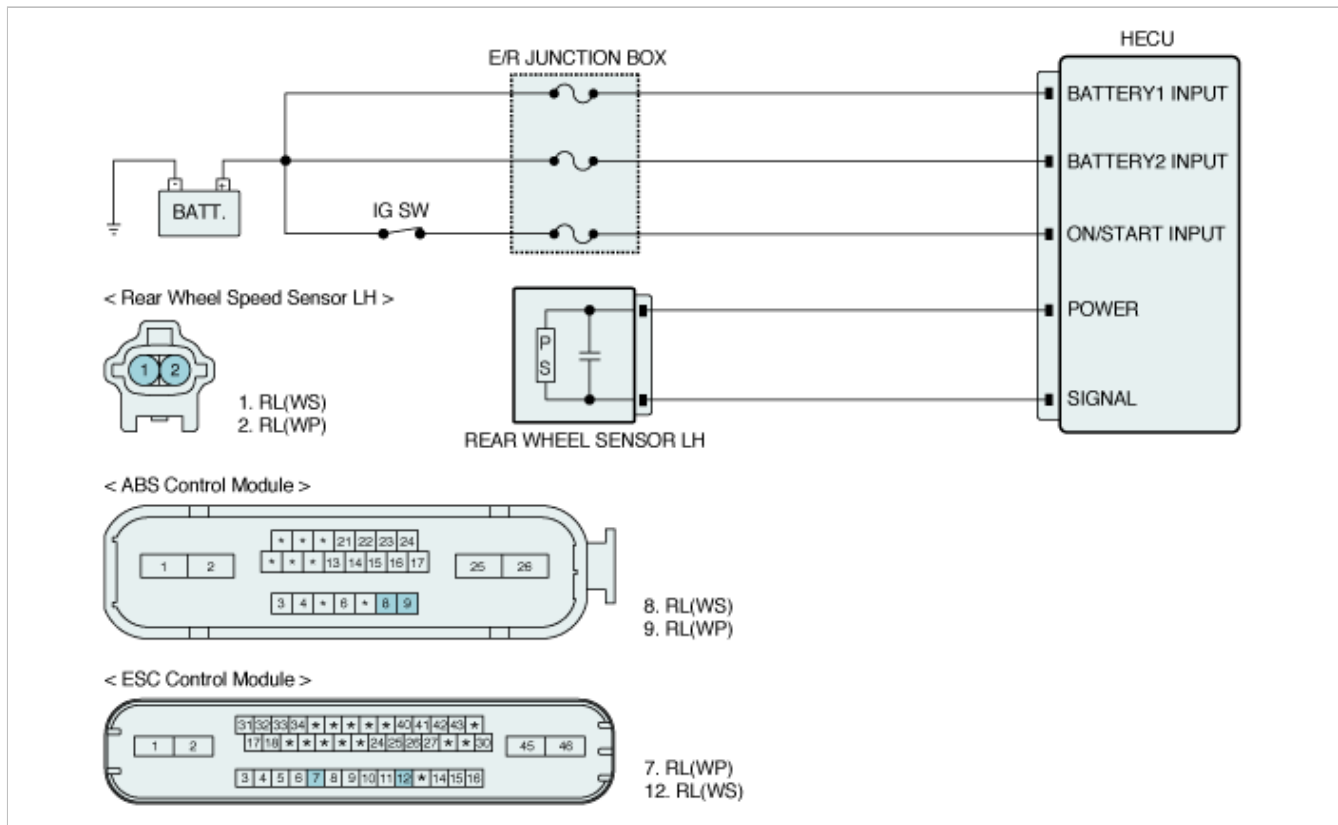
Item		Detecting Condition	Possible cause
DTC Strategy		<ul style="list-style-type: none"> Signal monitoring 	<ul style="list-style-type: none"> Improper installation of wheel speed sensor Abnormal Rotor and wheel bearing Faulty Wheel speed sensor
Enable Conditions	Case1	<ul style="list-style-type: none"> 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. 	
	Case2	<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 70g[(17.5km/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 70g at each wheel exceed 20 times, controller recognize the failure. <ul style="list-style-type: none"> The counter of speed jump is cleared every 30min. This monitoring is performed for the period that the velocity of each wheel exceeds 2km/h. 	
	Fail Safe	<ol style="list-style-type: none"> Only one wheel failure : Inhibit the ABS/ESC control, allow the EBD control. The ABS/ESC warning lamps are activated, the EBD warning lamp is not activated. More than two wheels failure : The ABS/EBD/ESC 	

functions are inhibited. The ABS/EBD/ESC warning lamps are activated.

Specification

Sensor Type	Output Voltage		Airgap
	HIGH	LOW	
Active Type	1.18~1.68V	0.59~0.84V	0.4~1.5mm

Diagnostic Circuit Diagram



Signal Waveform & Data

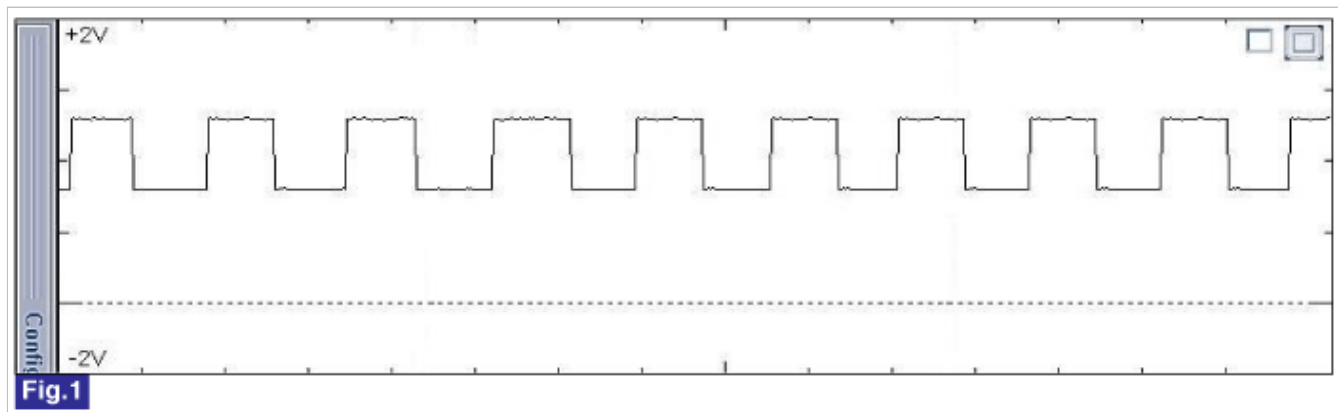


Fig 1) Normal waveform of wheel speed sensor (Active type)
 - High : Approx. 1.4V, Low : Approx. 0.7V

Monitor Scantool Data

1. Ignition "ON" & Engine "ON".

2. Connect scantool to Data Link Connector(DLC)
3. Start and drive vehicle in gear and maintain vehicle speed at or above 40km/h. (24mph)
4. Monitor the "WHEEL SPEED(RL)" parameter on the Scantool.

Specification :

Compare with other parameters related to wheel speed sensor.
If it is the same as other parameters, it is in normal condition.

5. Is parameter displayed within specifications?

YES	<p>► Fault is intermittent caused by poor connection in wheel speed sensor harness (RL) and/or HECU's connector or was repaired and HECU memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.</p>
NO	<p>► Go to "Component Inspection" Procedure.</p>

Component Inspection

■ Wheel speed sensor circuit check

1. Lift the vehicle.
2. Ignition "ON" & Engine "OFF".
3. Turn the wheel by hand.
4. Measure waveform between signal terminal of the wheel speed sensor harness connector and chassis ground with oscilloscope.

Specification : High : 1.18~1.68V , Low : 0.59~0.84V

5. Is the measured waveform within specifications?

YES	<p>► Fault is intermittent caused by faulty HECU, wheel speed sensor or external noise, an interference between harnesses, was repaired and HECU memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair as necessary and then go to "Verification of Vehicle Repair" procedure. If there is no problem in signal circuit, Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.</p>
NO	<p>► Check for improper installation of wheel speed sensor. If NG, repair as necessary and then go to "Verification of vehicle Repair" procedure. Check for damage of rotor teeth or wheel bearing. If NG, repair as necessary and then go to "Verification of vehicle Repair" procedure. Substitute with a known-good Wheel speed sensor and check for proper operation. If problem is corrected, replace Wheel speed sensor and then go to "Verification of Vehicle Repair" procedure.</p>

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information. (Start and drive vehicle in gear and maintain vehicle speed at or above 40kmh. (24mph))
4. Using a scantool, Check DTC present.

5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1208 Wheel Speed Sensor Rear-LH Invalid/no Signal**

General Description

The wheel speed sensor is the essential component the ABS ECU uses to calculate vehicle speed and to determine whether wheel lock occurs.

For example, rear wheel speed signal is used as a reference value, for vehicle speed, in front wheel drive vehicles, and if a difference between front and rear wheel speed occurs, then ABS control is performed.

Wheel speed sensor is active hall-sensor type.

DTC Description

The ABS ECU monitors the wheel speed sensor signal continuously.

This code is set when the sensor air gap is out of specified range or when the ABS control cycle is continued abnormally.

The HECU checks for air gap malfunctioning by monitoring the sensor signal at speeds between 2Km/h to 10 Km/h.

Warning lamp is turned OFF unless additional faults are detected when the IG KEY is turned ON again, and wheel speed is more than 10 Km/h (6.2mph).

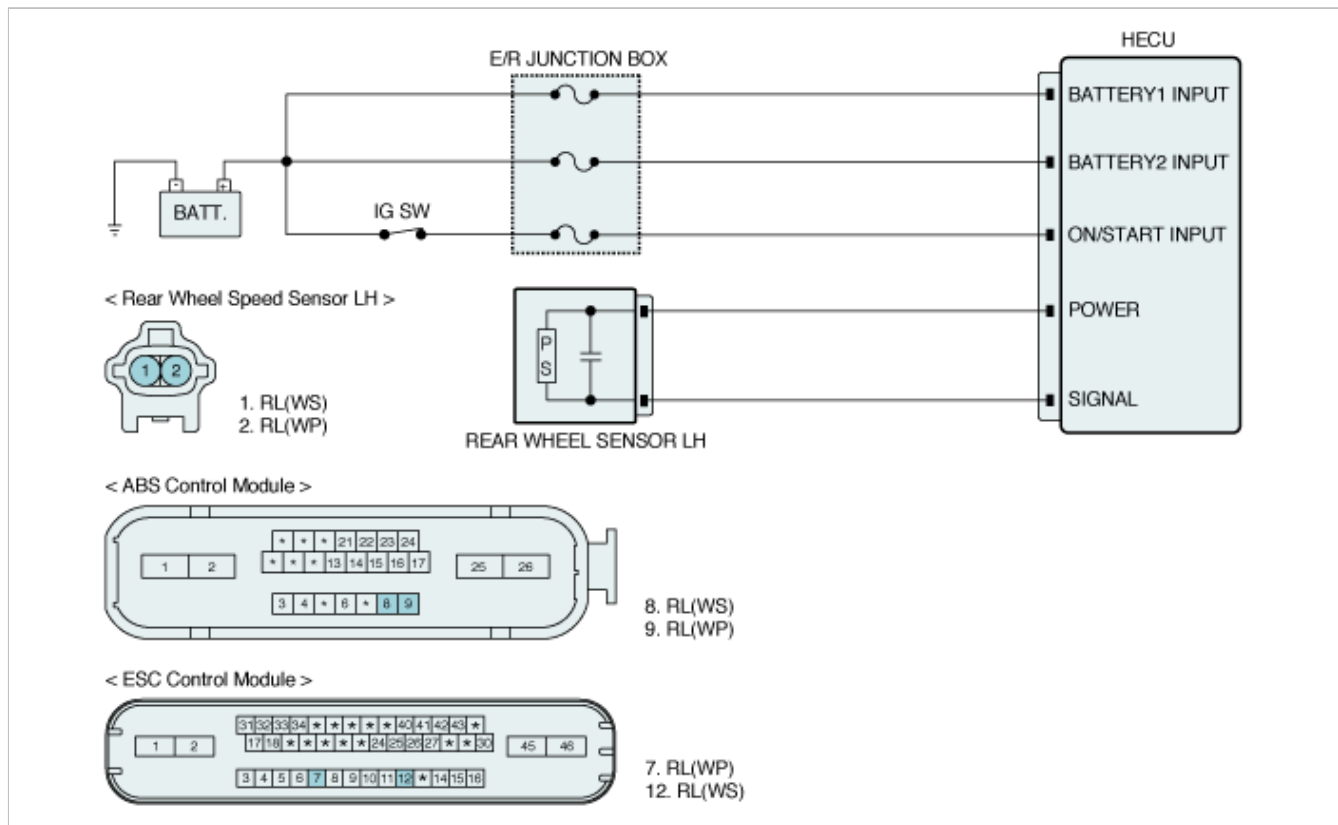
DTC Detecting Condition

Item		Detecting Condition	Possible cause
DTC Strategy		• Signal monitoring	<ul style="list-style-type: none"> • Improper installation of wheel speed sensor • Abnormal Rotor and wheel bearing • Faulty Wheel speed sensor
Case1 (Large Air-Gap)	Enable Conditions	<ul style="list-style-type: none"> • When the minimum wheel velocity is 2km/h and the velocity of other wheels exceed 10km/h (6.2mph) with the acceleration of < 0.4g, the controller start comparing the velocity of other wheels except the min. wheel. if their difference below 4km/h (2.5mph) is continued for 140msec, Otherwise, if their difference beyond 4km/h (2.5mph) or >0.4g is continued for 2 minutes. • In < 0.4g, when the velocity of more two wheels is 2km/h (1.2mph) and the max. wheel velocity exceeds 10km/h (6.2mph), the condition is continued for 20 sec. Otherwise, In >0.4g, the condition is 2 minutes. • After velocity of 4 wheel exceeds 10km/h (6.2mph), when velocity of 1 wheel or 2 wheel is 2km/h (1.2mph) and difference of other 2 wheel velocity is less than 4km/h (2.5mph) under that those velocity is more than 10km/h (6.2mph), if that conditions are continued for 12 seconds. - This monitoring is performed for the period that the minimum velocity rises from 2km/h (1.2mph) to 10km/h (6.2mph). 	
Case2 (long term ABS mode)	Enable Conditions	<ul style="list-style-type: none"> • During the ABS control cycle, if the wheel velocity of 2km/h (1.2mph) is lasted for more than 12sec. • If the ABS control cycle is continued for more than 36 sec. 	
Fail Safe		<ol style="list-style-type: none"> 1. Only one wheel failure : Inhibit the ABS/ESC control, allow the EBD control. The ABS/ESC warning lamps are activated, the EBD warning lamp is not activated. 2. More than two wheels failure : The ABS/EBD/ESC functions are inhibited. The ABS/EBD/ESC warning lamps are activated. 	

Specification

Sensor Type	Output Voltage		Airgap
	HIGH	LOW	

Diagnostic Circuit Diagram



Signal Waveform & Data

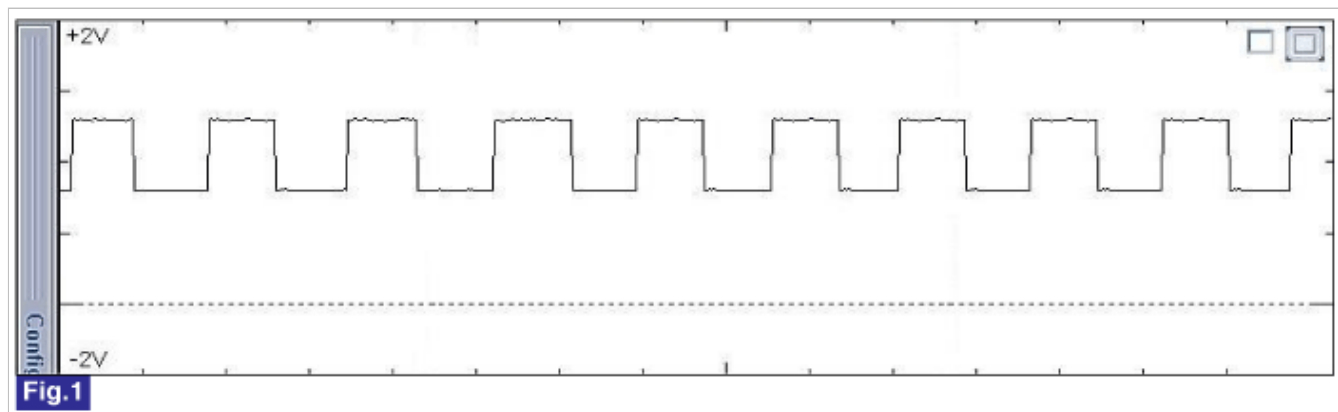


Fig 1) Normal waveform of wheel speed sensor (Active type)

- High : Approx. 1.4V, Low : Approx. 0.7V

Monitor Scantool Data

1. Ignition "ON" & Engine "ON".
2. Connect scantool to Data Link Connector(DLC)
3. Start and drive vehicle in gear and maintain vehicle speed at or above 10km/h. (6.2mph)
4. Monitor the "WHEEL SPEED(RL)" parameter on the Scantool.

Specification :

Compare with other parameters related to wheel speed sensor.
If it is the same as other parameters, it is in normal condition.

5. Is parameter displayed within specifications?

YES	<p>► Fault is intermittent caused by poor connection in wheel speed sensor harness (RL) and/or HECU's connector or was repaired and HECU memory was not cleared.</p> <p>Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.</p> <p>Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.</p>
NO	<p>► Go to "Component Inspection" Procedure.</p>

Component Inspection

■ Wheel speed sensor circuit check

1. Lift the vehicle.
2. Ignition "ON" & Engine "OFF".
3. Turn the wheel by hand.
4. Measure waveform between signal terminal of the wheel speed sensor harness connector and chassis ground with oscilloscope.

Specification : High : 1.18~1.68V , Low : 0.59~0.84V

5. Is the measured waveform within specifications?

YES	<p>► Substitute with a known-good HECU and check for proper operation.</p> <p>If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.</p>
NO	<p>► Check for improper installation of wheel speed sensor. If NG, repair as necessary and then go to "Verification of vehicle Repair" procedure.</p> <p>Check for damage of rotor teeth or wheel bearing. If NG, repair as necessary and then go to "Verification of vehicle Repair" procedure.</p> <p>Substitute with a known-good Wheel speed sensor and check for proper operation.</p> <p>If problem is corrected, replace Wheel speed sensor and then go to "Verification of Vehicle Repair" procedure.</p>

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information. (Start and drive vehicle in gear and maintain vehicle speed at or above 10kmh. (6.2mph))
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	<p>► Go to the applicable troubleshooting procedure.</p>
NO	<p>► System performing to specification at this time.</p>

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1209 Wheel Speed Sensor Rear-RH Open/Short**

General Description

The wheel speed sensor is the essential component the ABS ECU uses to calculate vehicle speed and to determine whether wheel lock occurs.

For example, rear wheel speed signal is used as a reference value, for vehicle speed, in front wheel drive vehicles, and if a difference between front and rear wheel speed occurs, then ABS control is performed.

Wheel speed sensor is active hall-sensor type.

DTC Description

The ABS ECU monitors the wheel speed sensor circuit continuously.

If the sensor signal current is continuously out of the specified range for 140msec, then the HECU determines that the circuit is open/short, and sets this code.

Warning lamp is turned OFF unless additional faults are detected when the IG KEY is turned ON again, and wheel speed is more than 10 Km/h.

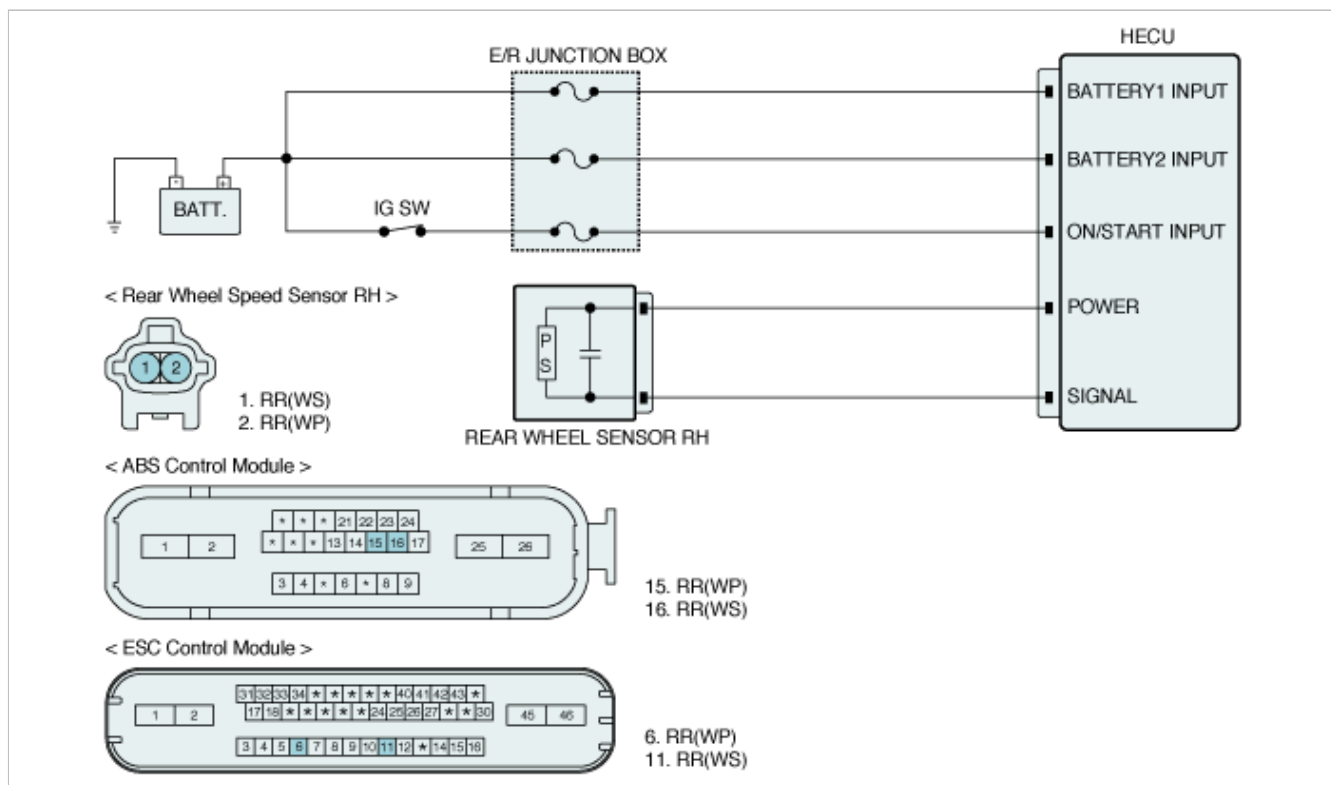
DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	• Current Monitoring	• Open or short of Wheel speed sensor circuit • Faulty Wheel speed sensor
Enable Conditions	• When the sensor signal current is continuously out of the specified range of 4 mA \pm 10% ~ 22 mA \pm 10% for 140msec.	
Fail Safe	1. Only one wheel failure : Inhibit the ABS/ESC control, allow the EBD control. The ABS/ESC warning lamps are activated, the EBD warning lamp is not activated. 2. More than two wheels failure : The ABS/EBD/ESC functions are inhibited. The ABS/EBD/ESC warning lamps are activated.	

Specification

Sensor Type	Output Voltage		Airgap
	HIGH	LOW	
Active Type	1.18~1.68V	0.59~0.84V	0.4~1.5mm

Diagnostic Circuit Diagram



Signal Waveform & Data

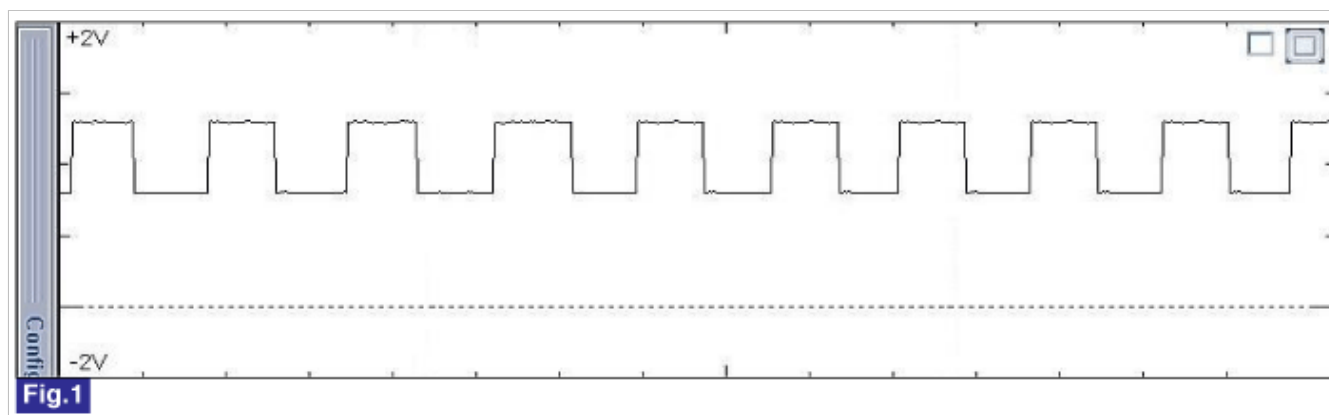


Fig 1) Normal waveform of wheel speed sensor (Active type)

- High : Approx. 1.4V, Low : Approx. 0.7V

Monitor Scantool Data

1. Ignition "ON" & Engine "ON".
2. Connect scantool to Data Link Connector(DLC)
3. Start and drive vehicle in gear and maintain vehicle speed at or above 10km/h. (6.2mph)
4. Monitor the "WHEEL SPEED(RR)" parameter on the Scantool.

Specification :

Compare with other parameters related to wheel speed sensor.

If it is the same as other parameters, it is in normal condition.

5. Is parameter displayed within specifications?

YES

► Fault is intermittent caused by poor connection in wheel speed sensor harness (RR) and/or HECU's connector or was repaired and HECU memory was not cleared.
Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination,

	deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Terminal and Connector Inspection" procedure.

Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Power Circuit Inspection" procedure.

Power Circuit Inspection

■ Open or Short Check

1. Ignition "ON" & Engine "OFF".
2. Measure voltage between power terminal of the wheel speed sensor harness connector and chassis ground.

Specification : Approx. B+

3. Is the measured value within specifications?

YES	► Go to "Signal Circuit Inspection" procedure.
NO	► Repair open or short in power circuit between HECU harness connector and wheel speed sensor harness connector and then go to "Verification of vehicle Repair" procedure. If there is no problem in Power circuit, Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.

Signal Circuit Inspection

■ Wheel speed sensor circuit check

1. Lift the vehicle.
2. Ignition "ON" & Engine "OFF".
3. Turn the wheel by hand.
4. Measure waveform between signal terminal of the wheel speed sensor harness connector and chassis ground with oscilloscope.

Specification : High : 1.18~1.68V , Low : 0.59~0.84V

5. Is the measured waveform within specifications?

YES	► Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.
NO	► Repair open or short in signal circuit between HECU harness connector and wheel speed sensor harness connector, and then go to "Verification of vehicle Repair" procedure. If there is no problem in signal circuit, go to "Component Inspection" procedure.

Component Inspection

■ Wheel speed sensor circuit check

1. Lift the vehicle.
2. Ignition "ON" & Engine "OFF".
3. Turn the wheel by hand.
4. Measure waveform between signal terminal of the wheel speed sensor harness connector and chassis ground.

Specification : High : 1.18~1.68V , Low : 0.59~0.84V

5. Is the measured waveform within specifications?

YES	► Fault is intermittent caused by poor connection in wheel speed sensor harness (RR). Go to "Verification of Vehicle Repair" procedure.
NO	► Substitute with a known-good Wheel speed sensor and check for proper operation. If problem is corrected, replace Wheel speed sensor and then go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information. (Start and drive vehicle in gear and maintain vehicle speed at or above 10kmh. (6.2mph))
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

General Description

The wheel speed sensor is the essential component the ABS ECU uses to calculate vehicle speed and to determine whether wheel lock occurs.

For example, rear wheel speed signal is used as a reference value, for vehicle speed, in front wheel drive vehicles, and if a difference between front and rear wheel speed occurs, then ABS control is performed.

Wheel speed sensor is active hall-sensor type.

DTC Description

The ABS ECU monitors the wheel speed sensor signal continuously.

This code is set if an abnormal speed change ratio is detected while the vehicle speed is more than 2Km/h.

Warning lamp is turned OFF unless additional faults are detected when the IG KEY is turned ON again, and wheel speed is more than 10 Km/h.

DTC Detecting Condition

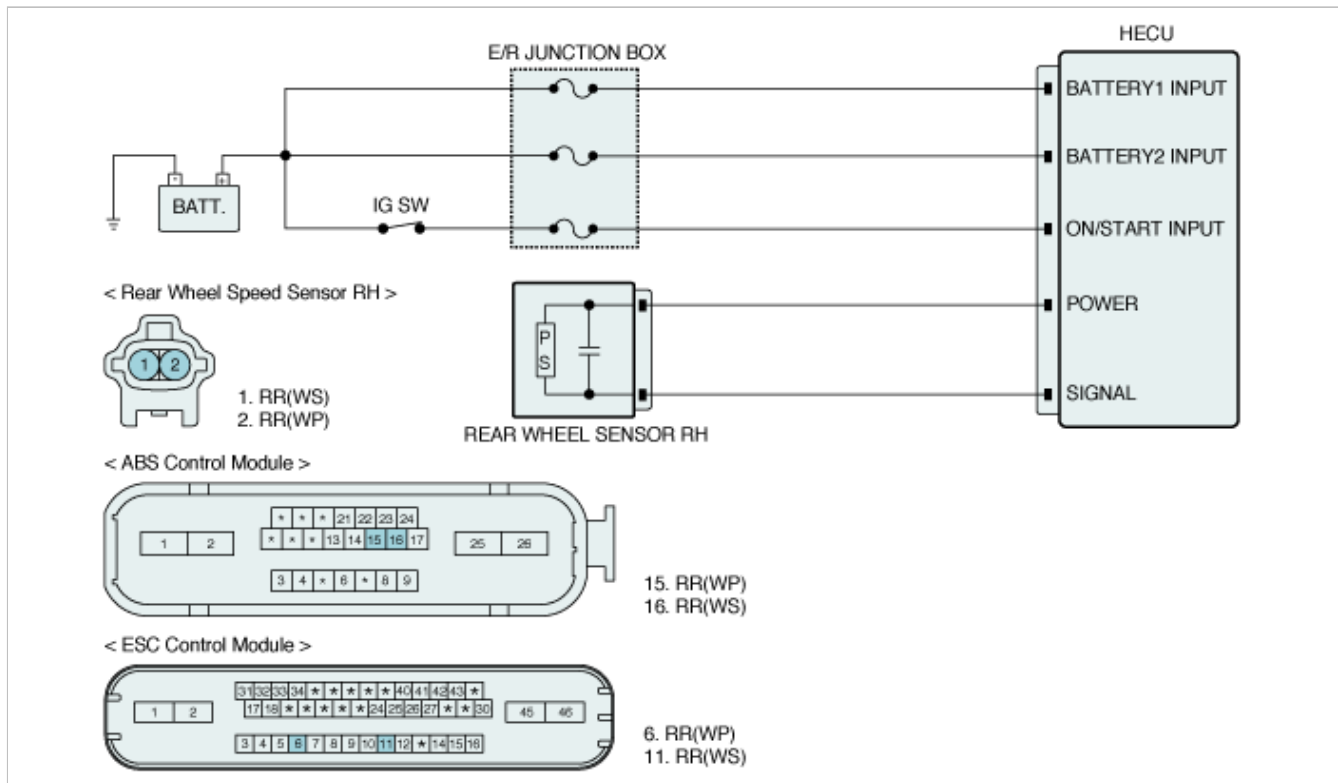
Item		Detecting Condition	Possible cause
DTC Strategy		<ul style="list-style-type: none"> Signal monitoring 	<ul style="list-style-type: none"> Improper installation of wheel speed sensor Abnormal Rotor and wheel bearing Faulty Wheel speed sensor
Enable Conditions	Case1	<ul style="list-style-type: none"> 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. 	
	Case2	<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 70g[(17.5km/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 70g at each wheel exceed 20 times, controller recognize the failure. <ul style="list-style-type: none"> The counter of speed jump is cleared every 30min. This monitoring is performed for the period that the velocity of each wheel exceeds 2km/h. 	
	Fail Safe	<ol style="list-style-type: none"> Only one wheel failure : Inhibit the ABS/ESC control, allow the EBD control. The ABS/ESC warning lamps are activated, the EBD warning lamp is not activated. More than two wheels failure : The ABS/EBD/ESC 	

functions are inhibited. The ABS/EBD/ESC warning lamps are activated.

Specification

Sensor Type	Output Voltage		Airgap
	HIGH	LOW	
Active Type	1.18~1.68V	0.59~0.84V	0.4~1.5mm

Diagnostic Circuit Diagram



Signal Waveform & Data

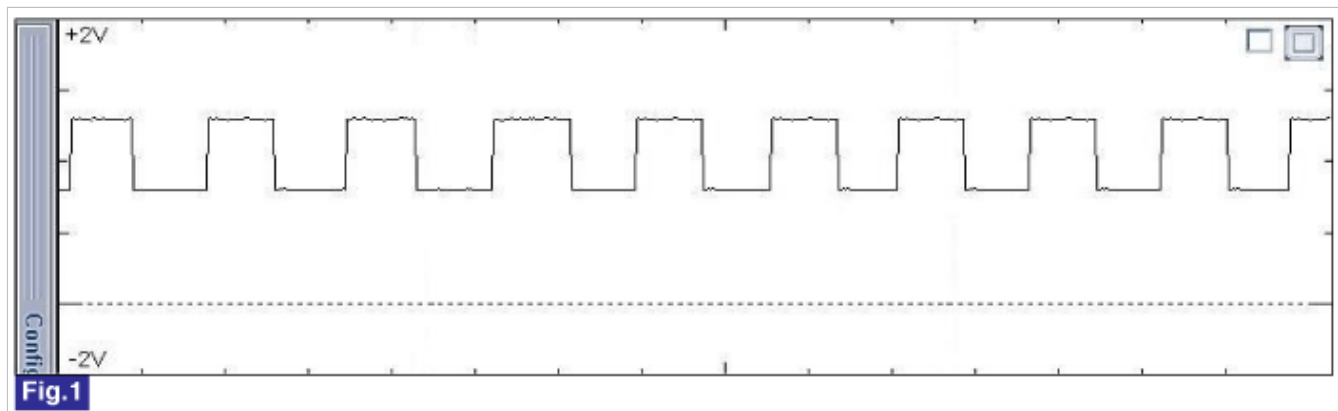


Fig 1) Normal waveform of wheel speed sensor (Active type)
- High : Approx. 1.4V, Low : Approx. 0.7V

Monitor Scantool Data

1. Ignition "ON" & Engine "ON".
2. Connect scantool to Data Link Connector(DLC)

3. Start and drive vehicle in gear and maintain vehicle speed at or above 40km/h. (24mph)
4. Monitor the "WHEEL SPEED(RR)" parameter on the Scantool.

Specification :

Compare with other parameters related to wheel speed sensor.
If it is the same as other parameters, it is in normal condition.

5. Is parameter displayed within specifications?

YES	<p>► Fault is intermittent caused by poor connection in wheel speed sensor harness (RR) and/or HECU's connector or was repaired and HECU memory was not cleared.</p> <p>Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.</p> <p>Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.</p>
NO	<p>► Go to "Component Inspection" Procedure.</p>

Component Inspection

■ Wheel speed sensor circuit check

1. Lift the vehicle.
2. Ignition "ON" & Engine "OFF".
3. Turn the wheel by hand.
4. Measure waveform between signal terminal of the wheel speed sensor harness connector and chassis ground with oscilloscope.

Specification : High : 1.18~1.68V , Low : 0.59~0.84V

5. Is the measured waveform within specifications?

YES	<p>► Fault is intermittent caused by faulty HECU, wheel speed sensor or external noise, an interference between harnesses, was repaired and HECU memory was not cleared.</p> <p>Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.</p> <p>Repair as necessary and then go to "Verification of Vehicle Repair" procedure.</p> <p>If there is no problem in signal circuit, Substitute with a known-good HECU and check for proper operation.</p> <p>If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.</p>
NO	<p>► Check for improper installation of wheel speed sensor. If NG, repair as necessary and then go to "Verification of vehicle Repair" procedure.</p> <p>Check for damage of rotor teeth or wheel bearing. If NG, repair as necessary and then go to "Verification of vehicle Repair" procedure.</p> <p>Substitute with a known-good Wheel speed sensor and check for proper operation.</p> <p>If problem is corrected, replace Wheel speed sensor and then go to "Verification of Vehicle Repair" procedure.</p>

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information. (Start and drive vehicle in gear and maintain vehicle speed at or above 40kmh. (24mph))
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1211 Wheel Speed Sensor Rear-RH Invalid/no Signal**

General Description

The wheel speed sensor is the essential component the ABS ECU uses to calculate vehicle speed and to determine whether wheel lock occurs.

For example, rear wheel speed signal is used as a reference value, for vehicle speed, in front wheel drive vehicles, and if a difference between front and rear wheel speed occurs, then ABS control is performed.

Wheel speed sensor is active hall-sensor type.

DTC Description

The ABS ECU monitors the wheel speed sensor signal continuously.

This code is set when the sensor air gap is out of specified range or when the ABS control cycle is continued abnormally.

The HECU checks for air gap malfunctioning by monitoring the sensor signal at speeds between 2Km/h to 10 Km/h.

Warning lamp is turned OFF unless additional faults are detected when the IG KEY is turned ON again, and wheel speed is more than 10 Km/h (6.2mph).

DTC Detecting Condition

Item		Detecting Condition	Possible cause
DTC Strategy		• Signal monitoring	<ul style="list-style-type: none"> • Improper installation of wheel speed sensor • Abnormal Rotor and wheel bearing • Faulty Wheel speed sensor
Case1 (Large Air-Gap)	Enable Conditions	<ul style="list-style-type: none"> • When the minimum wheel velocity is 2km/h and the velocity of other wheels exceed 10km/h (6.2mph) with the acceleration of < 0.4g, the controller start comparing the velocity of other wheels except the min. wheel. if their difference below 4km/h (2.5mph) is continued for 140msec, Otherwise, if their difference beyond 4km/h (2.5mph) or >0.4g is continued for 2 minutes. • In < 0.4g, when the velocity of more two wheels is 2km/h (1.2mph) and the max. wheel velocity exceeds 10km/h (6.2mph), the condition is continued for 20 sec. Otherwise, In >0.4g, the condition is 2 minutes. • After velocity of 4 wheel exceeds 10km/h (6.2mph), when velocity of 1 wheel or 2 wheel is 2km/h (1.2mph) and difference of other 2 wheel velocity is less than 4km/h (2.5mph) under that those velocity is more than 10km/h (6.2mph), if that conditions are continued for 12 seconds. - This monitoring is performed for the period that the minimum velocity rises from 2km/h (1.2mph) to 10km/h (6.2mph). 	
Case2 (long term ABS mode)	Enable Conditions	<ul style="list-style-type: none"> • During the ABS control cycle, if the wheel velocity of 2km/h (1.2mph) is lasted for more than 12sec. • If the ABS control cycle is continued for more than 36 sec. 	
Fail Safe		<ol style="list-style-type: none"> 1. Only one wheel failure : Inhibit the ABS/ESC control, allow the EBD control. The ABS/ESC warning lamps are activated, the EBD warning lamp is not activated. 2. More than two wheels failure : The ABS/EBD/ESC functions are inhibited. The ABS/EBD/ESC warning lamps are activated. 	

Specification

Sensor Type	Output Voltage		Airgap
	HIGH	LOW	

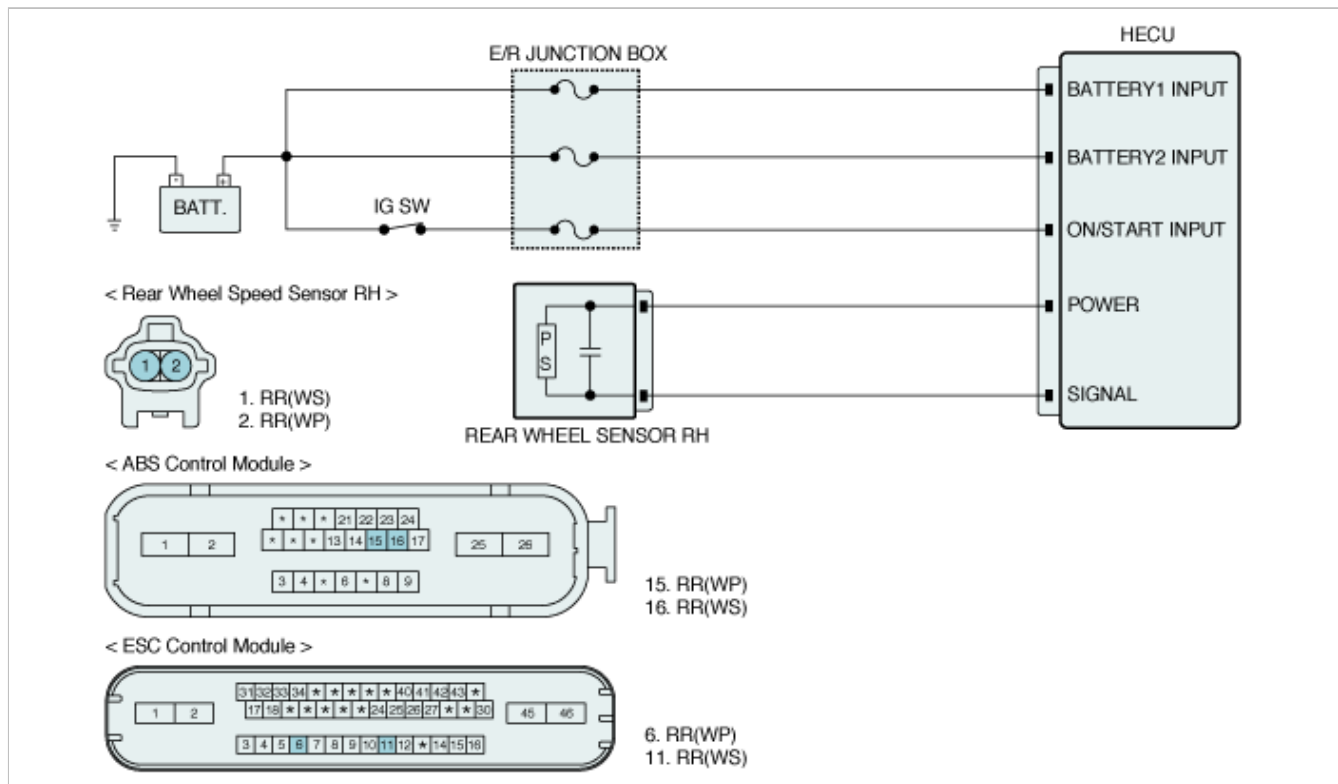
Active Type

1.18~1.68V

0.59~0.84V

0.4~1.5mm

Diagnostic Circuit Diagram



Signal Waveform & Data

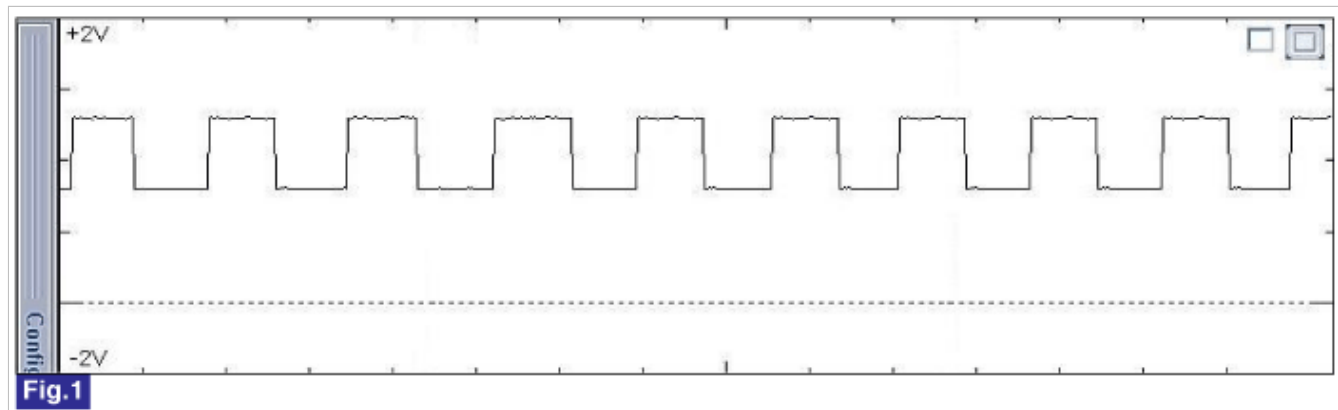


Fig 1) Normal waveform of wheel speed sensor (Active type)

- High : Approx. 1.4V,
- Low : Approx. 0.7V 0.59~0.84V

Monitor Scantool Data

1. Ignition "ON" & Engine "ON".
2. Connect scantool to Data Link Connector(DLC)
3. Start and drive vehicle in gear and maintain vehicle speed at or above 10km/h. (6.2mph)
4. Monitor the "WHEEL SPEED(RR)" parameter on the Scantool.

Specification :

Compare with other parameters related to wheel speed sensor.
If it is the same as other parameters, it is in normal condition.

5. Is parameter displayed within specifications?

YES	► Fault is intermittent caused by poor connection in wheel speed sensor harness (RR) and/or HECU's connector or was repaired and HECU memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Component Inspection" Procedure.

Component Inspection

■ Wheel speed sensor circuit check

1. Lift the vehicle.
2. Ignition "ON" & Engine "OFF".
3. Turn the wheel by hand.
4. Measure waveform between signal terminal of the wheel speed sensor harness connector and chassis ground with oscilloscope.

Specification : High : 1.18~1.68V , Low : 0.59~0.84V

5. Is the measured waveform within specifications?

YES	► Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.
NO	► Check for improper installation of wheel speed sensor. If NG, repair as necessary and then go to "Verification of vehicle Repair" procedure. Check for damage of rotor teeth or wheel bearing. If NG, repair as necessary and then go to "Verification of vehicle Repair" procedure. Substitute with a known-good Wheel speed sensor and check for proper operation. If problem is corrected, replace Wheel speed sensor and then go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information. (Start and drive vehicle in gear and maintain vehicle speed at or above 10kmh. (6.2mph))
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

General Description

The pressure sensor, installed in the HECU, sense the brake oil pressure to judge driver's brake intention when ESC is operating.

If pressure of master cylinder is applied to pressure sensor, the strain of the piezo element is changed and then the resistance of brige circuit is chanded according to changed strain.

Therefore this changed resistance changes output voltage of brige circuit and output voltage changes linearly.

The sensor output is a analog signal in proportion to supply voltage, and the HECU recognizes a pressure value according to signal ratio about supply voltage.

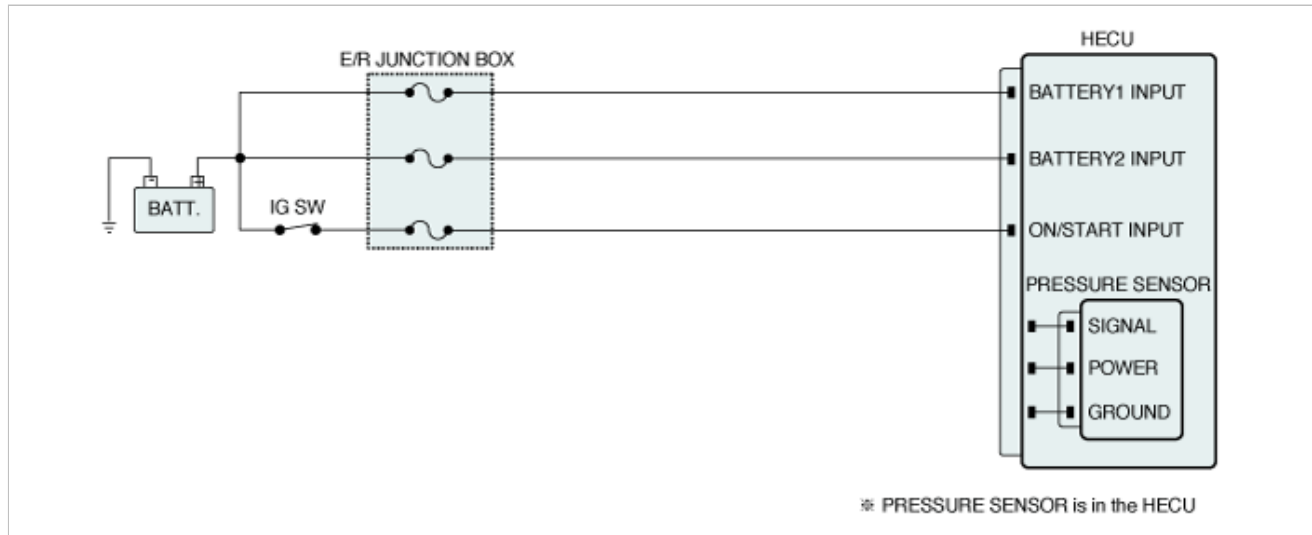
DTC Description

A failure is detected if the output signal voltage of the pressure sensor is out of specified range.

DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	• Voltage Monitoring	<ul style="list-style-type: none"> • Open or short of pressure sensor circuit • Faulty pressure sensor
Enable Conditions	<ul style="list-style-type: none"> • The output signal voltage of the pressure sensor is out of the specified range. - The monitoring starts 1sec after power up. 	
Fail Safe	<ul style="list-style-type: none"> • Inhibit the ESC control and allow the ABS/EBD control. • The ESC warning lamp is activated. 	

Diagnostic Circuit Diagram



Monitor Scantool Data

1. Connect scantool to Data Link Connector(DLC).
2. Ignition "ON" & Engine "ON".
3. Press the brake pedal.
4. Monitor the "PRESSURE SENSOR" parameter on the Scantool.

Specification :

Approx. 60bar ~150bar (There is difference in displayed parameter according to braking force)

Sensor Name	Value	Ref. Min	Ref. Max	Unit	Test Condition
<input checked="" type="checkbox"/> Pressure Sensor - Positive	0.0			bar	-
<input checked="" type="checkbox"/> Pressure Sensor - Negative	0.0			bar	-

Fig.1

Sensor Name	Value	Ref. Min	Ref. Max	Unit	Test Condition
<input checked="" type="checkbox"/> Pressure Sensor - Positive	100.0			bar	-
<input checked="" type="checkbox"/> Pressure Sensor - Negative	100.0			bar	-

Fig.2

Fig 1) Normal data at not pressing the brake pedal

Fig 2) Normal data at pressing the brake pedal

(The pressure value can be different based on braking force)

5. Whenever brake pedal is pushed down, is the pressure sensor's scantool data changed?

YES	► Fault is caused by having been repaired and HECU memory was not cleared. Clear the DTC and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Component Inspection" procedure.

Component Inspection

1. Ignition "OFF".
2. Ignition "ON" & Engine "OFF".
3. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
4. Using a scantool, Clear DTC.
5. Select "Diagnostic Trouble Codes(DTCs)" mode again.
6. Are any DTCs present ?

YES	► Substitute with a known-good pressure sensor and check for proper operation. If problem is corrected, replace pressure sensor and then go to "Verification of Vehicle Repair" procedure.
NO	► This fault may be intermittently caused. Go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information.
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

General Description

The pressure sensor, installed in the HECU, sense the brake oil pressure to judge driver's brake intention when ESC is operating.

If pressure of master cylinder is applied to pressure sensor, the strain of the piezo element is changed and then the resistance of brige circuit is chanded according to changed strain.

Therefore this changed resistance changes output voltage of brige circuit and output voltage changes linearly.

The sensor output is a analog signal in proportion to supply voltage, and the HECU recognizes a pressure value according to signal ratio about supply voltage.

DTC Description

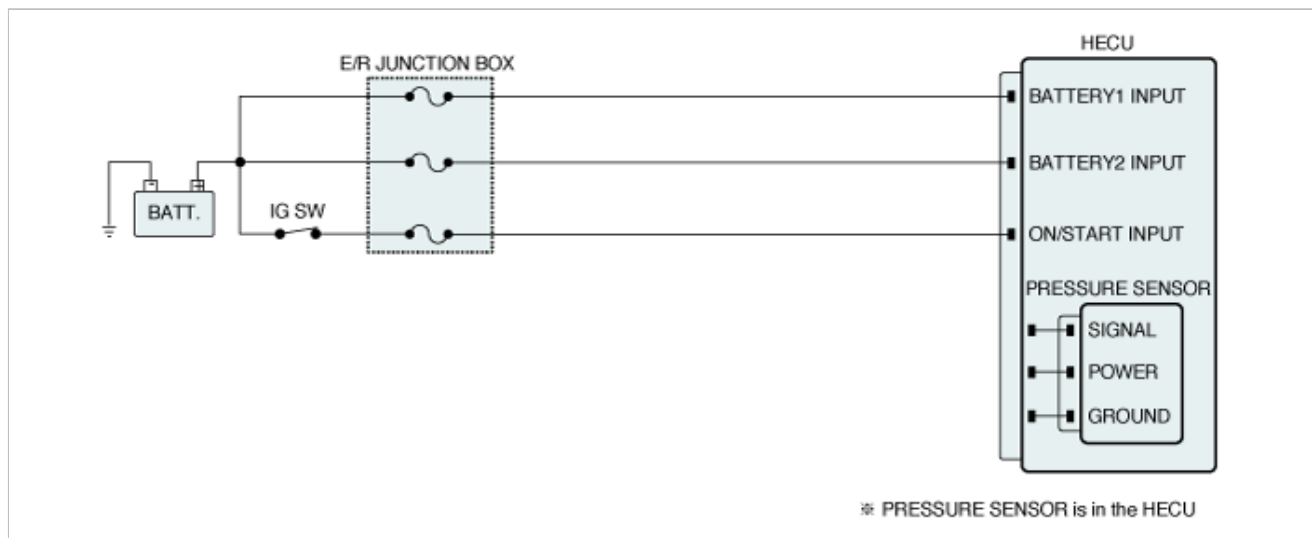
The failure is detected if the pressure sensor signal noise is out of normal range, or the pressure sensor signal is changed abnormally.

In spite of no brake switch signal, master cylinder pressure exceeds 20bar when brake switch is normal.

DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	• Voltage Monitoring	<ul style="list-style-type: none"> • External noise. • Faulty pressure sensor
Enable Conditions	<ul style="list-style-type: none"> • If input signal is noisy, Which the gradient of the sensor signal is larger than predefined value for specific times, ECU detect the failure. • Outside an ABS/ESC control, And after normal operation of BLS, If the pressure sensor signal is higher than 20bar and BLS is low for 3sec, ECU detect the failure. 	
Fail Safe	<ul style="list-style-type: none"> • Inhibit the ESC control and allow the ABS/EBD control. • The ESC warning lamp is activated. 	

Diagnostic Circuit Diagram



Monitor Scantool Data

1. Connect scantool to Data Link Connector(DLC).
2. Ignition "ON" & Engine "ON".
3. Press the brake pedal.
4. Monitor the "PRESSURE SENSOR" parameter on the Scantool.

Specification :

Approx. 60bar ~150bar (There is difference in displayed parameter according to braking force)

Sensor Name	Value	Ref. Min	Ref. Max	Unit	Test Condition
<input checked="" type="checkbox"/> Pressure Sensor - Positive	0.0			bar	-
<input checked="" type="checkbox"/> Pressure Sensor - Negative	0.0			bar	-

Fig.1

Sensor Name	Value	Ref. Min	Ref. Max	Unit	Test Condition
<input checked="" type="checkbox"/> Pressure Sensor - Positive	100.0			bar	-
<input checked="" type="checkbox"/> Pressure Sensor - Negative	100.0			bar	-

Fig.2

Fig 1) Normal data at not pressing the brake pedal

Fig 2) Normal data at pressing the brake pedal

(The pressure value can be different based on braking force)

5. Whenever brake pedal is pushed down, is the pressure sensor's scantool data changed?

YES	► Fault is caused by having been repaired and HECU memory was not cleared. Clear the DTC and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Component Inspection" procedure.

Component Inspection

1. Ignition "OFF".
2. Ignition "ON" & Engine "OFF".
3. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
4. Using a scantool, Clear DTC.
5. Select "Diagnostic Trouble Codes(DTCs)" mode again.
6. Are any DTCs present ?

YES	► Substitute with a known-good pressure sensor and check for proper operation. If problem is corrected, replace pressure sensor and then go to "Verification of Vehicle Repair" procedure.
NO	► This fault may be intermittently caused. Go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information.
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1259 Steering Angle Sensor – Electrical Malfunction**

General Description

The Steering wheel angle sensor uses two sensors (A-sensor and B-sensor) to determine the direction of the rotation. The main components of each sensor are LED, photo transistor and slit plate.

The slit plate, which has 45 holes, is installed between LED and photo transistor, and generates signals if slit plate rotates according to the steering wheel rotation.

The sensor signals are generated by photo transistor which is driven whenever the light passes through the holes. The HECU detects operating speed and direction of the steering wheel by this input signal, and the signal is used to input signal for anti-roll control.

DTC Description

If some signal voltage stays in abnormal voltage range, the time is counted separately.

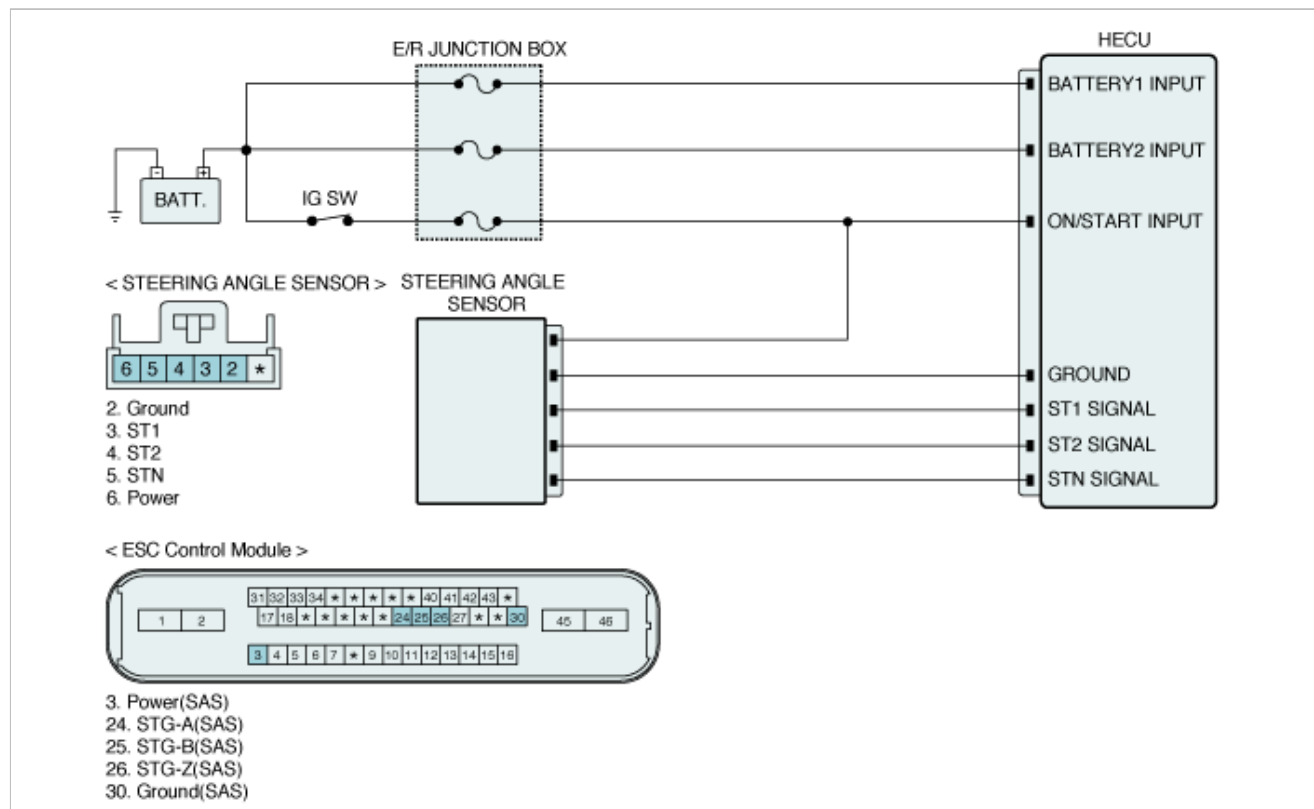
And if the monitored time exceeds the specified min. fault duration, failure is detected.

The monitoring starts 1sec after Power Up.

DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	• Voltage Monitoring	<ul style="list-style-type: none"> • Open or short of steering wheel sensor circuit • Faulty steering wheel sensor
Enable Conditions	<ul style="list-style-type: none"> • When $V_{sas} > 4.2 \pm 0.1V$ or $V_{sas} < 1.2 \pm 0.1V$ or $2.1 \pm 0.1V < V_{sas} < 2.9 \pm 0.1V$ continue 1sec. - The monitoring starts 1sec after Power Up. ※ V_{sas} : Voltage of the steering angle sensor. 	
Fail Safe	<ul style="list-style-type: none"> • Inhibit the ESC control and allow the ABS/EBD control. • The ESC warning lamp is activated. 	

Diagnostic Circuit Diagram



Signal Waveform & Data

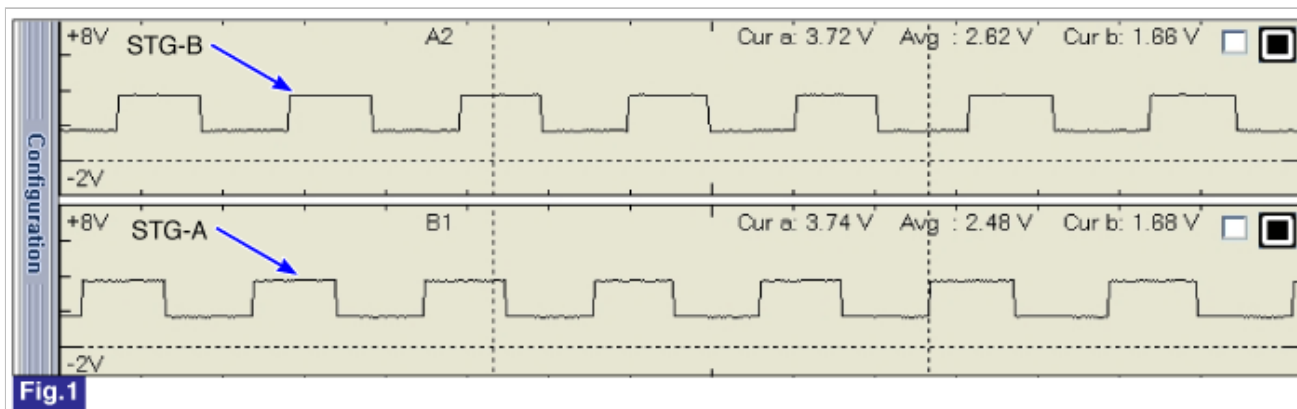


Fig.1

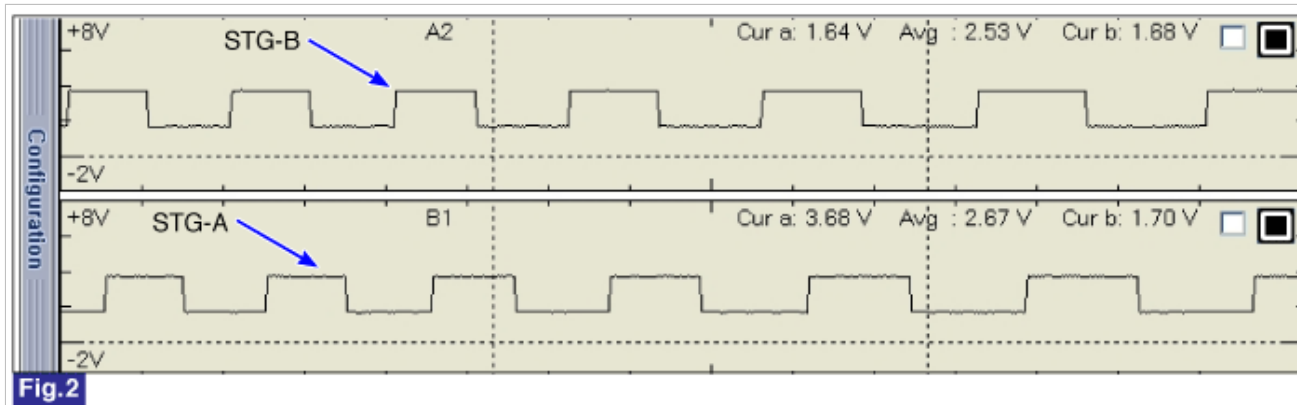


Fig.2

Fig 1) Normal waveform at turning the steering wheel into left

Fig 2) Normal waveform at turning the steering wheel into right

Monitor Scantool Data

1. Connect scantool to Data Link Connector(DLC).
2. Ignition "ON" & Engine "ON".
3. Turn the steering wheel to the left or right.
4. Monitor the "STEERING SNSR" parameters on the Scantool.

Specification :

If the parameters are changed according to wheel position during steering the wheel, it is normal condition.

Sensor Name	Value	Ref. Min	Ref. Max	Unit	Test Condition
<input checked="" type="checkbox"/> Steering Angle Sensor-1	HIGH			-	-
<input checked="" type="checkbox"/> Steering Angle Sensor-2	LOW			-	-
<input checked="" type="checkbox"/> Steering Angle Sensor-N	HIGH			-	-

Fig.1

Fig 1) Test Condition : Ignition "ON" & Engine "ON".

Normal Data

5. Whenever steering wheel is turned, is the steering sensor's scantool data changed?

YES	<p>► Fault is intermittent caused by poor connection in steering sensor harness and/or HECU's connector or was repaired and HECU memory was not cleared.</p> <p>Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.</p> <p>Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.</p>
NO	<p>► Go to "Terminal and Connector Inspection" procedure.</p>

Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Power Circuit Inspection" procedure.

Power Circuit Inspection

■ Open or Short Check

1. Ignition "ON" & Engine "OFF".
2. Measure voltage between power terminal of the steering angle sensor harness connector and chassis ground.

Specification : Approx. 12V

3. Is the measured value within specifications?

YES	► Go to "Ground Circuit Inspection" procedure.
NO	► Repair open or short in power circuit between steering angle sensor harness connector and HECU harness connector, and then go to "Verification of vehicle Repair" procedure. If there is no problem in Power circuit, Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.

Ground Circuit Inspection

■ Open or Short Check

1. Ignition "OFF" & Engine "OFF".
2. Disconnect steering angle sensor connector.
3. Measure resistance between ground terminal of the steering angle sensor harness connector and chassis ground.

Specification : Approx. below 1Ω

4. Is the measured value within specifications?

YES	► Go to "Signal Circuit Inspection" procedure.
NO	► Repair open or short in ground circuit between steering angle sensor harness connector and HECU harness connector and then, go to "Verification of vehicle Repair" procedure.

Signal Circuit Inspection

■ Open or Short Check

1. Ignition "ON" & Engine "OFF".
2. Measure resistance between signal terminals(STG-A/STG-B/STG-Z) of the HECU harness connector and signal terminals (STG-A/STG-B/STG-Z) of the steering angle sensor harness connector.

Specification : Approx. below 1Ω

3. Is the measured value within specifications?

	► Go to "Component Inspection" procedure.
--	---

YES	
NO	► Repair open in signal circuit between the steering angle sensor harness connector and HECU harness connector and then, go to "Verification of vehicle Repair" procedure.

Component Inspection

■ Steering Angel Sensor Check

1. Ignition "ON" & Engine "OFF".
2. Turn the steering wheel to the left or right.
3. Measure waveform between signal terminal of the steering angle sensor harness connector and chassis ground with oscilloscope.

Specification :

Check if the voltage of signal waveform is normal.

- HIGH : $2.9 \pm 0.1V \sim 4.4 \pm 0.1V$

- LOW : $1.2 \pm 0.1V \sim 2.1 \pm 0.1V$

Check if there is a center signal at around center point($\pm 20^\circ$).

4. Is the measured waveform normal?

YES	► Fault is intermittent caused by poor connection in steering sensor harness and/or HECU's connector. Go to "Verification of vehicle Repair" procedure.
NO	► If STN signal is HIGH on center position, Check for improper installation of steering angle sensor. Repair as necessary and then go to "Verification of vehicle Repair" procedure. If sensor mounting state is normal, Substitute with a known-good steering angle sensor and check for proper operation. If problem is corrected, replace steering angle sensor and then go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information.
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1260 Steering Angle Sensor Circuit-Signal**

General Description

The Steering wheel angle sensor uses two sensors (A-sensor and B-sensor) to determine the direction of the rotation.

The main components of each sensor are LED, photo transistor and slit plate.

The slit plate, which has 45 holes, is installed between LED and photo transistor, and generates signals if slit plate rotates according to the steering wheel rotation.

The sensor signals are generated by photo transistor which is driven whenever the light passes through the holes. The HECU detects operating speed and direction of the steering wheel by this input signal, and the signal is used to input signal for anti-roll control.

DTC Description

This monitoring function monitors the changing point of N-signal with measured steering angle from ST1 and ST2.

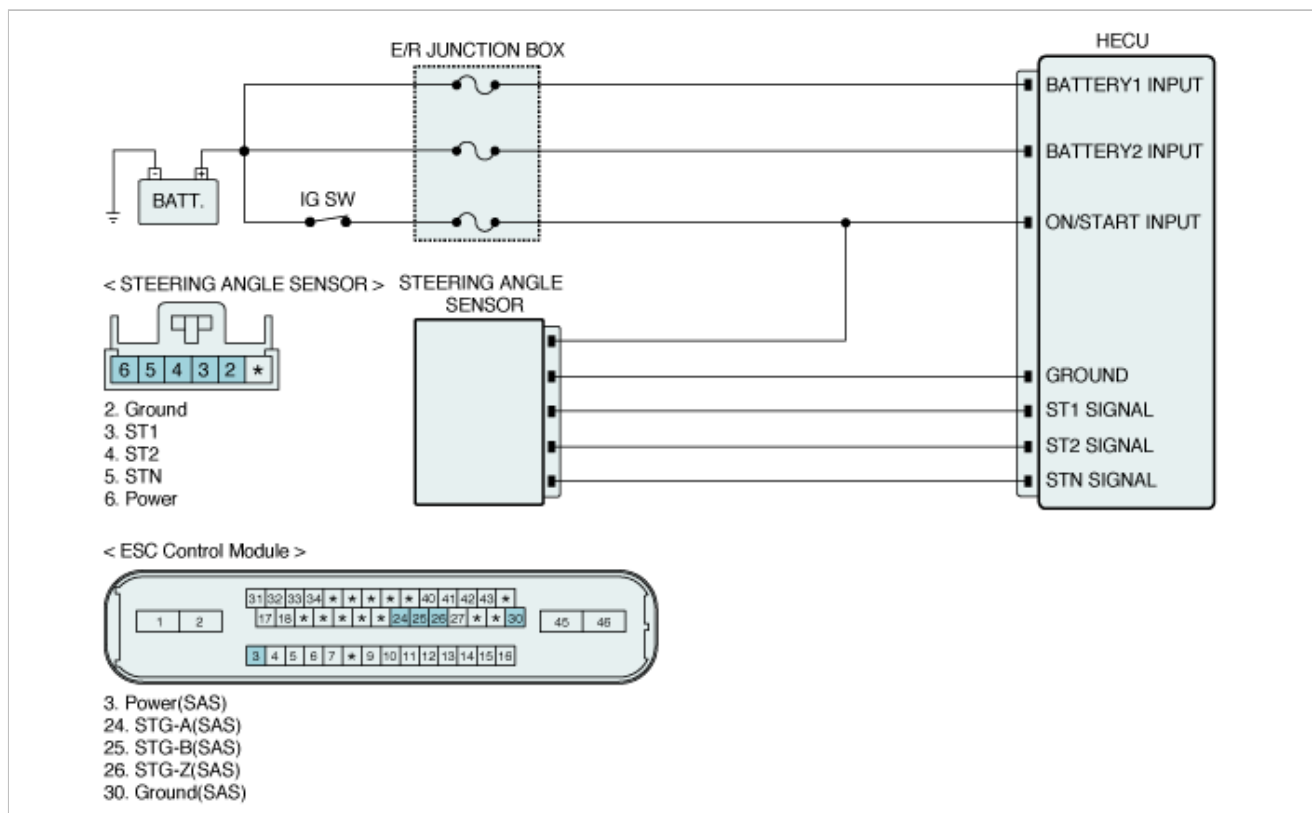
If N-signal changing point differs more than predefined degree, the failure is detected.

If there is no variation of the steering wheel angle for predefined time ECU detect the failure.

DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	<ul style="list-style-type: none">• Signal Monitoring	<ul style="list-style-type: none">• Faulty steering angle sensor• Incorrect installation of the sensor
Enable Conditions	<ul style="list-style-type: none">• The STN is low more than ± 10 degrees for 70msec.• When the steering wheel is turned more than 370 ± 5 degrees, if center is not detected, ECU detects the failure.• When the steering wheel angle is higher than 800 degrees, ECU detects the failure.• During straight driving, if the steering wheel angle is larger than 55 ± 5 degree, ECU detects the failure.• When the curve is detected after driving straight, if there is no variation of the steering wheel angle for 3 sec, ECU detect the failure.• While the vehicle drive 60 ± 5 degree \leftrightarrow -60 ± 5 degree, if STN is not detected low, ECU detect the failure.• While the steering wheel is turning through center point, if steering angle sensor is against specification more than three times, ECU detect the failure.	
Fail Safe	<ul style="list-style-type: none">• Inhibit the ESC control and allow the ABS/EBD control.• The ESC warning lamp is activated.	

Diagnostic Circuit Diagram



Signal Waveform & Data

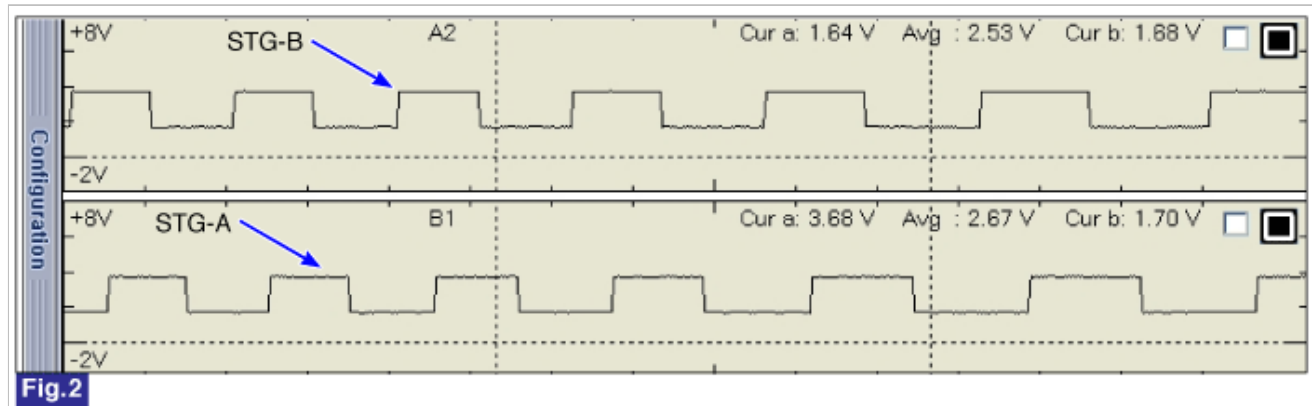
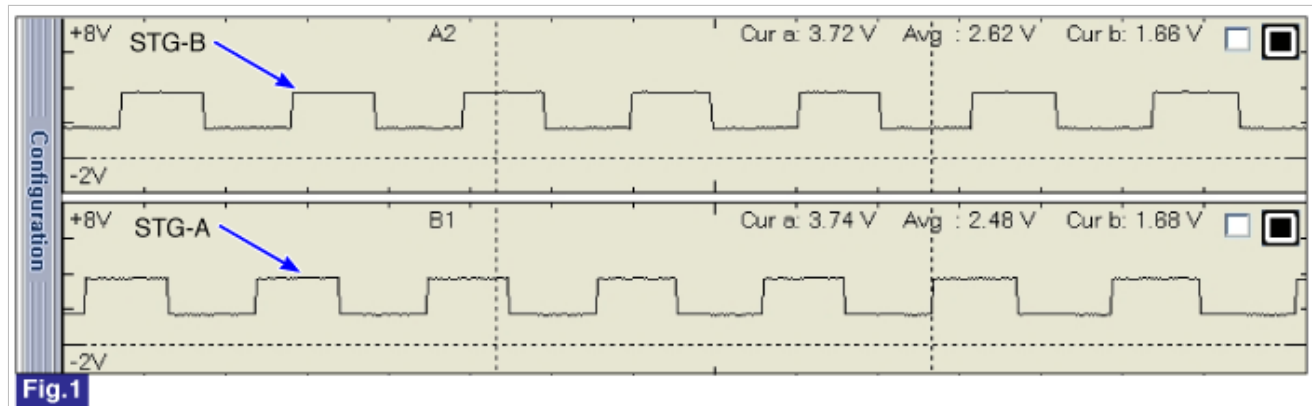


Fig 1) Normal waveform at turning the steering wheel into left
Fig 2) Normal waveform at turning the steering wheel into right

Monitor Scantool Data

1. Connect scantool to Data Link Connector(DLC).
2. Ignition "ON" & Engine "ON".

- Turn the steering wheel to the left or right.
- Monitor the "STEERING ANGLE SNSR" parameters on the Scantool.

Specification :

If the parameters are changed according to wheel position during steering the wheel, it is normal condition.

Sensor Name	Value	Ref. Min	Ref. Max	Unit	Test Condition
<input checked="" type="checkbox"/> Steering Angle Sensor-1	HIGH			-	-
<input checked="" type="checkbox"/> Steering Angle Sensor-2	LOW			-	-
<input checked="" type="checkbox"/> Steering Angle Sensor-N	HIGH			-	-

Fig.1

Fig 1) Test Condition : Ignition "ON" & Engine "ON".

Normal Data

- Whenever steering wheel is turned, is the steering sensor's scantool data changed?

YES	<p>► Fault is intermittent caused by poor connection in steering sensor harness and/or HECU's connector or was repaired and HECU memory was not cleared.</p> <p>Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.</p> <p>Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.</p>
NO	<p>► Go to "Terminal and Connector Inspection" procedure.</p>

Terminal and Connector Inspection

- Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
- Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
- Has a problem been found?

YES	<p>► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.</p>
NO	<p>► Go to "Component Inspection" procedure.</p>

Component Inspection

■ Steering Angel Sensor Check

- Ignition "ON" & Engine "ON".
- Turn the steering wheel to the left or right.
- Measure waveform between signal terminal of the steering angle sensor harness connector and chassis ground with oscilloscope.

Specification :

Check if the voltage of signal waveform is normal.

- HIGH : $2.9 \pm 0.1V \sim 4.4 \pm 0.1V$

- LOW : $1.2 \pm 0.1V \sim 2.1 \pm 0.1V$

Check if there is a center signal at around center point($\pm 20^\circ$).

- Is the measured waveform normal?

YES	<p>► Fault is intermittent caused by poor connection in steering sensor harness and/or HECU's connector. Go to "Verification of vehicle Repair" procedure.</p>
NO	<p>► If STN signal is HIGH on center position, Check for improper installation of steering angle sensor. Repair as necessary and then go to "Verification of vehicle Repair" procedure.</p> <p>If sensor mounting state is normal, Substitute with a known-good steering angle sensor and check for</p>

proper operation.

If problem is corrected, replace steering angle sensor and then go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information.
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1282 Yaw Rate & Lateral G Sensor-Electrical**

General Description

When the vehicle is turning with respect to a vertical axis, the yaw rate sensor detects the yaw rate electronically by the vibration change of plate fork inside the yaw rate sensor.

If yaw velocity reaches the specific velocity after it detects the vehicle's yawing, the ESC control is reactivated.

The lateral G sensor senses vehicle's lateral G. A small element inside the sensor is attached to a deflectable lever arm by lateral G.

Direction and magnitude of lateral G loaded to vehicle can be known with electrostatic capacity changing according to lateral G.

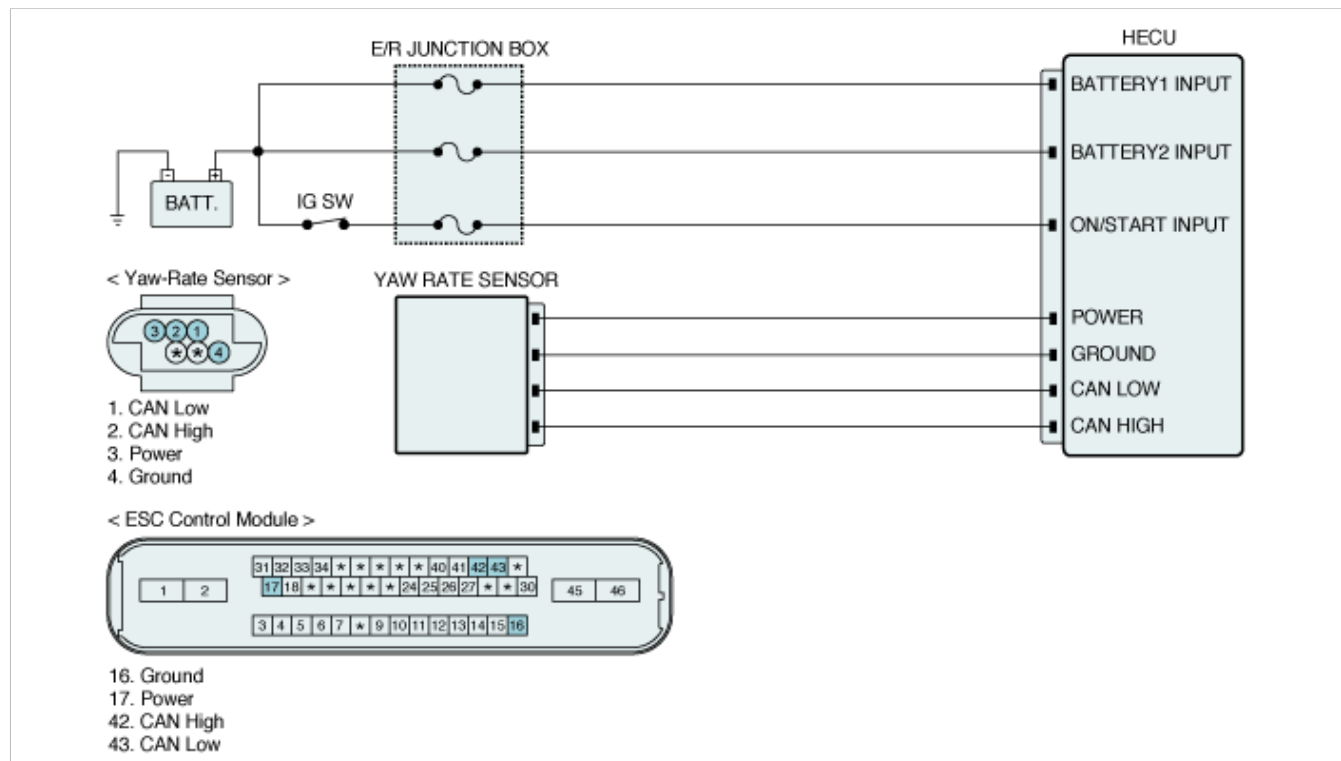
DTC Description

A failure is detected if the yaw rate & lateral G sensor's message was not received or HECU detects CAN Bus off state for more than the specified failure detection time.

DTC Detecting Condition

Item		Detecting Condition	Possible cause
Case1	DTC Strategy	• Yaw rate & lateral G sensor message monitoring	<ul style="list-style-type: none"> • Faulty Yaw Rate & Lateral G sensor • Open or short of Yaw Rate & Lateral G sensor
	Enable Conditions	<ul style="list-style-type: none"> • In case that Yaw rate & lateral G sensor message was not received for more than 500ms within normal voltage condition. - The Monitoring starts 1s after Power Up. 	
Case2	DTC Strategy	• Open, short monitoring	
	Enable Conditions	• In case sensor CAN BUS off state continued for more than 100ms.	
Fail Safe		<ul style="list-style-type: none"> • Inhibit the ESC control and allow the ABS/EBD control. • The ESC warning lamp is activated. 	

Diagnostic Circuit Diagram



Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Power Circuit Inspection" procedure.

Power Circuit Inspection

■ Open or Short Check

1. Ignition "ON" & Engine "OFF".
2. Measure voltage between power terminal of the Yaw Rate & Lateral G sensor harness connector and chassis ground.

Specification : Approx. 12V

3. Is the measured value within specifications?

YES	► Go to "Ground Circuit Inspection" procedure.
NO	► Repair open or short in power circuit between the yaw rate & lateral G sensor harness connector and HECU harness connector and then, go to "Verification of vehicle Repair"

Ground Circuit Inspection

■ Open or Short Check

1. Ignition "OFF" & Engine "OFF".
2. Disconnect yaw rate & lateral G sensor connector.
3. Measure resistance between ground terminal of the yaw rate & lateral G sensor harness connector and chassis ground.

Specification : Approx. below 1Ω

4. Is the measured value within specifications?

YES	► Go to "Signal Circuit Inspection" procedure.
NO	► Repair open or short in ground circuit between the yaw rate & lateral G sensor harness connector and HECU harness connector and then, go to "Verification of vehicle Repair"

Signal Circuit Inspection

■ Short Check (to ground)

1. Ignition "OFF" & Engine "OFF".
2. Disconnect yaw rate & lateral G sensor, HECU connector.
3. Measure resistance between CAN LOW terminal (CAN HIGH terminal) of the yaw rate & lateral G sensor harness connector and chassis ground.

Specification : ∞ Ω

4. Is the measured value within specifications?

--	--

YES	► Go to next procedure.
NO	► Repair short to ground in CAN signal circuit in case of abnormal resistance measured and then go to "Verification of vehicle Repair" procedure.

■ Short Check (to battery)

1. Ignition "ON" & Engine "OFF".
2. Disconnect HECU connector.
3. Measure voltage between CAN LOW terminal (CAN HIGH terminal) of the HECU harness connector and chassis ground.

Specification : Approx. 0 V

4. Is the measured value within specifications?

YES	► Go to "Component Inspection" procedure.
NO	► Repair short to battery in CAN signal circuit in case of abnormal voltage measured and then, go to "Verification of vehicle Repair" procedure.

Component Inspection

1. IG "OFF"
2. IG "ON"
3. After connecting scantool, check DTC on the scantool.
4. Using scantool, Erase the DTCs.
5. Using a scantool, Check DTC present.
6. Is the same DTC shown?

YES	► Substitute with a known-good yaw-rate & Lateral G sensor and check for proper operation. If problem is corrected, replace yaw-rate & Lateral G sensor and then go to "Verification of Vehicle Repair" procedure.
NO	► This fault is intermittently caused by the sensor. Go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information.
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1283 Yaw Rate & Lateral G Sensor-Signal**

General Description

When the vehicle is turning with respect to a vertical axis, the yaw rate sensor detects the yaw rate electronically by the vibration change of plate fork inside the yaw rate sensor.

If yaw velocity reaches the specific velocity after it detects the vehicle's yawing, the ESC control is reactivated.

The lateral G sensor senses vehicle's lateral G. A small element inside the sensor is attached to a deflectable lever arm by lateral G.

Direction and magnitude of lateral G loaded to vehicle can be known with electrostatic capacity changing according to lateral G.

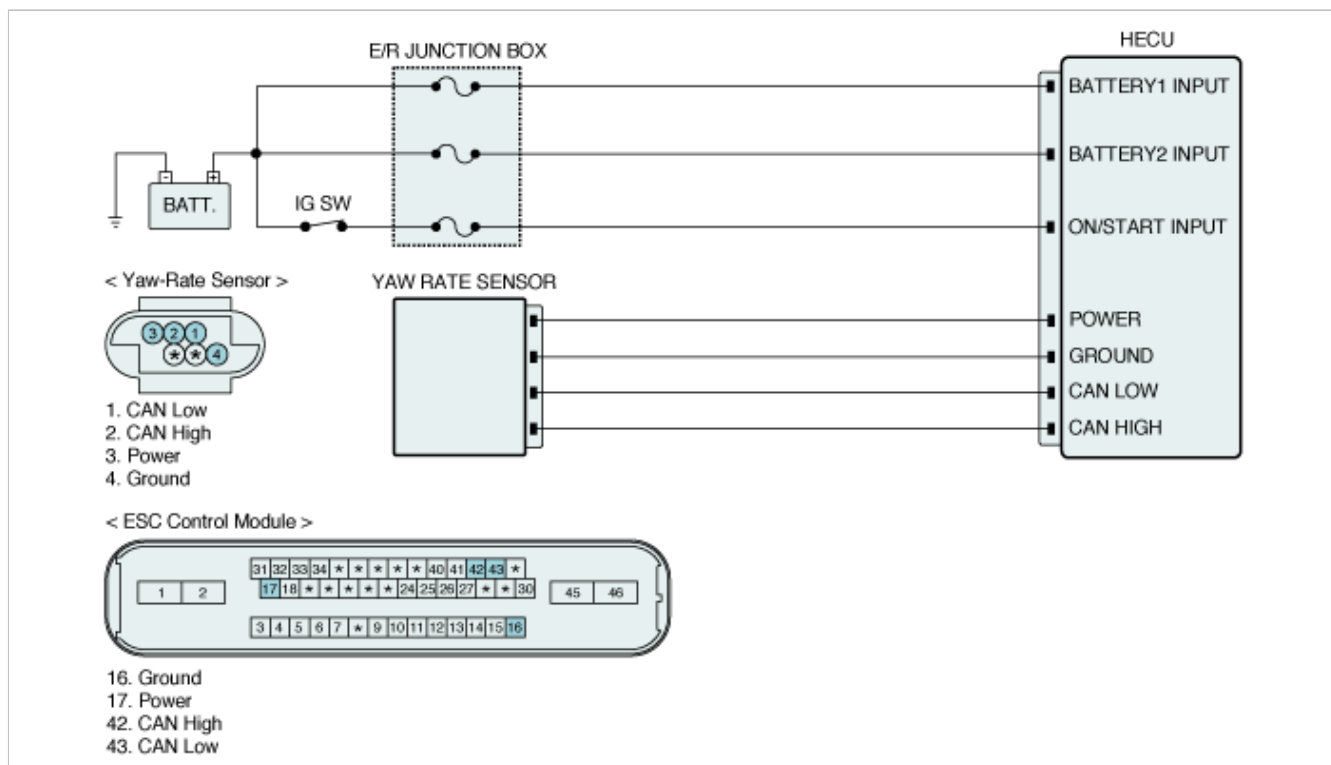
DTC Description

If the difference between estimated value and measured value of the sensor is larger than predefined value for predefined time, the failure is recognized.

DTC Detecting Condition

Item		Detecting Condition	Possible cause
DTC Strategy		• Signal monitoring	• Faulty Yaw Rate & Lateral G sensor
Case1	Enable Conditions	• When the difference between estimated value and measured value of the yaw rate sensor is larger than Predefined value for specific time, ECU detects failure.	
Case2	Enable Conditions	• When the difference between estimated value and measured value of the lateral G sensor is larger than Predefined value for specific time, ECU detects failure.	
Case3	Enable Conditions	• Yaw signal is smaller than predefined value when CBIT is transmitted • Lateral G signal is smaller than defined value when CBIT is transmitted. ※ CBIT :Commanded Built In Test	
Case4	Enable Conditions	• In case that Yaw&LG Sensor Fail Flag is detected for defined time.	
Fail Safe		• Inhibit the ESC control and allow the ABS/EBD control. • The ESC warning lamp is activated.	

Diagnostic Circuit Diagram



Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Component Inspection" procedure.

Component Inspection

1. Ignition "OFF".
2. Ignition "ON" & Engine "OFF".
3. Drive the vehicle within DTC Detecting Condition in General Information, including the left turn one time and the right turn one time.
4. Using a scantool, Clear DTC.
5. Select "Diagnostic Trouble Codes(DTCs)" mode again.
6. Are any DTCs present ?

YES	<p>► 1) Substitute with a known-good Yaw Rate & Lateral G sensor and check for proper operation. If problem is corrected, replace Yaw Rate & Lateral G sensor and then go to "Verification of Vehicle Repair" procedure.</p> <p>2) Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.</p>
NO	► Fault is intermittent caused by faulty Yaw Rate & Lateral G sensor or poor connection in Yaw Rate & Lateral G sensor harness and/or HECU's connector. Go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information. (Start and drive vehicle in gear and maintain vehicle speed at or above 40kmh. (24mph))
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1503 TCS/ESC(ESP) Switch error**

General Description

Driver can inhibit the ESC control by ESC switch.

When switch signal send into HECU, ESC warning lamp go ON and ESC control is stopped and if next switch signal is inputted again, ESC control is ready. This function is used for sporty driving or vehicle inspection.

DTC Description

Trouble code is set when the condition that the level of ESC switch is high is continued for 0sec.

When the ESC switch failure is set, Warning lamps wont illuminate and HECU allow the ABS/EBD/ESC control.

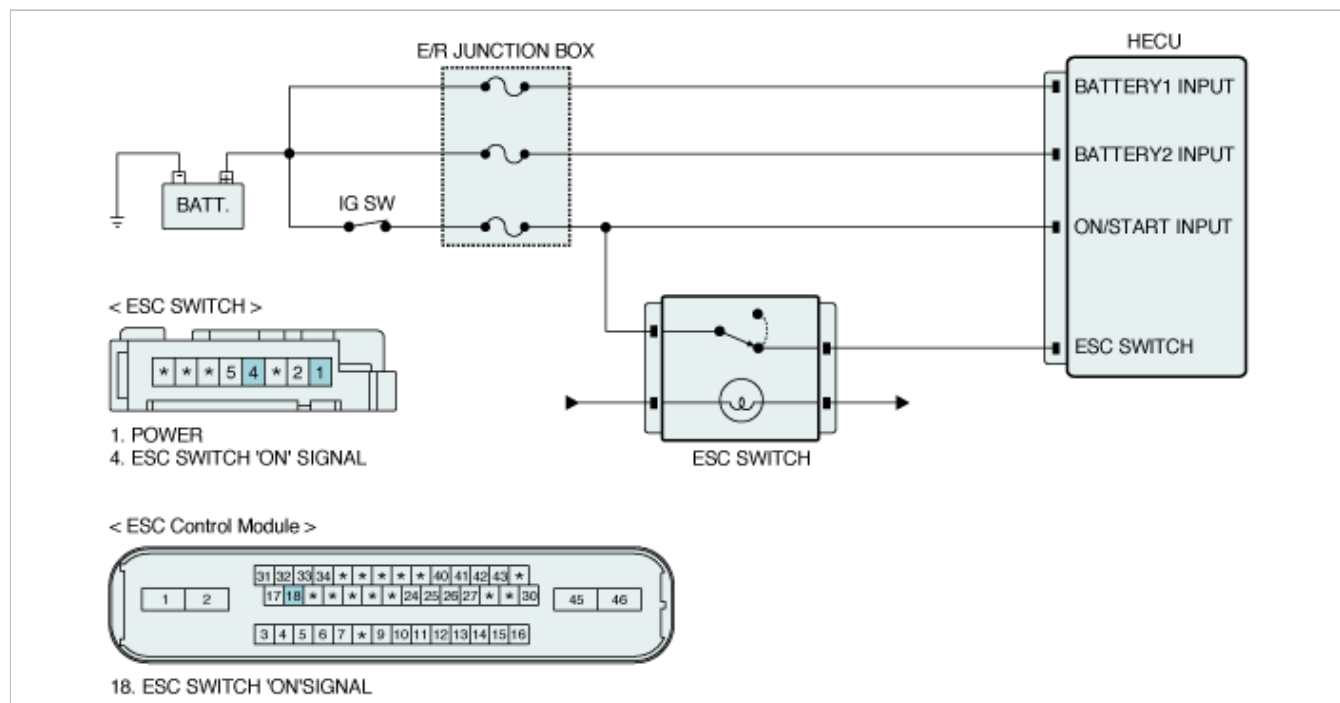
DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	• Circuit Monitoring	<ul style="list-style-type: none"> • Open or short ESC switch circuit • Faulty ESC switch
Enable Conditions	• When the ESC switch is ON for 1 minute.	
Fail Safe	<ul style="list-style-type: none"> • Inhibit the ESC control and allow the ABS/EBD control. • The ESC warning lamp is activated. 	

Specification

Engine ON	ESP switch HIGH	ESP switch LOW
	7.0V ~10V	0V ~3.0V

Diagnostic Circuit Diagram



Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Signal Circuit Inspection" procedure.

Signal Circuit Inspection

■ Open or Short Check

1. Ignition "ON" & Engine "OFF".
2. Press the ESC SWITCH.
3. Measure voltage between ESC switch signal terminal of the HECU harness connector and chassis ground.

Specification : Approx B+

4. Is the measured value within specifications?

YES	► Go to "Component Inspection" Procedure.
NO	► Check for open or blown fuse referring to "Circuit Diagram". Repair open or short in power circuit between battery and HECU harness connector and then, go to "Verification of vehicle Repair" procedure.

Component Inspection

■ ESC switch Check

1. Ignition "OFF" & Engine "OFF".
2. Disconnect the ESC switch connector.
3. Measure resistance between power terminal and signal terminal of the ESC switch connector.

Specification :

Approx. below 1Ω (In case of pressing the ESC switch)

Approx. ∞ Ω (In case of not pressing the ESC switch)

4. Is the measured value within specifications?

YES	► Fault is intermittent caused by poor connection in ESC switch harness and/or HECU's connector. Go to "Verification of Vehicle Repair" procedure.
NO	► Substitute with a known-good ESC switch and check for proper operation. If problem is corrected, replace ESC switch and then go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information.
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1513 Brake switch error**

General Description

This switch is mounted on the pedal assembly and is used to indicate brake pedal status to the HECU.

The switch is turned on when brake is pressed.

The brake light switch is a normally-open contact which runs to battery voltage when active (brake pressed).

When passive (brake released), the cable is grounded via the brake light bulbs.

DTC Description

The brake light signal is a reference to judge driver's intention for braking.

The HECU checks open or short circuit of brake light switch for normal ESC control.

If an error is present, the warning lamp will illuminate.

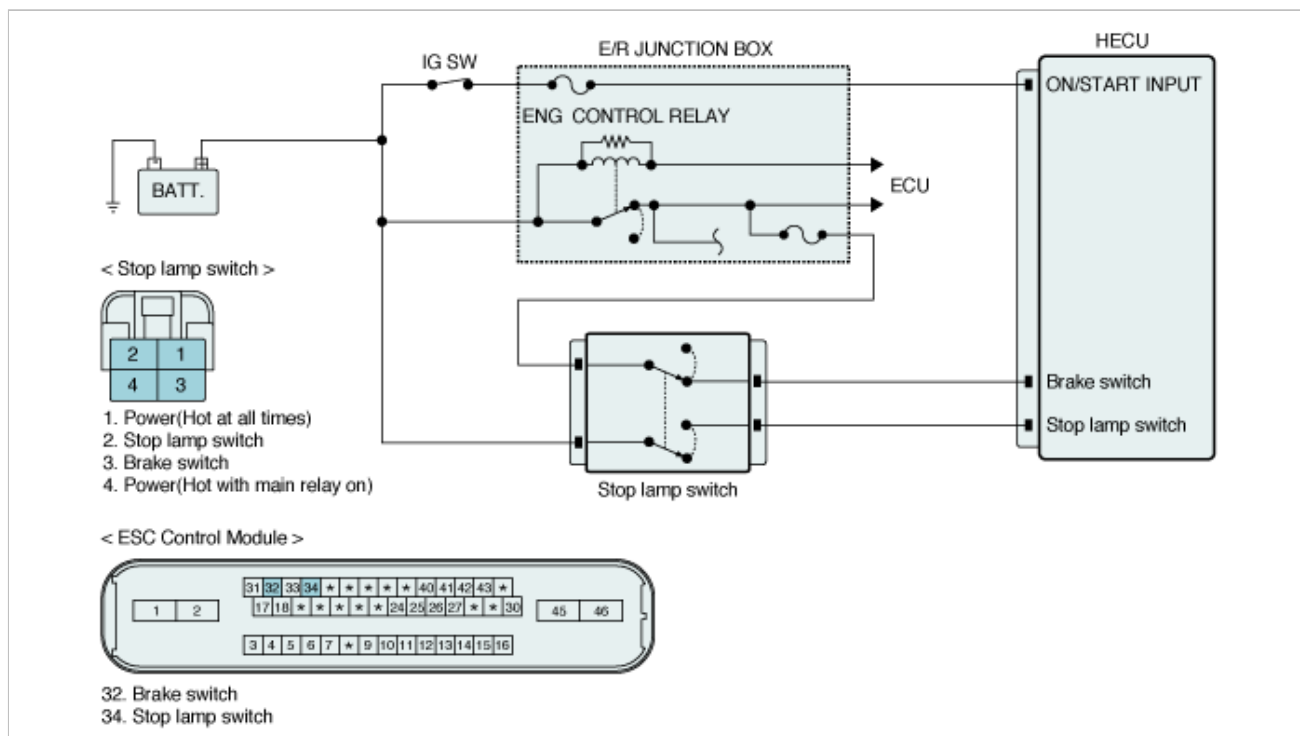
DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	<ul style="list-style-type: none"> • Open circuit monitoring 	<ul style="list-style-type: none"> • Open circuit in brake switch line • Faulty brake light switch • Faulty input stage in HECU
Enable Conditions	<ul style="list-style-type: none"> • If both BLS(brake lamp switch) and BS(brake switch) have a same state and MCP (Master Cylinder Pressure) >20bar for 500ms. • Outside an ABS/ESC control, and after normal operation of MCP, If the pressure sensor signal is higher than 20bar and BLS is low for 3sec. • If the BLS/BS changed more than 40times and MCP > 20bar for 5sec. • While Vehicle speed > 10km/h, TPS>5%, MCP < 7bar, if BLS is high over 1min. 	
Fail Safe	<ul style="list-style-type: none"> • Inhibit the ESC control and allow the ABS/EBD control. • The ESC warning lamp is activated. 	

Specification

Brake Light Switch	Voltage Range of "High"	Voltage Range of "Low"
	7.0V ~10V	0V ~3.0V

Diagnostic Circuit Diagram



Monitor Scantool Data

1. Connect scantool to Data Link Connector(DLC)
2. Ignition "ON" & Engine "OFF".
3. Press the brake pedal.
4. Monitor the "BRAKE SWITCH" parameter on the scantool.

Specification : It is changed to ON/OFF.

Sensor Name	Value	Ref. Min	Ref. Max	Unit
<input checked="" type="checkbox"/> Brake Lamp Switch	OFF	ON	ON	-
<input checked="" type="checkbox"/> Brake Switch	ON	ON	ON	-

Fig.1

Sensor Name	Value	Ref. Min	Ref. Max	Unit
<input checked="" type="checkbox"/> Brake Lamp Switch	ON	ON	ON	-
<input checked="" type="checkbox"/> Brake Switch	OFF	ON	ON	-

Fig.2

Fig 1) Service data at not pressing the break pedal

Fig 2) Service data at pressing the break pedal

5. Whenever brake pedal is pushed down, is the brake switch's scantool data changed ON/OFF?

YES	<p>► Fault is intermittent caused by poor connection in brake light switch harness and/or HECU's connector or was repaired and HECU memory was not cleared.</p> <p>Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.</p> <p>Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.</p>
NO	<p>► Go to "Terminal and Connector Inspection" procedure.</p>

Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Signal Circuit Inspection (brake pedal isn't depressed)" procedure.

Signal circuit inspection

Signal circuit inspection (brake pedal isn't pressed)

■ Open or Short Check

1. Ignition "ON" & Engine "OFF".
2. Measure voltage between stop lamp switch (brake switch) terminal of the HECU harness connector and chassis ground.

Specification : Stop lamp switch - 0V
Brake switch B - B+

3. Is the measured waveform within specifications?

YES	► Go to "Signal Circuit Inspection (brake pedal is pressed)" procedure.
NO	► Check for open or blown fuse referring to "Circuit Diagram". Repair open or short in power circuit between battery and HECU harness connector and then, go to "Verification of vehicle Repair" procedure. If there is no problem in circuit, Go to "Component Inspection" procedure.

Signal Circuit Inspection (brake pedal is pressed)

■ Open or Short Check

1. Ignition "ON" & Engine "OFF".
2. Press the brake pedal.
3. Measure voltage between stop lamp switch (brake switch) terminal of the HECU harness connector and chassis ground.

Specification : Stop lamp switch - B+
Brake switch B - 0 V

4. Is the measured waveform within specifications?

YES	► Go to "Component Inspection" procedure.
NO	► Check for open or blown fuse referring to "Circuit Diagram". Repair open or short in signal circuit between battery and HECU harness connector and then go to "Verification of vehicle Repair" procedure. If there is no problem in circuit, Go to "Component Inspection" procedure.

Component Inspection

■ Brake light switch Check

1. Ignition "OFF" & Engine "OFF".
2. Disconnect the stop lamp switch connector.
3. Measure resistance between power terminal and signal terminal of the stop lamp switch connector.

Specification :
Resistance between terminals of the stop lamp switch - $\infty\Omega$ (when the plunger is pushed down), 0Ω (when the plunger isn't pushed down).

Resistance between the terminals of the brake switch - $\infty\Omega$ (when the plunger is not pushed down), 0Ω (when the plunger is pushed down).

4. Is the measured value within specifications?

YES	► Fault is intermittent caused by poor connection in brake light switch harness and/or HECUs connector. Go to "Verification of Vehicle Repair" procedure.
NO	► Substitute with a known-good brake light switch and check for proper operation. If problem is corrected, replace brake light switch and then go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information.
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

General Description

The HECU consists of an ECU (Electronic Control Unit) and a HCU(Hydraulic Control Unit).

The HCU portion of the assembly contains a pump motor, solenoid valves, and accumulator.

Increase and decrease of hydraulic pressure is operated by electronic motor, according to a measured signal by wheel speed sensor.

The function of HCU is to increase, decrease or maintain the hydraulic pressure supplied to a wheel cylinder by operating return pump according to HECU control signal while ABS control is active.

The ECU monitors various sensor and switch inputs.

These inputs are used to make decisions regarding HCU component operation.

DTC Description

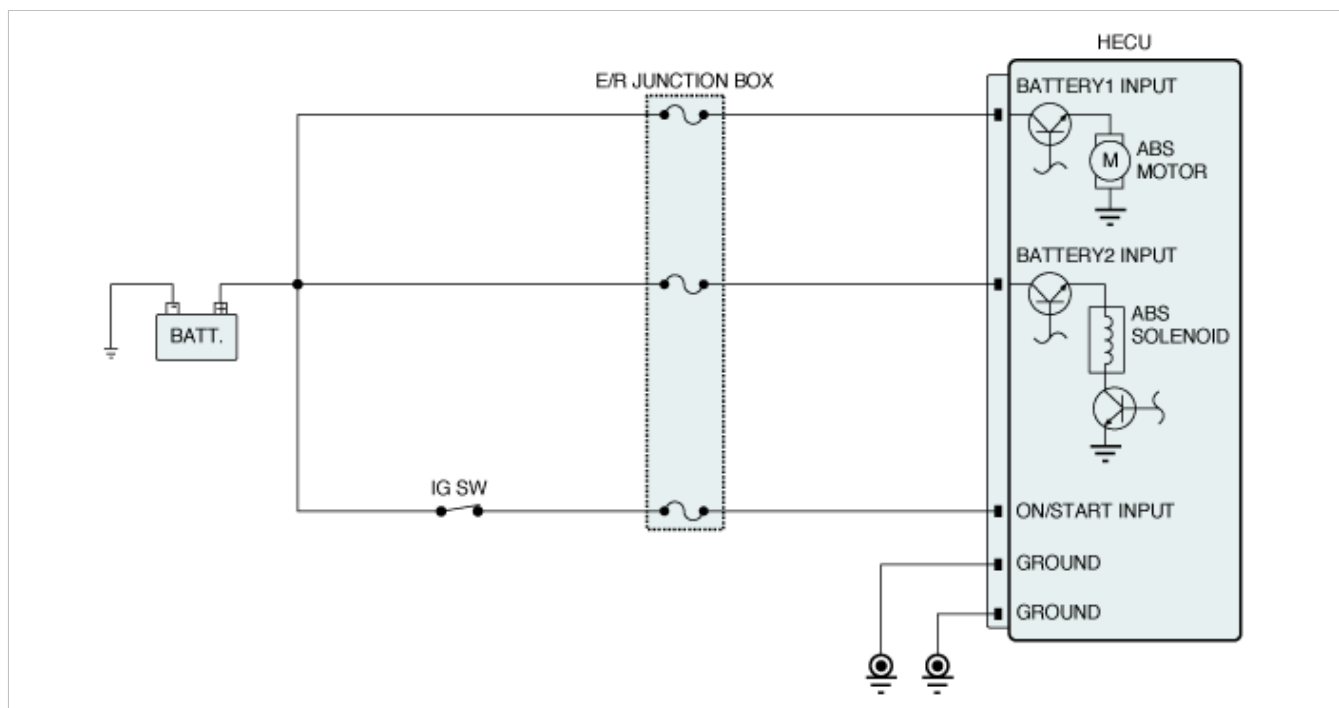
The HECU monitors the operation of the IC components such as memory, register, A/D converter and so on.

The ECU sets this code when the EEPROM data read by the master processor is different than prior data written, or when the master/slave processor detects abnormal operation in RAM, Status Register, Interrupt, Timer, A/D converter or cycle time.

DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	• Internal Monitoring	• Faulty HECU
Enable Conditions	<ul style="list-style-type: none"> • When the MCU cant erase or write a data of the EEPROM. • When the master/slave processor detects abnormal operation in RAM, status register, interrupt, timer, A/D converter and cycle time. 	
Fail Safe	<ul style="list-style-type: none"> • The ABS/EBD/ESC functions are inhibited. • The ABS/EBD/ESC warning lamps are activated. 	

Diagnostic Circuit Diagram



Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be

caused by interference from other electrical systems, and mechanical or chemical damage.

2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Component Inspection" Procedure.

Component Inspection

1. Ignition "OFF" & Engine "OFF".
2. Ignition "ON" & Engine "OFF".
3. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
4. Using a scantool, Clear DTC.
5. Select "Diagnostic Trouble Codes(DTCs)" mode again.
6. Are any DTCs present ?

YES	► Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.
NO	► Fault is intermittent caused by faulty HECU or was repaired and HECU memory was not cleared. Go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information.
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1605 CAN Hardware error**

General Description

The HECU send requirement data, such as Torque reduction, the number of fuel cut cylinders, and ESC control requests, to the Engine PCM(ECM & TCM) through CAN bus line.

The Engine PCM(ECM) performs fuel cut functions according to requests from the HECU and retards ignition timing by torque reduction requests.

The PCM(TCM) maintains current gear positions during ESC control time, in order not to increase power which causes a knockdown shift.

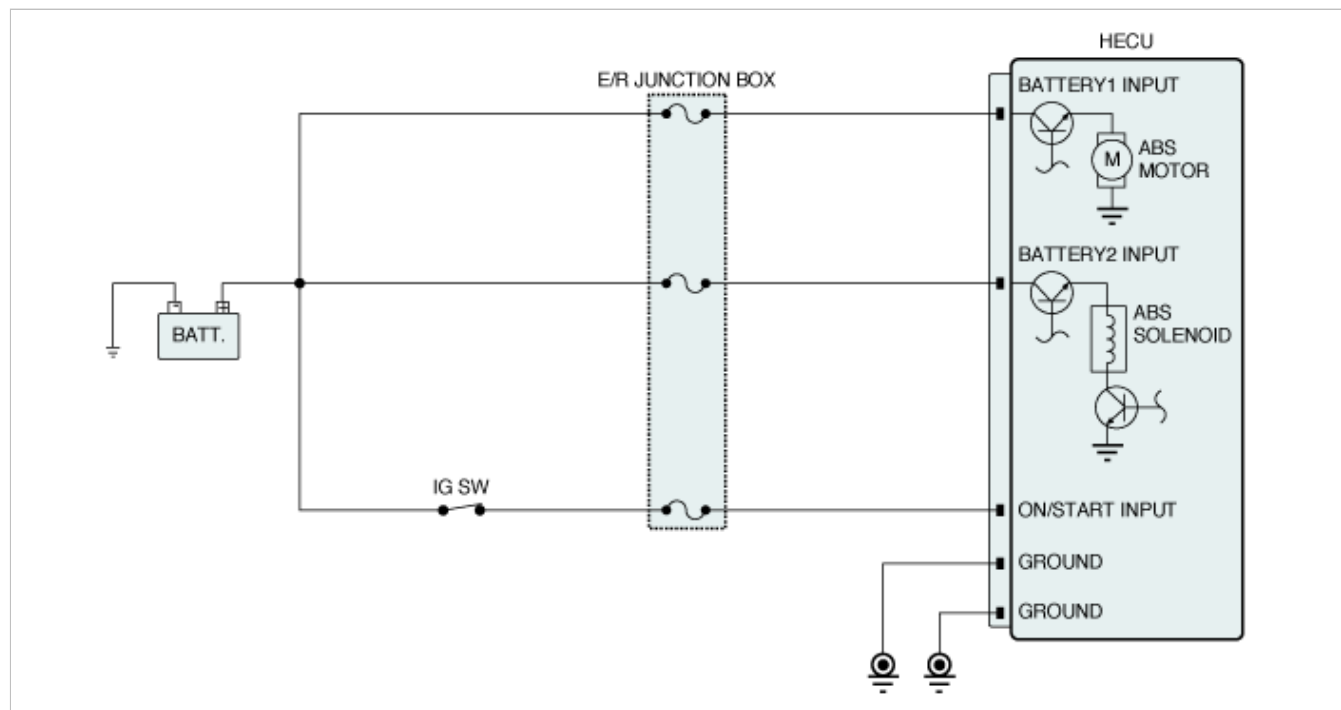
DTC Description

The HECU checks the CAN RAM for normal TCS control, and sets this code if a CAN RAM malfunction is detected.

DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	• CAN RAM monitoring	• Faulty HECU
Enable Conditions	• CAN Hardware failure.	
Fail Safe	<ul style="list-style-type: none"> • Inhibit the ESC control and allow the ABS/EBD control. • The ESC warning lamp is activated. • The ABS warning lamp is activated. 	

Diagnostic Circuit Diagram



Terminal and Connector Inspection

- Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
- Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
- Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
	► Go to "Component Inspection" Procedure.

NO	
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Component Inspection

1. Ignition "OFF" & Engine "OFF".
2. Ignition "ON" & Engine "OFF".
3. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
4. Using a scantool, Clear DTC.
5. Select "Diagnostic Trouble Codes(DTCs)" mode again.
- 6Are any DTCs present ?

YES	► Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.
NO	► Fault is intermittent caused by faulty HECU or was repaired and HECU memory was not cleared. Go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information.
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1611 CAN Time-out ECM**

General Description

The HECU send requirement data, such as Torque reduction, the number of fuel cut cylinders, and ESC control requests, to the Engine PCM(ECM & TCM) through CAN bus line.

The Engine PCM(ECM) performs fuel cut functions according to requests from the HECU and retards ignition timing by torque reduction requests.

The PCM(TCM) maintains current gear positions during ESC control time, in order not to increase power which causes a kickdown shift.

DTC Description

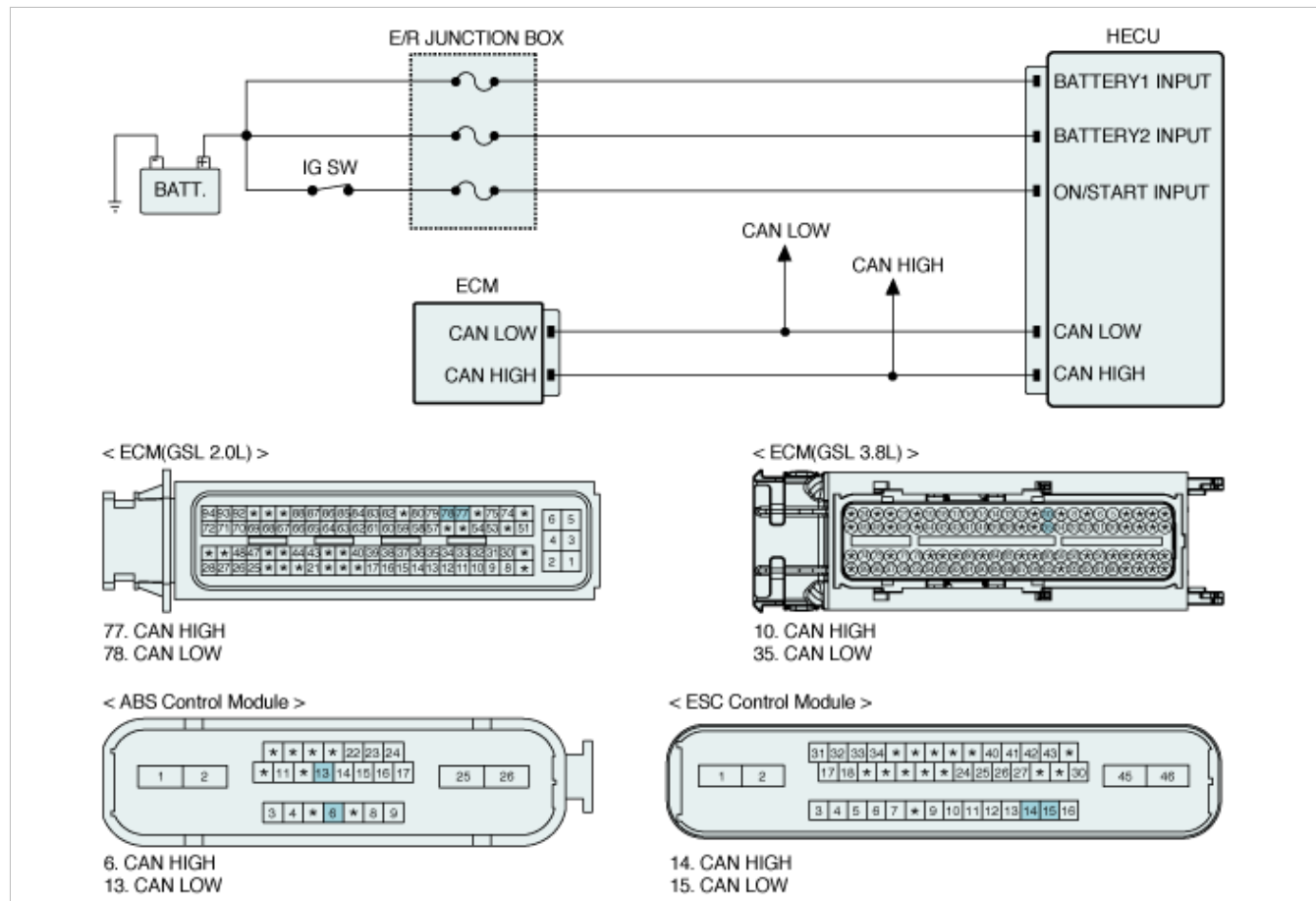
The HECU checks the CAN communication lines for normal ESC control, and sets this code if an ECM message is not received within 500ms.

The HECU does not detect this code until 2 seconds after the IG Key is turned to ON.

DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	<ul style="list-style-type: none"> CAN message monitoring 	<ul style="list-style-type: none"> Faulty PCM(ECM) Faulty HECU
Enable Conditions	<ul style="list-style-type: none"> In case that EMS1 or EMS2 message was not received for more than 500ms within normal voltage condition. - The Monitoring starts 2000 ms after Power Up. 	
Fail Safe	<ul style="list-style-type: none"> Inhibit the ESC control and allow the ABS/EBD control. The ESC warning lamp is activated. The ABS warning lamp is activated. 	

Diagnostic Circuit Diagram



Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Signal circuit inspection" procedure.

Signal circuit inspection

■ Open Check

1. Ignition "OFF" & Engine "OFF".
2. Disconnect HECU and ECM connector.
3. Measure resistance between CAN HIGH terminal(LOW terminal) of the HECU harness connector and CAN HIGH terminal(LOW terminal) of the ECM harness connector.

Specification : Approx. below 1Ω

4. Is the measured resistance within specifications?

YES	► Go to "Component inspection" procedure.
NO	► Repair open in CAN BUS line between HECU harness connector and ECM harness connector and then go to "Verification of Vehicle Repair" procedure.

Component Inspection

1. Ignition "OFF"
2. Ignition "ON" & Engine "OFF".
3. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
4. Using a scantool, Clear DTC.
5. Select "Diagnostic Trouble Codes(DTCs)" mode again.
6. Are any DTCs present ?

YES	► Substitute with a known-good PCM(ECM) and check for proper operation. If problem is corrected, replace PCM(ECM) and then go to "Verification of Vehicle Repair" procedure. If NG, replace HECU and then go to "Verification of Vehicle Repair" procedure.
NO	► Fault is intermittent caused by faulty HECU, faulty PCM(ECM) or was repaired and HECU memory was not cleared. Go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
 2. Using a scantool, Clear DTC.
 3. Operate the vehicle within DTC Detecting Condition in General Information.
 4. Using a scantool, Check DTC present.
 5. Are any DTCs present ?
-

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1612 CAN Time-out TCM**

General Description

The HECU send requirement data, such as Torque reduction, the number of fuel cut cylinders, and ESC control requests, to the Engine PCM(ECM & TCM) through CAN bus line.

The Engine PCM(ECM) performs fuel cut functions according to requests from the HECU and retards ignition timing by torque reduction requests.

The PCM(TCM) maintains current gear positions during ESC control time, in order not to increase power which causes a knockdown shift.

DTC Description

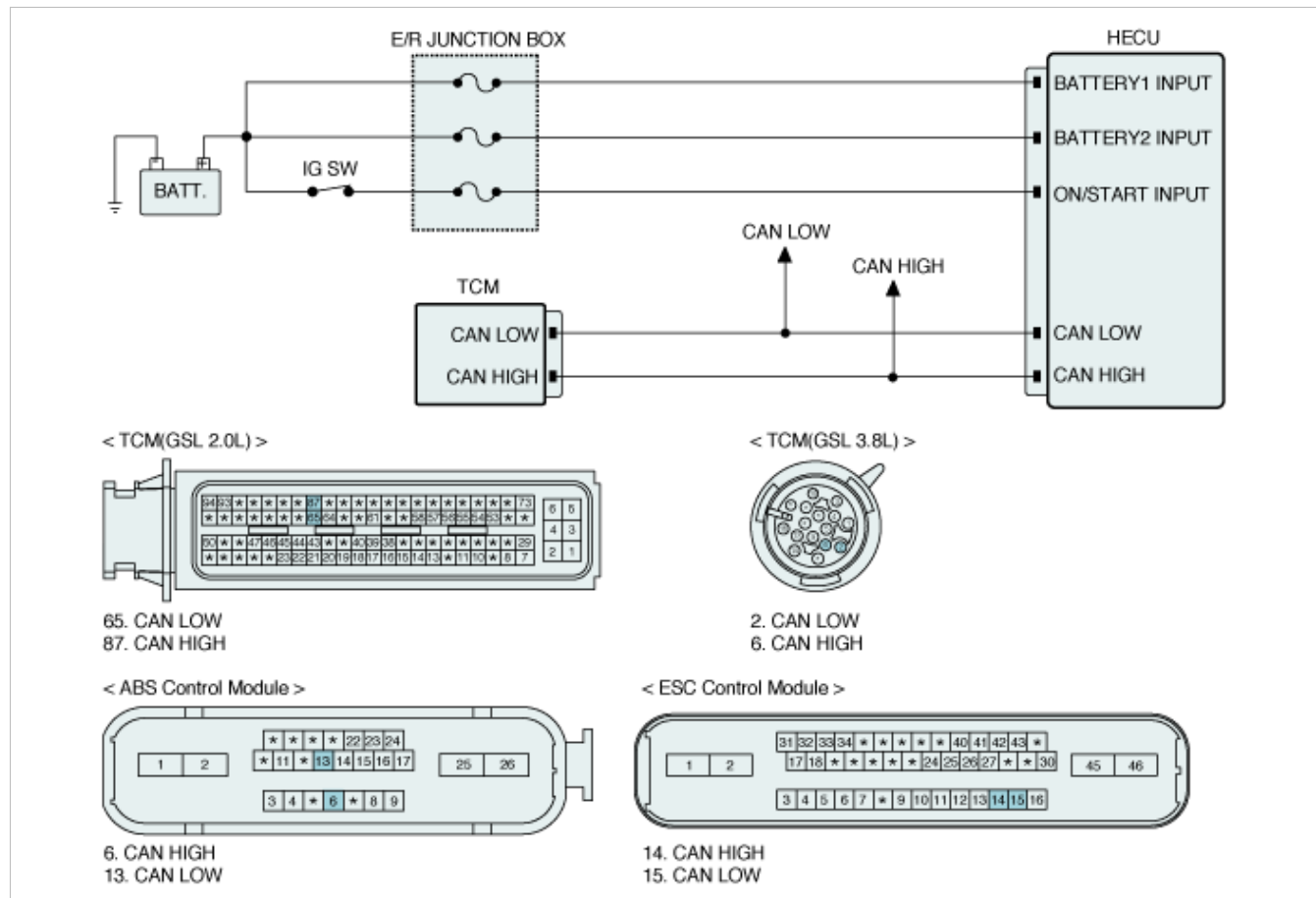
The HECU checks the CAN communication lines for normal ESC control, and sets this code if an TCM message is not received within 500ms.

The HECU does not detect this code until 2 seconds after the IG Key turned to ON.

DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	<ul style="list-style-type: none"> CAN message monitoring 	<ul style="list-style-type: none"> Faulty PCM(TCM) Faulty HECU
Enable Conditions	<ul style="list-style-type: none"> In case that TCM message was not received for more than 500ms within normal voltage condition. - The Monitoring starts 2000 ms after Power Up. 	
Fail Safe	<ul style="list-style-type: none"> Inhibit the ESC control and allow the ABS/EBD control. The ESC warning lamp is activated. The ABS warning lamp is activated. 	

Diagnostic Circuit Diagram



Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Signal circuit inspection" procedure.

Signal circuit inspection

■ Open Check

1. Ignition "OFF" & Engine "OFF".
2. Disconnect HECU and ECM connector.
3. Measure resistance between CAN HIGH terminal(LOW terminal) of the HECU harness connector and CAN HIGH terminal(LOW terminal) terminal of the TCM harness connector.

Specification : Approx. below 1Ω

4. Is the measured resistance within specifications?

YES	► Go to "Component inspection" procedure.
NO	► Repair open in CAN BUS line between HECU harness connector and TCM harness connector and then go to "Verification of Vehicle Repair" procedure.

Component Inspection

1. Ignition "OFF"
2. Ignition "ON" & Engine "OFF".
3. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
4. Using a scantool, Clear DTC.
5. Select "Diagnostic Trouble Codes(DTCs)" mode again.
6. Are any DTCs present ?

YES	► Substitute with a known-good PCM(TCM) and check for proper operation. If problem is corrected, replace PCM(TCM) and then go to "Verification of Vehicle Repair" procedure. If NG, replace HECU and then go to "Verification of Vehicle Repair" procedure.
NO	► Fault is intermittent caused by faulty HECU, faulty PCM(TCM) or was repaired and HECU memory was not cleared. Go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
 2. Using a scantool, Clear DTC.
 3. Operate the vehicle within DTC Detecting Condition in General Information.
 4. Using a scantool, Check DTC present.
 5. Are any DTCs present ?
-

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1613 CAN Wrong Message**

General Description

The HECU send requirement data, such as Torque reduction, the number of fuel cut cylinders, and ESC control requests, to the Engine PCM(ECM & TCM) through CAN bus line.

The Engine PCM(ECM) performs fuel cut functions according to requests from the HECU and retards ignition timing by torque reduction requests.

The PCM(TCM) maintains current gear positions during ESC control time, in order not to increase power which causes a knockdown shift.

DTC Description

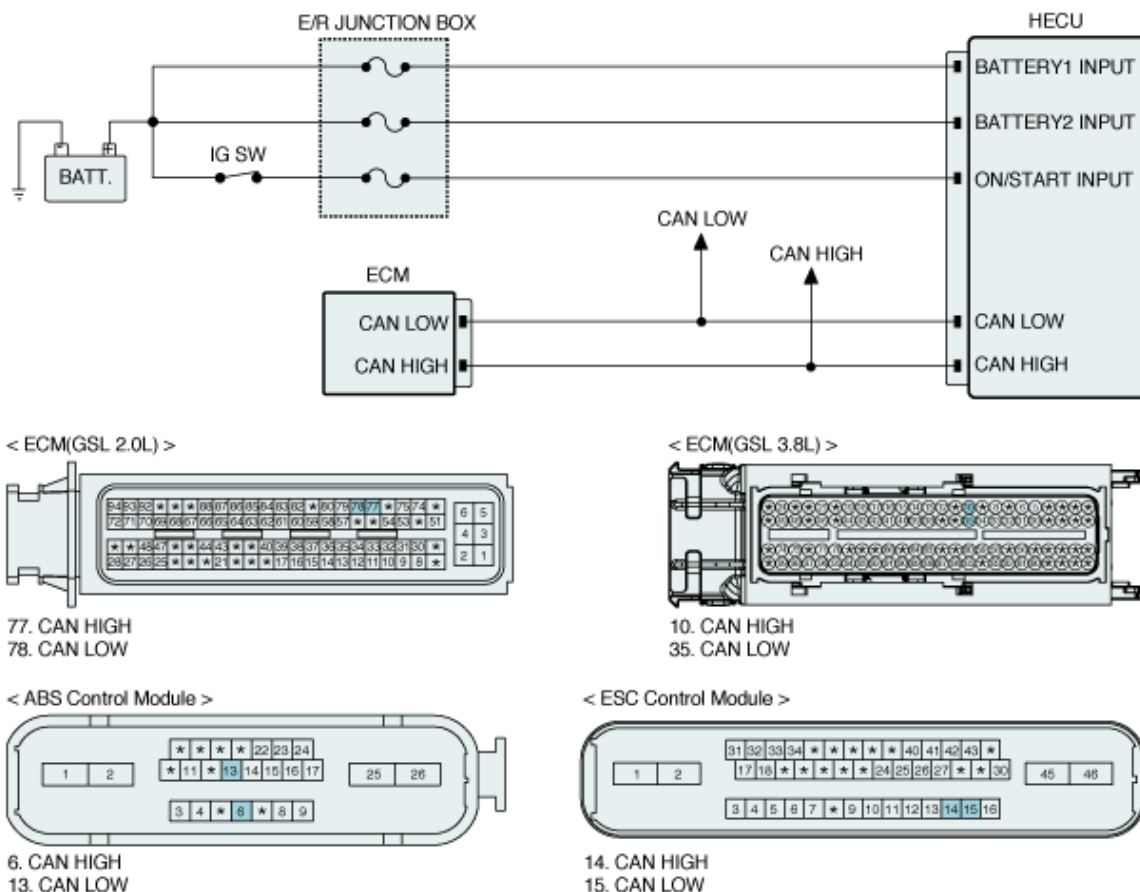
The HECU checks the CAN communication lines for normal ESC control, and sets this code if the data received between the EMS2 and TCM is not the same.

The HECU will not detect this code until 2 seconds after the IG KEYs turned ON.

DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	<ul style="list-style-type: none">• CAN message monitoring	<ul style="list-style-type: none">• Faulty PCM(ECM)• Faulty HECU
Enable Conditions	<ul style="list-style-type: none">• In case that the information about transmission is different in the EMS2 message and TCM message within normal voltage condition.- The Monitoring starts 2000 ms after Power Up.	
Fail Safe	<ul style="list-style-type: none">• Inhibit the ESC control and allow the ABS/EBD control.• The ESC warning lamp is activated.• The ABS warning lamp is activated.	

Diagnostic Circuit Diagram



Component Inspection

1. Ignition "OFF"
2. Ignition "ON" & Engine "OFF".
3. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
4. Using a scantool, Clear DTC.
5. Select "Diagnostic Trouble Codes(DTCs)" mode again.
6. Are any DTCs present ?

YES	► Substitute with a known-good PCM(ECM) and check for proper operation. If problem is corrected, replace PCM(ECM) and then go to "Verification of Vehicle Repair" procedure. If NG, replace HECU and then go to "Verification of Vehicle Repair" procedure.
NO	► Fault is intermittent caused by faulty HECU, faulty PCM(ECM) or was repaired and HECU memory was not cleared. Go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information.
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
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NO

► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1616 CAN Bus off**

General Description

The HECU send requirement data, such as Torque reduction, the number of fuel cut cylinders, and ESC control requests, to the Engine PCM(ECM & TCM) through CAN bus line.

The Engine PCM(ECM) performs fuel cut functions according to requests from the HECU and retards ignition timing by torque reduction requests.

The PCM(TCM) maintains current gear positions during ESC control time, in order not to increase power which causes a kickdown shift.

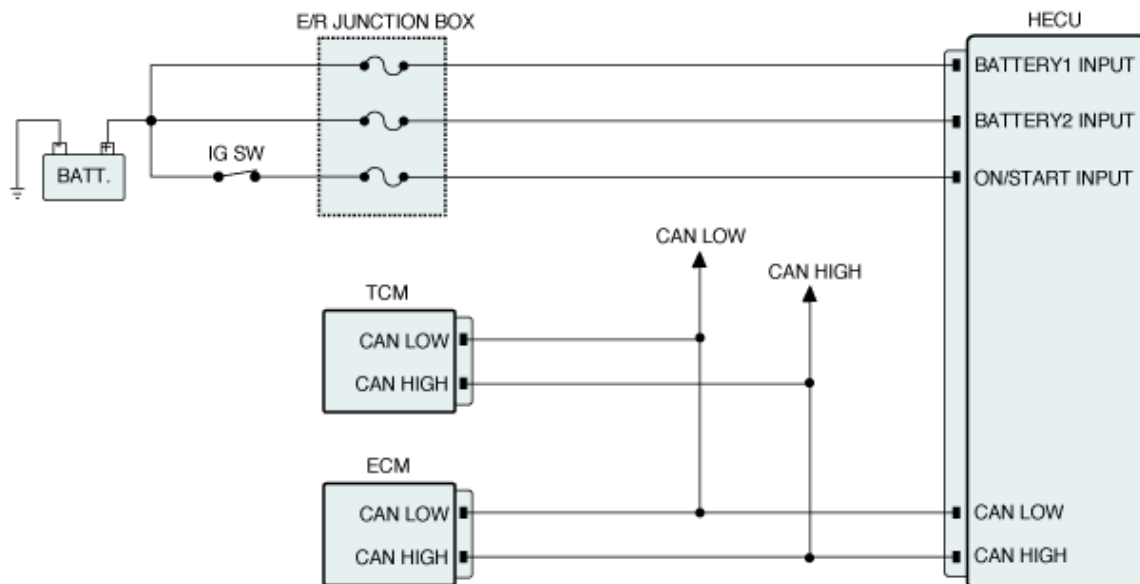
DTC Description

The HECU checks the CAN communication lines for normal TCS control, and sets this code if CAN BUS OFF status is detected for more than 100ms.

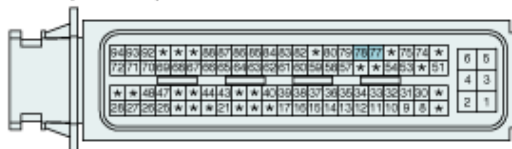
DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	• Open or short circuit monitoring	• Open or short circuit in CAN line • Faulty HECU
Enable Conditions	• In case CAN BUS off state continued for more than 100ms.	
Fail Safe	• Inhibit the ESC control and allow the ABS/EBD control. • The ESC warning lamp is activated. • The ABS warning lamp is activated.	

Diagnostic Circuit Diagram

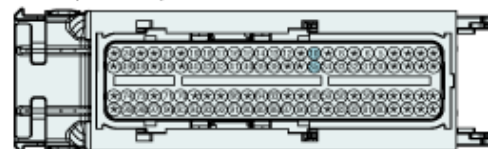


< ECM(GSL 2.0L) >



77. CAN HIGH
78. CAN LOW

< ECM(GSL 3.8L) >



10. CAN HIGH
35. CAN LOW

< TCM(GSL 2.0L) >



65. CAN LOW
87. CAN HIGH

< TCM(GSL 3.8L) >



2. CAN LOW
6. CAN HIGH

< ABS Control Module >



6. CAN HIGH
13. CAN LOW

< ESC Control Module >



14. CAN HIGH
15. CAN LOW

Terminal and Connector Inspection

- Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
- Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
- Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "CAN Signal Circuit Inspection" procedure.

CAN Signal Circuit Inspection

■ Short Check (to ground)

1. Ignition "OFF" & Engine "OFF".
2. Disconnect ECM/ TCM connector and the HECU connector.
3. Measure resistance between CAN-High terminal of ECM/TCM harness connector and CAN-High terminal of the HECU harness connector.
4. Measure resistance between CAN-Low terminal of ECM/TCM harness connector and CAN-Low terminal of the HECU harness connector.

Specification : Approx. below 1Ω

5. Is the measured value within specifications?

YES	► Go to "Check CAN communication line for short" procedure.
NO	► Repair open in the CAN communication line between ECM/TCM ECU and HECU, Go to "Verification of Vehicle Repair" procedure.

■ Check CAN communication line for short

1. Ignition "OFF" & Engine "OFF".
2. Disconnect ECM/TCM connector and HECU connector.
3. Measure resistance between CAN-High terminal of ECM/TCM harness connector and chassis ground.
4. Measure resistance between CAN-Low terminal of ECM/TCM harness connector and chassis ground.
5. Measure resistance between CAN-High terminal and CAN-Low of ECM/TCM harness connector.

Specification : Infinite (∞ Ω)

6. Is the measured value within specifications?

YES	► Go to "Component Inspection" procedure.
NO	► Repair short in the CAN communication line between ECM/TCM/4WD ECU and HECU, Go to "Verification of Vehicle Repair" procedure.

Component Inspection

1. Ignition "OFF"
2. Ignition "ON" & Engine "OFF".
3. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
4. Using a scantool, Clear DTC.
5. Select "Diagnostic Trouble Codes(DTCs)" mode again.

6. Are any DTCs present ?

YES	► Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.
NO	► Fault is intermittent caused by poor connection in CAN signal harness and/or HECU's connector. Go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information.

4. Using a scantool, Check DTC present.

5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C1647 CAN Hardware Error - Sensor Channel**

General Description

When the vehicle is turning with respect to a vertical axis, the yaw rate sensor detects the yaw rate electronically by the vibration change of plate fork inside the yaw rate sensor.

If yaw velocity reaches the specific velocity after it detects the vehicle's yawing, the ESC control is reactivated.

The lateral G sensor senses vehicle's lateral G. A small element inside the sensor is attached to a deflectable lever arm by lateral G.

Direction and magnitude of lateral G loaded to vehicle can be known with electrostatic capacity changing according to lateral G.

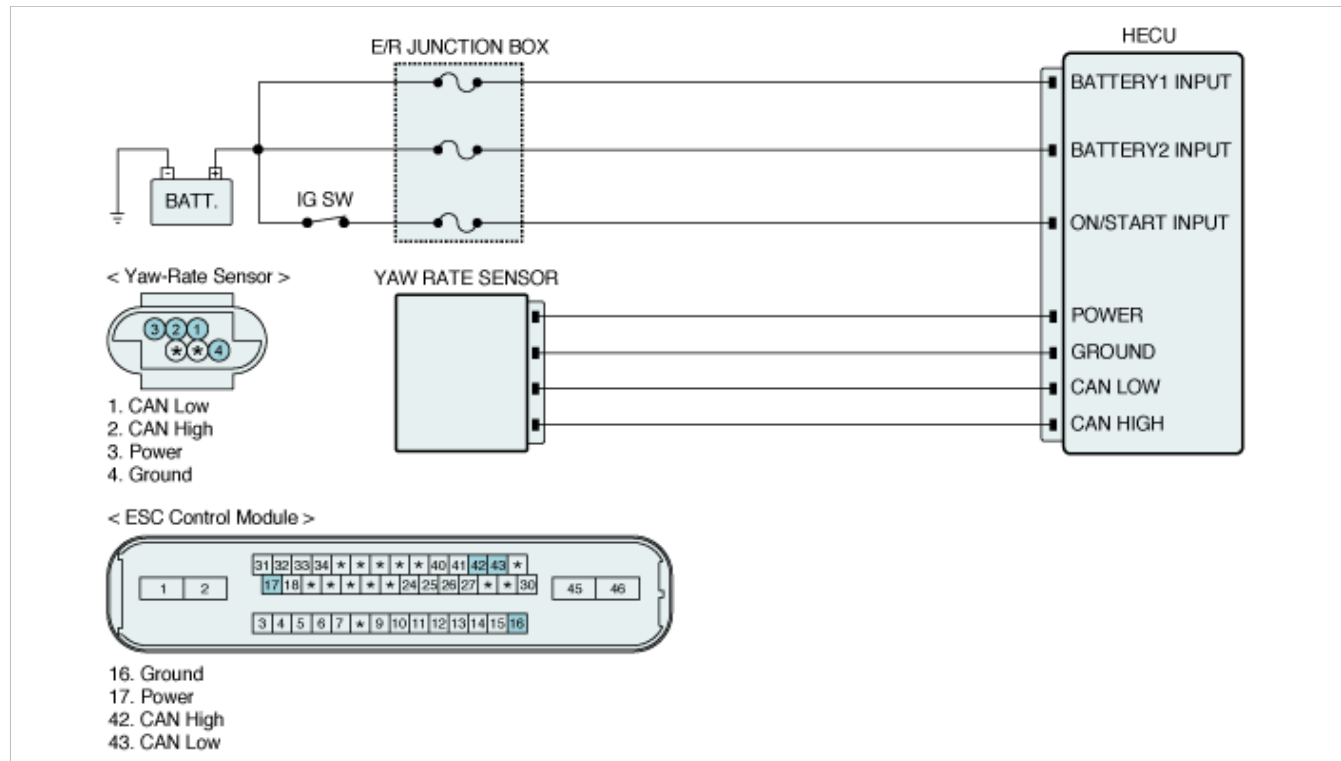
DTC Description

The HECU checks the sensor CAN H/W for normal ESC control, and sets this code if a sensor CAN H/W malfunction is detected.

DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	• Internal Monitoring	<ul style="list-style-type: none"> • Faulty HECU • Faulty Yaw Rate & Lateral G sensor
Enable Conditions	• Sensor CAN H/W failure.	
Fail Safe	<ul style="list-style-type: none"> • Inhibit the ESC control and allow the ABS/EBD control. • The ESC warning lamp is activated. 	

Diagnostic Circuit Diagram



Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Component Inspection" Procedure.

Component Inspection

1. Ignition "OFF" & Engine "OFF".
2. Ignition "ON" & Engine "OFF".
3. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
4. Using a scantool, Clear DTC.
5. Select "Diagnostic Trouble Codes(DTCs)" mode again.
- 6Are any DTCs present ?

YES	► Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.
NO	► Fault is intermittent caused by faulty HECU or was repaired and HECU memory was not cleared. Go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information.
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C2112 Valve Relay Error**

General Description

The HECU supplies battery power to all solenoid valves with a valve relay which is controlled by the Electronic Control UNIT(ECU).

The valve relay and all solenoid valves are installed inside the HECU (Hydraulic and Electronic Control Unit).

DTC Description

ABS ECU monitors voltage of the valve relay to check if ABS ECU can perform ABS control normally.

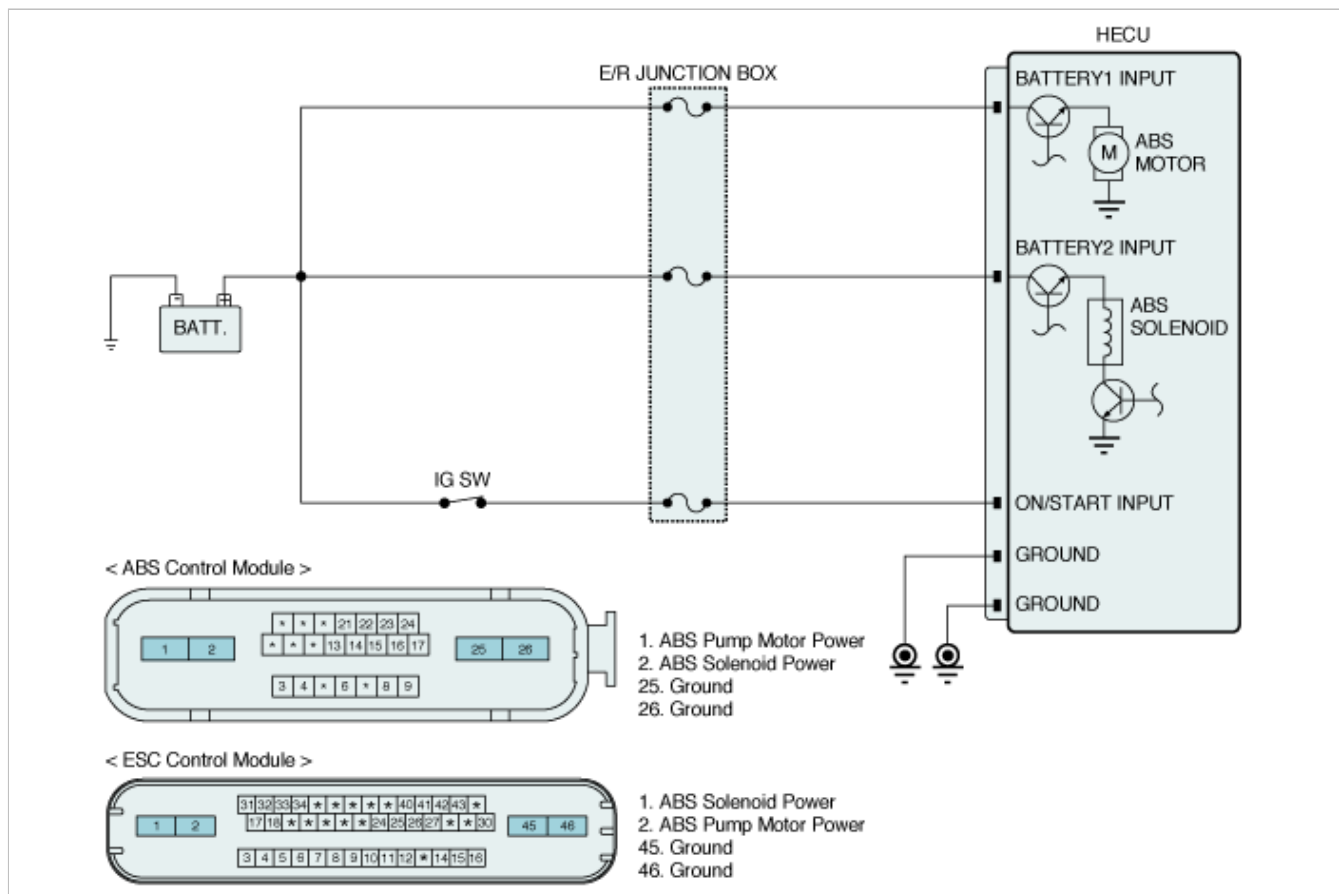
When the valve relay is switched to ON, the HECU will set this code if the solenoid drive voltage is below permissible voltage ranges for a period of time.

When the valve relay is switched to OFF, the HECU sets this code if the solenoid drive voltage is over the permissible voltage range for a period of time.

DTC Detecting Condition

Item		Detecting Condition	Possible cause
DTC Strategy		• Voltage Monitoring	<ul style="list-style-type: none"> • Open or short of power supply circuit • Blown fuse • Faulty HECU
Case1 (Open)	Enable Conditions	• If the valve relay is switched on and the reference voltage of valve relay < $5\pm0.5V$ continuously for 50ms, the failure is detected.	
Case2 (Short or leakage)	Enable Conditions	• If the valve relay is switched off and voltage of valve relay > $60.5V$ or < $2.5\pm0.5V$ continuously for 50ms, the failure is detected.	
Fail Safe		<ul style="list-style-type: none"> • The ABS/EBD/ESC functions are inhibited. • The ABS/EBD/ESC warning lamps are activated. 	

Diagnostic Circuit Diagram



Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Power Circuit Inspection" procedure.

Power Circuit Inspection

■ Open or Short Check

1. Ignition "ON" & Engine "OFF".
2. Measure voltage between power terminal of the HECU harness connector and chassis ground.

Specification : B+

3. Is the measured value within specifications?

YES	► Go to "Ground Circuit Inspection" procedure.
NO	► Check for open or blown fuse referring to "Circuit Diagram". Repair open or short in power circuit between battery and HECU harness connector and then, go to "Verification of vehicle Repair" procedure.

Ground Circuit Inspection

■ Open or Short Check

1. Ignition "OFF" & Engine "OFF".
2. Disconnect the HECU connector.
3. Measure resistance between ground terminal of the HECU harness connector and chassis ground.

Specification : Approx. below 1Ω

4. Is the measured value within specifications?

YES	► Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.
NO	► Repair open or short in ground circuit between HECU harness connector and chassis ground, and then go to "Verification of vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information.
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.

NO

► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C2126 Vacuum Pump Relay Drive Pin Open/Short**

General Description

The Vacuum Pump System is set up in a vehicle in order to make the vacuum enough when a driver presses the brake pedal on the high ground. To operate this system, the vacuum pump is installed on a vehicle.

If the vacuum is not sufficient to press the brake pedal, the HECU senses it through the vacuum switch, which is installed on booster. And then the HECU supplies the power to the vacuum pump by grounding the circuit of the vacuum pump relay. When the vacuum pump is supplied with electric power, it makes the vacuum and supplements it to the booster.

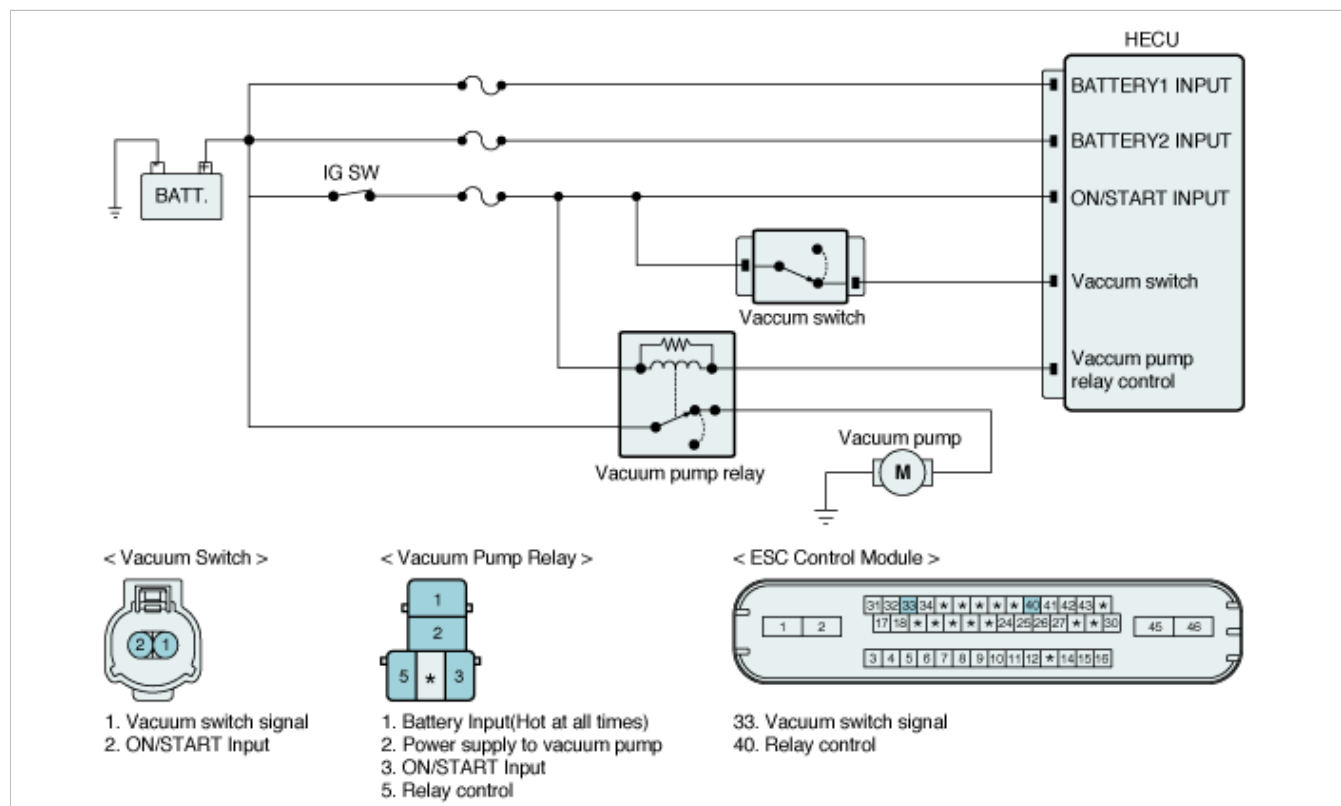
DTC Description

The HECU monitors the vacuum pump relay for a normal operation and if there is a open or short circuit in the relay, this DTC is set.

DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	• Voltage Monitoring	<ul style="list-style-type: none"> • Open or short in the vacuum pump relay circuit • Faulty vacuum pump relay
Enable Conditions	<ul style="list-style-type: none"> • When the vacuum pump relay is switched off, the vacuum pump relay drive monitor has a low value for more than a certain period • When the vacuum pump relay is switched on, the vacuum pump relay drive monitor has a high value for more than a certain period 	
Fail Safe	• -	

Diagnostic Circuit Diagram



Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.

2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Power Circuit Inspection" procedure.

Power Circuit Inspection

■ Open or Short Check

1. Ignition "OFF"
2. Disconnect Vacuum Pump Relay.
3. Ignition "ON" & Engine "OFF"
4. Measure voltage between power terminal of Vacuum Pump Relay harness connector and chassis ground.

Specification : Battery voltage

5. Is the measured value within specifications?

YES	► Go to "Control Circuit Inspection" procedure.
NO	► Check for open or blown fuse referring to "Circuit Diagram". Repair open or short in power circuit between battery and the relay and then, Go to "Verification of vehicle Repair" procedure.

Control Circuit Inspection

■ Open Check

1. Ignition "OFF"
2. Disconnect Vacuum Pump Relay and HECU connector.
3. Measure resistance between control terminal of Vacuum Pump Relay harness connector and Vacuum Pump Relay control terminal of HECU harness connector.

Specification : Approx. below 1Ω

4. Is the measured value within specifications?

YES	► Go to "Short Check" procedure.
NO	► Repair open in control circuit between the vacuum pump relay and HECU and then, Go to "Verification of vehicle Repair" procedure.

■ Short Check

1. Ignition "OFF"
2. Disconnect Vacuum Pump Relay and HECU connector.
3. Measure resistance between control terminal of Vacuum Pump Relay harness connector and chassis ground.

Specification : Infinite (∞ Ω)

4. Is the measured value within specifications?

YES	► Substitute with a known-good Vacuum Pump Relay and check for proper operation. If problem is corrected, replace Vacuum Pump Relay and then go to "Verification of Vehicle Repair"
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	procedure.
NO	► Repair short in control circuit between Vacuum Pump Relay and HECU, and then go to "Verification of vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information.
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control) System > C2227 Excessive Temperature Of Brake Disc

General Description

BTCS (Brake Traction Control System) is operated when the value (Wheel acceleration value + speed difference value) exceeds the specified value when vehicle speed is lower than the 50 Km/h.

The BTCS installed HECU calculates the DISC temperature logically, which is an assumed value, by using the value of Wheel speed, vehicle speed change, CONTROL MODE and BLS SIGNAL.

Assumed DISC Temperature is used to protect DISC overheating, caused by long-time operation, which may cause a decrease in brake efficiency.

DTC Description

If the HECU decides that the Disc is over-heated (above 500°C), then it turns the ESC lamp ON and inhibits BTCS operation to protect overheating of the disc.

If the calculated temperature becomes lower than specified value (approx. 300°C), then the HECU turns the ESC lamp OFF and operates the BTCS again.

DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	<ul style="list-style-type: none">Internal monitoring	<ul style="list-style-type: none">Brake disk over heat
Enable Conditions	<ul style="list-style-type: none">When the calculated temperature of disc is higher than predefined value(500°C). If the calculated temperature drops below 300°C, the controller recovers to normal state.- When IGN switched OFF, HECU calculate temperature of disc until calculated temperature drops below 80°C by BATT1 power.	
Fail Safe	<ul style="list-style-type: none">Inhibit the ESC control and allow the ABS/EBD control.The ESC warning lamp is activated.	

Component Inspection

1. Wait until the brake disc cool down sufficiently.
2. Ignition "OFF" & Engine "OFF".
3. Ignition "ON" & Engine "OFF".
4. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
5. Using a scantool, Clear DTC.
6. Select "Diagnostic Trouble Codes(DTCs)" mode again.
7. Are any DTCs present ?

YES	<ul style="list-style-type: none">Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.
NO	<ul style="list-style-type: none">Fault is caused by Faulty HECU or was repaired and HECU memory was not cleared. The DTC code can be set by excessive TCS control in normal system status. Go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information.
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control) System > C2231 Vacuum Pump System Fail

General Description

The Vacuum Pump System is set up in a vehicle in order to make the vacuum enough when a driver presses the brake pedal on the high ground. To operate this system, the vacuum pump is installed on a vehicle.

If the vacuum is not sufficient to press the brake pedal, the HECU senses it through the vacuum switch, which is installed on booster. And then the HECU supplies the power to the vacuum pump by grounding the circuit of the vacuum pump relay. When the vacuum pump is supplied with electric power, it makes the vacuum and supplements it to the booster.

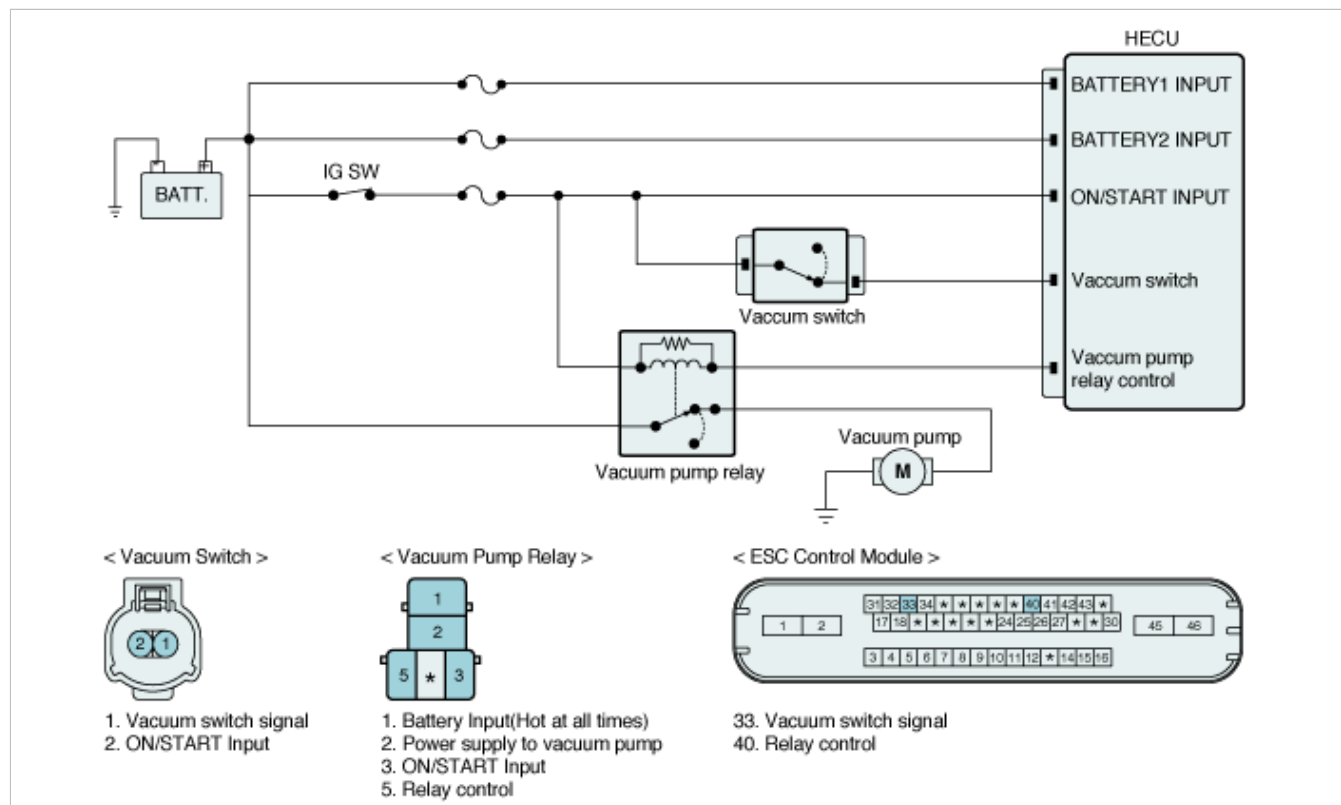
DTC Description

The HECU monitors the vacuum pump system for a normal operation and if it senses that there is a problem in the vacuum pump system, this DTC is set.

DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	• System Monitoring	<ul style="list-style-type: none"> • Poor connection • Faulty vacuum pump • Faulty vacuum switch • Faulty HECU
Enable Conditions	• After the consecutive 2 operation cycles, the vacuum switch's signal is "ON"	
Fail Safe	• -	

Diagnostic Circuit Diagram



Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
3. Has a problem been found?

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YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Component Inspection" procedure.

Component Inspection

1. Ignition "OFF" & Engine "OFF".
2. Disconnect the vacuum pump connector.
3. Supply the vacuum pump with the electric power(12V).
(At the same time, Connect the ground terminal of the vacuum pump connector to a chassis ground)
4. Check if the vacuum pump is running normally.
5. Does the vacuum pump operate well?

YES	► 1) Substitute with a known-good vacuum switch and check for proper operation. If problem is corrected, replace it and then go to "Verification of Vehicle Repair" procedure. 2) Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace it and then go to "Verification of Vehicle Repair" procedure.
NO	► Substitute with a known-good vacuum pump and check for proper operation. If problem is corrected, replace it and then go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information.
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C2380 ABS/TCS/ESC(ESP) valve error**

General Description

The ABS HECU is composed of a ECU (Electronic Control Unit) and an HCU(Hydraulic Control Unit), so the HECU hardware includes all solenoid valves inside the unit as well as the ECU.

Solenoid valves are switched to ON, OFF by HECU when the ABS is activated. Solenoid valves function is to increase, decrease or maintain the hydraulic pressure supplied to a wheel cylinder.

DTC Description

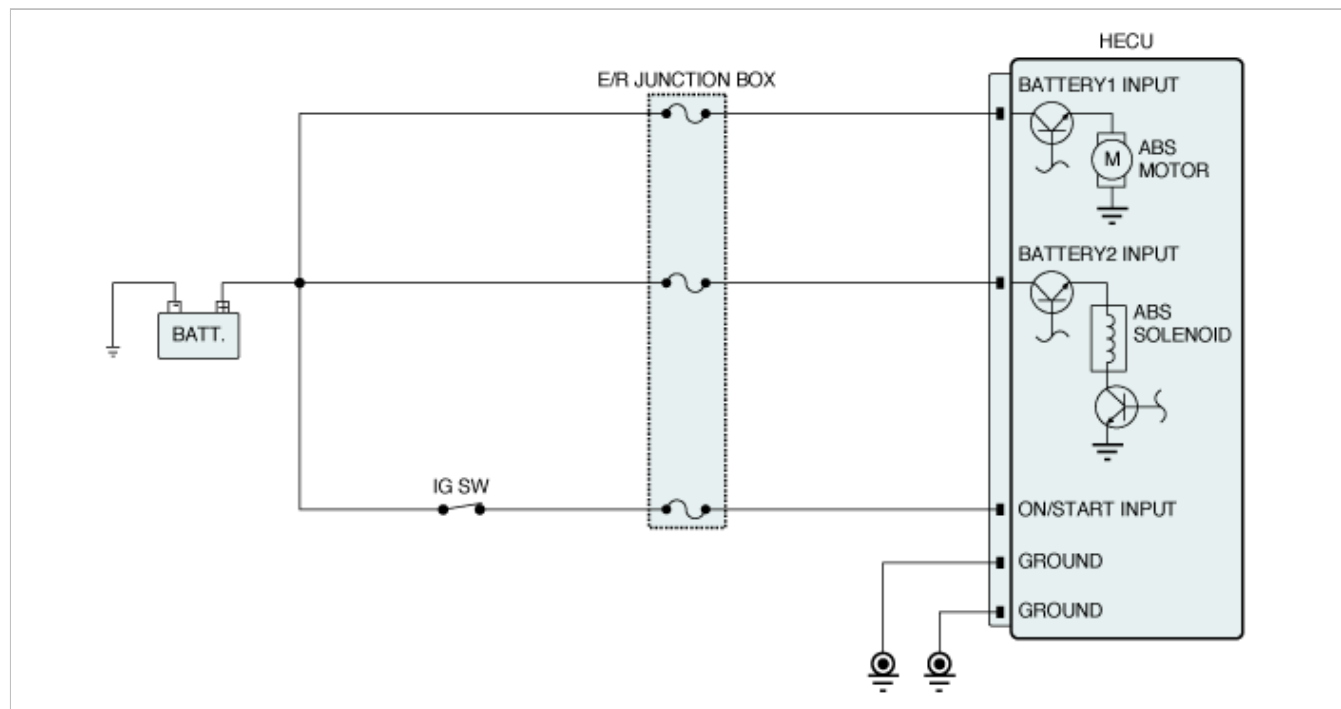
The HECU monitors the operation of the valves by checking the drive circuit of the solenoid valves, and then sets this code when the unexpcted drive voltage is detected.

For example, the HECU sets the DTC if an unexpected high drive voltage is detected when the valve relay is switched to OFF. (or unexpected low voltage is detected when the solenoid valve drive TR is switched to ON)

DTC Detecting Condition

Item	Detecting Condition	Possible cause
DTC Strategy	<ul style="list-style-type: none"> Internal monitoring 	<ul style="list-style-type: none"> Faulty HECU
Enable Conditions	<ul style="list-style-type: none"> If the valve relay is switched ON and corresponding solenoid driver OFF and the voltage of solenoid < $3.5 \pm 0.5V$ continuously for 56ms, the failure is detected. If the valve relay is switched ON and corresponding solenoid driver ON and the voltage of solenoid > $1.5 \pm 0.5V$ continuously for 56ms, the failure is detected. 	
Fail Safe	<ul style="list-style-type: none"> The ABS/EBD/ESC functions are inhibited. The ABS/EBD/ESC warning lamps are activated. 	

Diagnostic Circuit Diagram



Terminal and Connector Inspection

1. Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or

damage.

3. Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Component Inspection" Procedure.

Component Inspection

1. Ignition "OFF" & Engine "OFF".
2. Ignition "ON" & Engine "OFF".
3. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
4. Using a scantool, Clear DTC.
5. Select "Diagnostic Trouble Codes(DTCs)" mode again.

6Are any DTCs present ?

YES	► Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.
NO	► Fault is intermittent caused by faulty HECU or was repaired and HECU memory was not cleared. Go to "Verification of Vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information. (Start and drive vehicle in gear and maintain vehicle speed at or above 40kmh. (24mph))
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > C2402 Motor Failure**

General Description

The ABS ECU supplies battery power to the electric motor by way of a motor relay which is controlled by the Electronic Control Unit(ECU).

The electric motor pump supplies hydraulic pressure to all wheel brake calipers by operating the piston inside the pump.

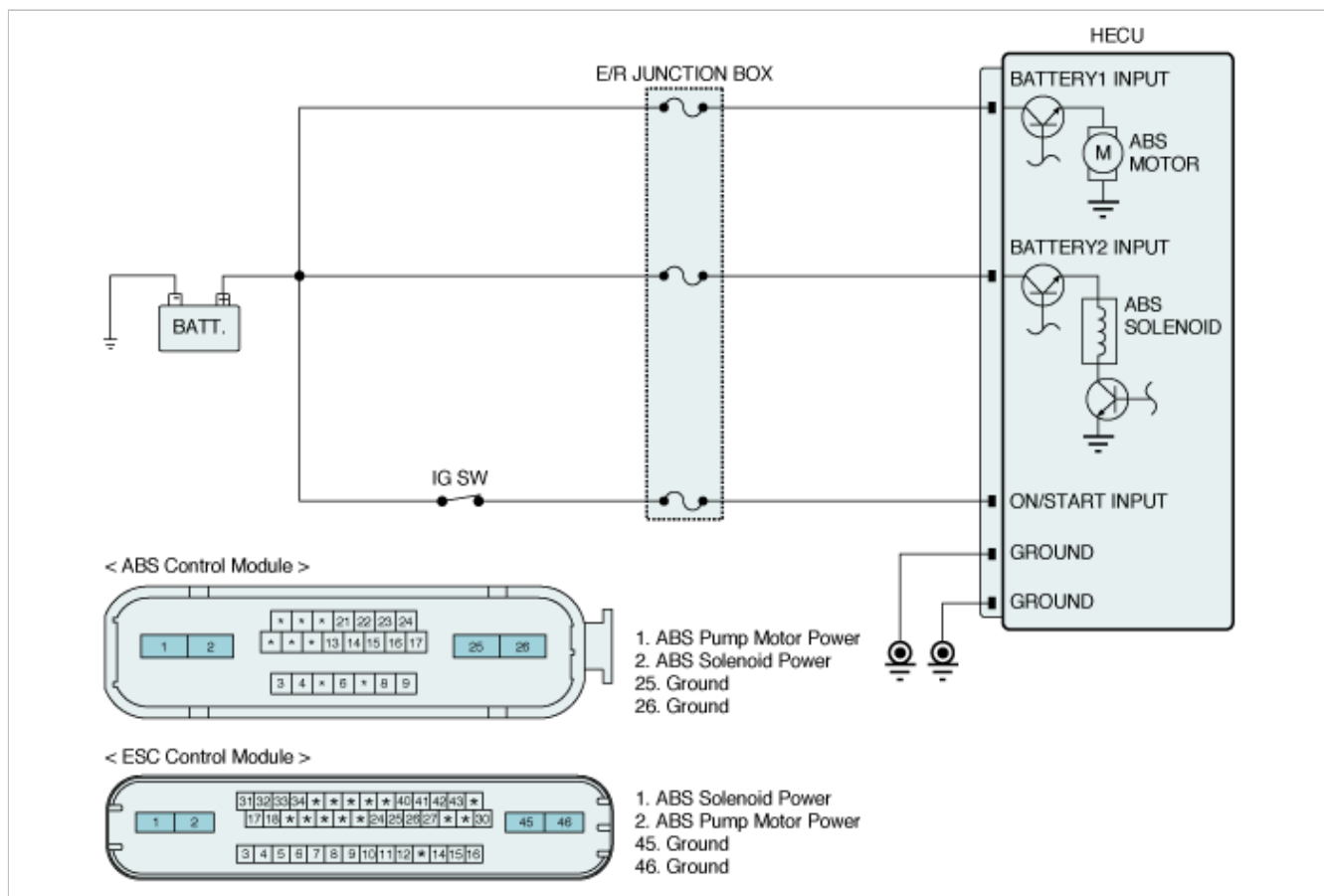
DTC Description

The ABS ECU monitors the pump motor relay or fuse open, open or short in motor or motor lock and then sets this code if a malfunction is detected.

DTC Detecting Condition

Item		Detecting Condition	Possible cause
DTC Strategy		• Battery Voltage Monitoring	<ul style="list-style-type: none"> • Open or short of power supply circuit • Blown fuse • Faulty HECU
Case1 (Motor Relay Open or Motor Short to GND)	Enable Conditions	• If the motor relay is switched ON and motor voltage < (IGN voltage – 4V±0.5V) continued for 49msec, the failure is detected.	
Case2 (Motor Lock)	Enable Conditions	• After motor relay is switched OFF, VMR is measured. If the time which VMR > 1±0.1V is less than evaluation time, recheck is performed again for a maximum of three times. When VMR is not normal even on the third recheck, the controller recognizes it as failure.	
Case3 (Motor Open, Motor Short to BATT)	Enable Conditions	• After 1.8sec from the time that motor relay is switched OFF, VMR > 4±0.5V continued for 1.8sec, the failure is detected.	
Case4 (Motor Fuse Open)	Enable Conditions	• If the motor relay is switched OFF and VMRP (Motor power supply voltage) < 4±0.5V continued for 1sec, the failure is detected.	
Fail Safe		• ABS/ESC functions are inhibited, EBD function is allowed and the ABS/ESC warning lamps are activated.	

Diagnostic Circuit Diagram



Terminal and Connector Inspection

- Many malfunctions in the electrical system are caused by poor harness(es) and terminal condition. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
- Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
- Has a problem been found?

YES	► Repair as necessary and then go to "Verification of Vehicle Repair" procedure.
NO	► Go to "Power Circuit Inspection" procedure.

Power Circuit Inspection

■ Open or Short Check

- Ignition "ON" & Engine "OFF".
- Measure voltage between power terminal of the HECU harness connector and chassis ground.

Specification : B+

- Is the measured value within specifications?

YES	► Go to "Ground Circuit Inspection" procedure.
NO	► Check for open or blown fuse referring to "Circuit Diagram". Repair open or short in power circuit between battery and HECU harness connector and then, go to "Verification of vehicle Repair" procedure.

Ground Circuit Inspection

■ Open or Short Check

1. Ignition "OFF" & Engine "OFF".
2. Disconnect the HECU connector.
3. Measure resistance between ground terminal of the HECU harness connector and chassis ground.

Specification : Approx. below 1Ω

4. Is the measured value within specifications?

YES	► Substitute with a known-good HECU and check for proper operation. If problem is corrected, replace HECU and then go to "Verification of Vehicle Repair" procedure.
NO	► Repair open or short in ground circuit between HECU harness connector and chassis ground, and then go to "Verification of vehicle Repair" procedure.

Verification of Vehicle Repair

After a repair, it is essential to verify that the fault has been corrected.

1. Connect scantool and select "Diagnostic Trouble Codes(DTCs)" mode.
2. Using a scantool, Clear DTC.
3. Operate the vehicle within DTC Detecting Condition in General Information. (Start and drive vehicle in gear and maintain vehicle speed at or above 12kmh. (7.5mph)
4. Using a scantool, Check DTC present.
5. Are any DTCs present ?

YES	► Go to the applicable troubleshooting procedure.
NO	► System performing to specification at this time.

**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > Yaw-rate and Lateral G Sensor > Description and Operation**

Description

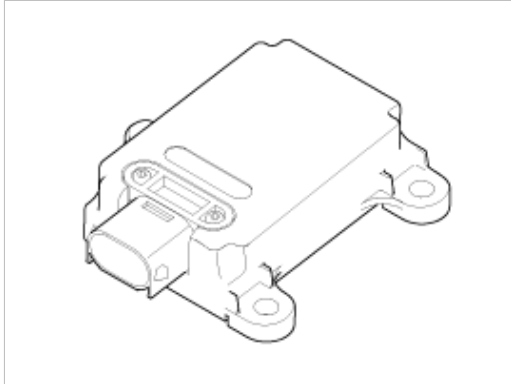
When the vehicle is turning with respect to a vertical axis the yaw rate sensor detects the yaw rate electronically by the vibration change of plate fork inside the yaw rate sensor.

If yaw velocity reaches the specific velocity after it detects the vehicle' yawing, the ESC control is reactivated.

The later G sensor senses vehicle's lateral G. A small element inside the sensor is attached to a deflectable lever arm by later G.

Direction and magnitude of lateral G loaded to vehicle can be known with electrostatic capacity changing according to lateral G.

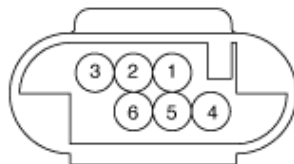
It interchanges signals with HECU through extra CAN line which only used for communication between HECU and sensor.



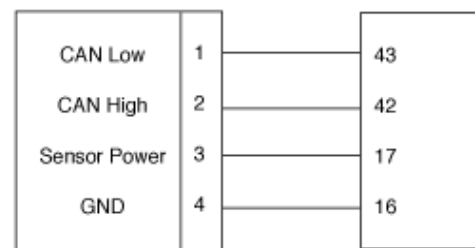
Specifications

Description		Specification	Remarks
Operating voltage		8 ~ 17V	
Output signal		CAN Interface	
Operating temperature		-40 ~ 85°C(-40 ~ 185°F)	
Yaw-rate sensor	Measurement range	-75 ~ 75°/sec	
	Frequency response	18 ~ 22Hz	
Lateral G sensor	Measurement range	-1.5 ~ 1.5g	
	Frequency response	50Hz±60%	

External Diagram



[Yaw-rate & Lateral G sensor's connector]



Yaw-rate &

Lateral G. sensor

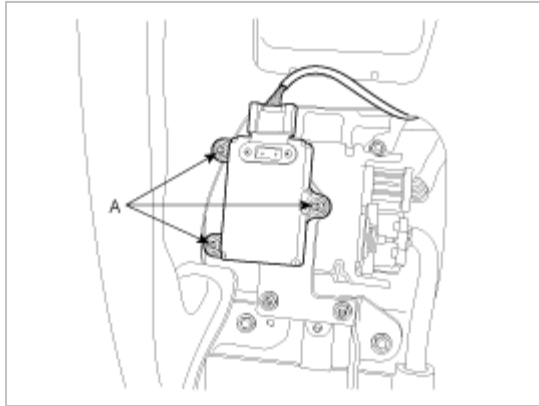
ESC HECU

Removal

1. Turn ignition switch OFF and disconnect the negative (-) battery cable.
2. Remove the floor console. (Refer to the Body group-console)
3. Disconnect the yaw rate & lateral G sensor connector.
4. Remove the mounting bolts (A).

Tightening torque:

7.9 ~ 10.8 N.m (0.8 ~ 1.1 kgf.m, 5.8 ~ 8.0 lb-ft)



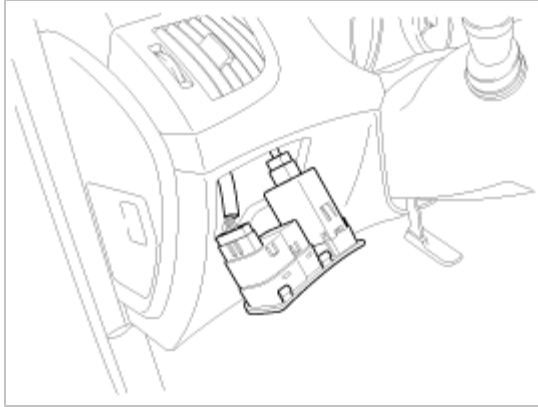
5. Installation is the reverse of removal.

Description

1. The ESC OFF switch is for the user to turn off the ESC system.
2. The ESC OFF lamp is on when ESC OFF switch is engaged.

Inspection

1. Turn ignition switch OFF and disconnect the negative (-) battery cable.
2. Remove the crash pad side cover. (Refer to the Body group-crash pad)
3. Remove the crash pad lower panel. (Refer to the Body group-crash pad)
4. Remove the lower crash pad switch assembly by using the scraper and then disconnect the connectors.



5. Check the continuity between the switch terminals as the ESC OFF switch is engaged.

Position	Terminal			
	1	4	2	5
ON	○	○	○	○
OFF			○	○

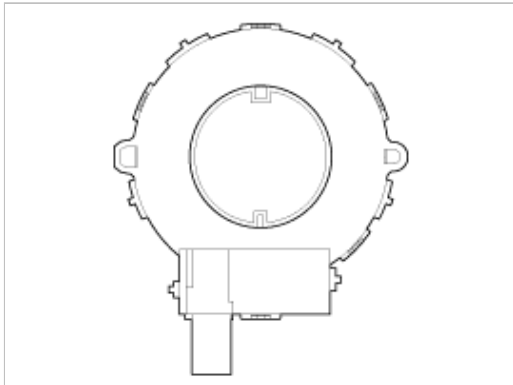
**GENESIS COUPE(BK) >2010 > G 2.0 DOHC > Brake System > ESC(Electronic Stability Control)
System > Steering Wheel Angle Sensor > Description and Operation**

Description

The steering angle sensor detects the angle of the steering wheel in order to which direction a user chooses. The sensor is detached on the MPS(Mutil-Function Switch) under the steering wheel.

Measureing principle

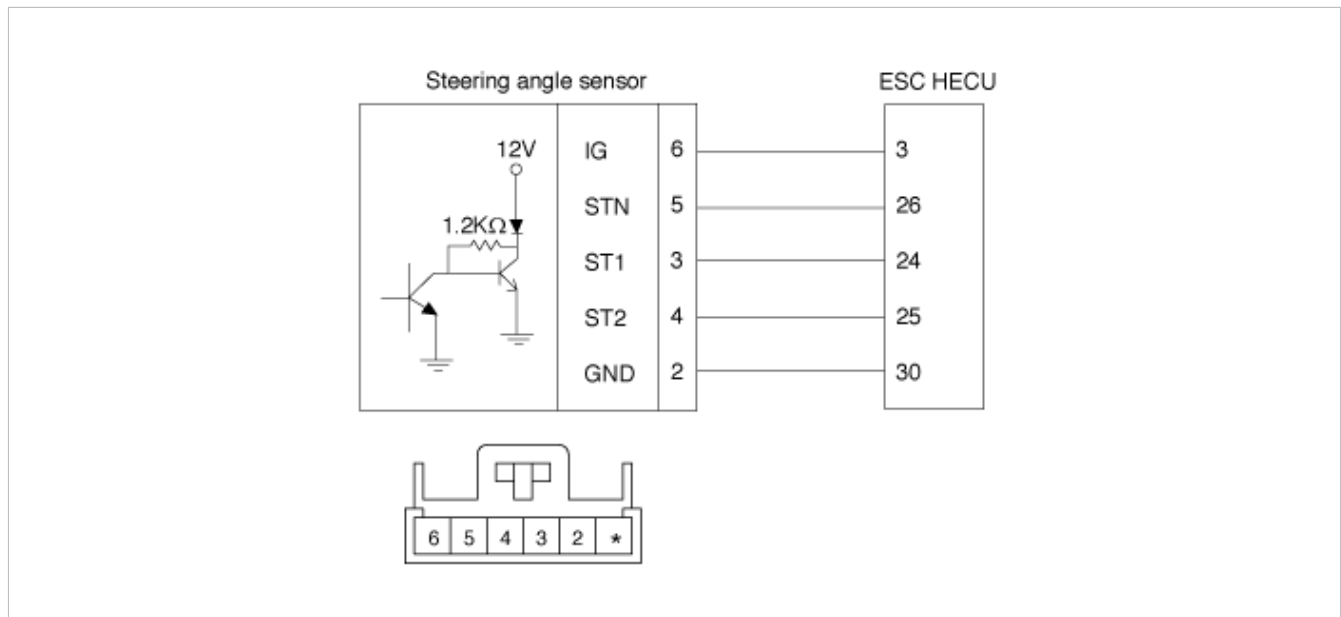
The split of the steering angle sensor detects a steering angle of the steering wheel by a ON/OFF pulse caused by whether or not the LED lights go through the hole of the split, rotating as the steering wheel revolves. There are three LEDs, two (ST1, ST2) for detecting a steering direction, and the other for the neutral position. The HECU calculates the steering angle by the pulse from the steering angle sensor.



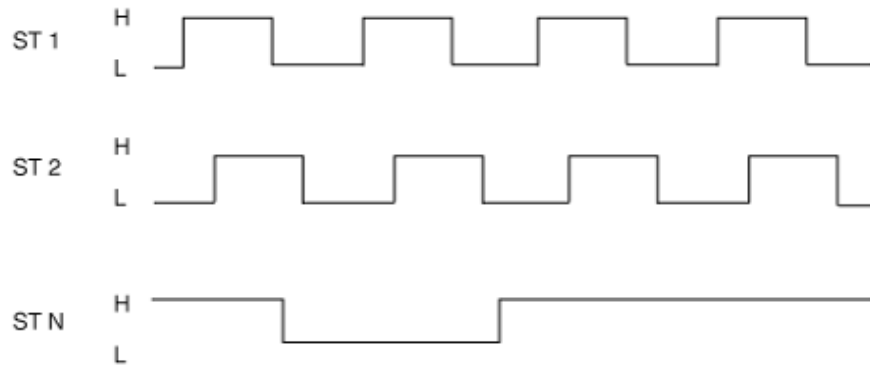
Specification

Description	Specification
Operating voltage	8 ~ 16 V
Operating temperature	-30 ~ 75 °C
Current consumption	Max.100 mA
Steering angle velocity	Max. ± 1500 °/sec

Circuit diagram(Steering wheel angle sensor)



Output characteristic



No.	Input		Output	Steering direction	Remark
1	ST1	L	L	Right	
	ST2	L	H		
	ST1	L	H	Left	
	ST2	L	L		
2	ST1	L	L	Left	
	ST1	H	L		
	ST1	L	H	Right	
	ST2	H	H		
3	ST1	H	H	Left	
	ST2	L	H		
	ST1	H	L	Right	
	ST2	L	L		
4	ST1	H	H	Right	
	ST2	H	L		
	ST1	H	L	Left	
	ST2	H	H		