

BRAKE

0000-00

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BRAKE

DIAGNOSIS

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BRAKE**0000-00****DIAGNOSIS****1. BRAKE**

Fault code	Defects	Application			Service hint
		ABS	ABD	ASR	
01	No defects	0	0	0	-
02	ECU	0	0	0	Internal fault of ECU. Replace the ECU.
03	Front/left speed sensor (defective wiring)	0	0	0	1. Check resistance between wiring harness and wheel speed sensor : 1.280KW - 1.920KW. 2. Check for wire ground and B+ OPEN. 3. If there is no defect on above, replace sensor.
04	Front/right speed sensor (defective wiring)	0	0	0	1. Check resistance between wiring harness and wheel speed sensor : 1.280KW - 1.920KW. 2. Check for wire ground and B+ OPEN. 3. If there is no defect on above, replace sensor.
05	Rear/left speed sensor (defective wiring)	0	0	0	1. Check resistance between wiring harness and wheel speed sensor : 1.280KW - 1.920KW. 2. Check for wire ground and B+ OPEN. 3. If there is no defect on above, replace sensor.
06	Rear/right speed sensor (defective wiring)	0	0	0	1. Check resistance between wiring harness and wheel speed sensor : 1.280KW - 1.920KW. 2. Check for wire ground and B+ OPEN. 3. If there is no defect on above, replace sensor.
07	Front/left speed sensor (defective wiring)	0	0	0	1. Check that connector pin arrangement on the relevant wire is correct. 2. Check for wire ground and B+ open. 3. Check air gap between wheel rotor and wheel speed sensor : 0.377 - 1.229 mm. 4. Check proper contact of wheel speed sensor connector and ECU connector. 5. Check sensor output voltage while shaking wiring harness by turning wheel 1/2 to 1 revolution per second (Voltage should be over 70mV when checked by multimeter and over 120mV/P-P when checked by oscilloscope). 6. If there is no defect on above, replace sensor.
08	Front/right speed sensor (abnormal signal)	0	0	0	1. Check that connector pin arrangement on the relevant wire is correct. 2. Check for wire ground and B+ open. 3. Check air gap between wheel rotor and wheel speed sensor : 0.377 - 1.229 mm. 4. Check proper contact of wheel speed sensor connector and ECU connector. 5. Check sensor output voltage while shaking wiring harness by turning wheel 1/2 to 1 revolution per second (Voltage should be over 70mV when checked by multimeter and over 120mV/P-P when checked by oscilloscope). 6. If there is no defect on above, replace sensor.
09	Rear/left speed sensor (abnormal signal)	0	0	0	1. Check that connector pin arrangement on the relevant wire is correct. 2. Check for wire ground and B+ open. 3. Check air gap between wheel rotor and wheel speed sensor : 0.369 - 1.213 mm. 4. Check proper contact of wheel speed sensor connector and ECU connector. 5. Check sensor output voltage while shaking wiring harness by turning wheel 1/2 to 1 revolution per second (Voltage should be over 70mV when checked by multimeter and over 120mV/P-P when checked by oscilloscope). 6. If there is no defect on above, replace sensor.

Modification basis	
Application basis	
Affected VIN	

BRAKE

KYRON 2010.01

ECU-
GASOLINECU-
DIESEL

BRAKE

AIR-BAG

CCCS

FATC

FFH

P/TRUNK

RAIN
SENSOR

STICS

TC

TCU

TGS
LEVER

Fault code	Defects	Application			Service hint
		ABS	ABD	ASR	
10	Rear/right speed sensor (abnormal signal)	0	0	0	1. Check that connector pin arrangement on the relevant wire is correct. 2. Check for wire ground and B+ open. 3. Check air gap between wheel rotor and wheel speed sensor : 0.369 - 1.213mm 4. Check proper contact of wheel speed sensor connector and ECU connector. 5. Check sensor output voltage while shaking wiring harness by turning wheel 1/2 to 1 revolution per second (Voltage should be over 70mV when checked by multimeter and over 120mV/P-P when checked by oscilloscope). 6. If there is no defect on above, replace sensor.
11	Wheel rotor teeth	0	0	0	1. This code will appear if a wheel rotor teeth of four wheels is defective. 2. Check the teeth number of wheel rotor and condition.
13	Front/left inlet valve	0	0	0	1. If this code appear together with the items related with valve relay failure, check the items related with valve failure first and repair defective causes. 2. Check each valve using a over-riding function of tester on sole noid valve diagnosis function. 3. Replace hydraulic modulator.
14	Front/left outlet valve	0	0	0	↑
15	Front/right inlet valve	0	0	0	↑
16	Front/right outlet valve	0	0	0	↑
17	Rear/left inlet valve	-	0	0	↑
18	Rear/left outlet valve	-	0	0	↑
19	Rear/right inlet valve	-	0	0	↑
20	Rear/right outlet valve	-	0	0	↑
17	Rear axle inlet valve	0	-	-	↑
18	Rear axle outlet valve	0	-	-	↑
21	Switching valve	-	0	0	1. If this code appear together with the items related with valve relay failure, check the items related with valve failure first and repair defective causes. 2. Check each valve using a over-riding function of tester on sole noid valve diagnosis function. 3. Check contact of ECU and hydraulic modulator connectors and terminals. 4. Check terminals for open or short (When connector is removed). 5. Replace hydraulic modulator if there is no defect on above.

Fault code	Defects	Application			Service hint
		ABS	ABD	ASR	
22	Shut-off valve	-	0	0	1. If this code appear together with the items related with valve relay failure, check the items related with valve failure first and repair defective causes. 2. Check each valve using a over-riding function of tester on solenoid valve diagnosis function. 3. Check contact of ECU and hydraulic modulator connectors and terminals. 4. Check terminals for open or short (When connector is removed). 5. Replace hydraulic modulator if there is no defect on above.
24	Motor relay/ return pump	0	0	0	1. Check using a over-riding function of tester on pump motor diagnosis function 2. Check resistance between pump motor ground terminal and battery negative terminal : less than 15mW. 3. Check body ground point. 4. Check relay coil internal resistance:40-80W. 5. Replace hydraulic modulator if there is no defect on above.
27	Stop lamp switch	0	0	0	1. Check using stop lamp switch diagnosis function from sensor value output function of tester. 2. Check contact of stop lamp switch terminals on ECU connector. 3. Check other wires for open and short (more than 80% of ECU supply voltage). 4. Check stop lamp switch function and replace if defective (when switch knob (plunger) is pressed by 3mm, resistance between each switch end will be infinite and if not pressed, it will be less than 200mW). 5. Voltage on No.11 when brake pedal is depressed : 11-14V Voltage on No.4 when brake pedal is released : 11-14V
28	Battery voltage low	0	0	0	1. Check battery voltage. 2. Check resistance between relevant voltage terminal of connector and each battery terminal (positive & negative). 3. Check that normal voltage is applied on each pin on connector when ignition switch is turned 'ON' or 'OFF'. 4. Check 10A and 60A fuses for ABS. 5. Replace hydraulic modulator if there is no defect on above.
30	CAN signal (TCU)	-	-	0	1. Check related CAN line for open, short. 2. Check poor contact of related CAN connector. 3. ECU is defective, replace ECU .
31	EMS (Engine)	-	-	0	1. Check related CAN line for open, short. 2. Check poor contact of related CAN connector. 3. ECU is defective, replace ECU . 4. Check EMS using special tool of self-diagnosing.
33	CAN communication	-	-	0	1. Check related CAN line for open, short. 2. Check poor contact of related CAN connector. 3. ECU is defective, replace ECU .
34	Brake over heating	0	0	0	

Modification basis	
Application basis	
Affected VIN	

Function	Defective Components	Trouble Code	Descriptions	System	
Sensor Monitoring	Front LH Wheel speed sensor	C1011 (5011) C1012 (5012)	Wheel speed sensor front left-electrical Wheel speed sensor front left-other	ABS	ESP
	1. C1011 (5011) <u>Cause</u> - Defective front LH wheel speed sensor - Short or poor contact wire to sensor <u>Action</u> - Check the wheel speed sensor connector - Check HECU connector - Check the harness connection 2. C1012 (5012) <u>Cause</u> - Defective front LH wheel speed sensor - No signals from wheel speed sensor and tooth wheel - Too large air gap between wheel speed sensor and tooth wheel - Different number of teeth in tooth wheel <u>Action</u> - Check the wheel speed sensor connector - Check HECU connector - Check air gap and tooth wheel mounting (Specified air gap: 0.335 ~ 0.945 mm) - Check the number of teeth (48) in tooth wheel			O	O
	Front RH Wheel speed sensor	C1021 (5021) C1022 (5022)	Wheel speed sensor front right-electrical Wheel speed sensor front right-other		
	1.C1021 (5021) <u>Cause</u> - Defective front RH wheel speed sensor - Short or poor contact wire to sensor <u>Action</u> - Check the wheel speed sensor connector - Check HECU connector - Check the harness connection 2.C1022 (5022) <u>Cause</u> - Defective front RH wheel speed sensor - No signals from wheel speed sensor and tooth wheel - Too large air gap between wheel speed sensor and tooth wheel - Different number of teeth in tooth wheel <u>Action</u> - Check the wheel speed sensor connector and HECU connector - Check air gap and tooth wheel mounting (Specified air gap: 0.335 ~ 0.945 mm) - Check the number of teeth (48) in tooth wheel			O	O

Function	Defective Components	Trouble Code	Descriptions	System	
Sensor Monitoring	Rear RH Wheel speed sensor	C1031 (5031) C1032 (5032)	Wheel speed sensor rear left-electrical Wheel speed sensor rear left-other	ABS	ESP
	1. C1031 (5031) <u>Cause</u> - Defective rear RH wheel speed sensor - Short or poor contact wire to sensor <u>Action</u> - Check the wheel speed sensor connector - Check the HECU connector - Check the harness connection				
	2. C1032 (5032) <u>Cause</u> - Defective rear RH wheel speed sensor - No signals from wheel speed sensor and tooth wheel - Too large air gap between wheel speed sensor and tooth wheel - Different number of teeth in tooth wheel <u>Action</u> - Check the wheel speed sensor connector - Check the HECU connector - Check air gap and tooth wheel mounting (Specified air gap: 0.309 ~ 0.958 mm) - Check the number of teeth (48) in tooth wheel			O	O
	Rear LH Wheel speed sensor	C1041 (5041) C1042 (5042)	Wheel speed sensor rear left-electrical Wheel speed sensor rear left-other		
	1. C1041 (5041) <u>Cause</u> - Defective rear LH wheel speed sensor - Short or poor contact wire to sensor <u>Action</u> - Check the wheel speed sensor connector - Check the HECU connector - Check the harness connection				
	2. C1042 (5042) <u>Cause</u> - Defective rear LH wheel speed sensor - No signals from wheel speed sensor and tooth wheel - Too large air gap between wheel speed sensor and tooth wheel - Different number of teeth in tooth wheel <u>Action</u> - Check the wheel speed sensor connector and HECU connector - Check air gap and tooth wheel mounting (Specified air gap: 0.309 ~ 0.958 mm) - Check the number of teeth (48) in tooth wheel			O	O

Modification basis	
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Affected VIN	

Function	Defective Components	Trouble Code	Descriptions	System	
Sensor Monitoring	Pressure sensor	C1051 (5051)	Defective input sensor	ABS	ESP
	Cause - Abnormal signals from pressure sensor - Defective pressure sensor or harness Action - Check the pressure sensor connector			X	O
	Steering wheel angle sensor	C1061 (5061)	Defective steering wheel angle sensor		
	Cause - Internally defective steering wheel angle sensor - Abnormal signals from steering wheel angle sensor - Short circuit between supplying voltage output and ground - Abnormal signal voltage from steering wheel angle sensor - Poor installation of steering wheel angle sensor and abnormal signal Action - Check the supplying voltage: (Specified voltage: 9 ~ 16 V) - Check the output voltage: Check voltage between ESP unit terminals with ignition ON • ST1 voltage check: between ESP unit terminal No. 5 and ground (Specified voltage: 1.3 ~ 4.1V) • ST2 voltage check: between ESP unit terminal No. 2 and ground (Specified voltage: 1.3 ~ 4.1V) • STN voltage check: between ESP unit terminal No.12 and ground (Specified voltage: 1.3 ~ 4.1V)			X	O
	Sensor cluster	C1073 (5073) C1074 (5074)	Sensor cluster -electrical Sensor cluster-internal		
	1. C1073 (5073) Cause - Operating voltage exceeds specified range (Hi: 18.0 ± 1.0 V / Lo: 6.5 ± 0.5 V) - Poor contact or installation of harness Action - Check the sensor cluster connector - Replace the sensor cluster 2. C1074 (5074) Cause - Internally defective HECU - Abnormal A/D converter voltage: 5.0 ± 3 % - Abnormal supplying voltage (4.580 ~ 4.960 V) to sensor cluster → Short circuit between supplying voltage output of sensor cluster and ground - Poor ground of sensor cluster (0.0 ~ 0.5 V) → Short to ground on sensor cluster - Abnormal signals from lateral acceleration sensor - Abnormal signals from yawing sensor - Poor installation of sensor - Defective sensor cluster - Defective or short circuit of CAN communication line Action - Replace the sensor			X	O

Function	Defective Components	Trouble Code	Descriptions	System	
Battery Voltage Monitoring	Battery	C1101 (5101) C1102 (5102)	Battery under voltage Battery over voltage	ABS	ESP
	1. C1101 (5101) <u>Cause</u> - Low voltage out of specified range (9.7 ± 0.3 V) <u>Action</u> - Check the supplying voltage 2. C1102 (5102) <u>Cause</u> - Over voltage out of specified range (18.0 ± 1.0 V) <u>Action</u> - Check the supplying voltage			O	O
Brake Monitoring	Brake disc	C1111 (5111)	Disk temperature is high		
	<u>Cause</u> - Overheated brake disk due to braking force: over 500°C <u>Action</u> - Stop driving for a period of time after turning off the ESP			X	O
	Brake lamp switch ESP OFF switch	C1201 (5201) C1202 (5202)	Defective brake lamp switch Defective ESP OFF switch		
	1. C1201 (5201) <u>Cause</u> - Mechanical defective in brake switch - Defective brake switch harness <u>Action</u> - Check the harness and connector 2. C1202 (5202) <u>Cause</u> - Mechanical defective in ESP OFF switch - Defective ESP OFF switch harness (short to ground) <u>Action</u> - Check the harness and connector for ESP OFF switch			X	O
Valve Monitoring	Valve, valve relay	C1301 (5301)	Defective valve, valve relay in HECU		
	<u>Cause</u> - Abnormal supplying voltage to valve solenoid - Internally defective HECU <u>Action</u> - Replace the HECU - Check the battery voltage - Check the HECU connector			O	O

Modification basis	
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Function	Defective Components	Trouble Code	Descriptions	System	
Pump Monitoring	Motor pump	C1302 (5302)	Defective motor pump	ABS	ESP
	<u>Cause</u> - Too low (below 6.0 V) or no supplying voltage to pump motor - Over 0.93 V from pump motor voltage - Poor contact in pump motor connector - Poor ground <u>Action</u> - Check the supplying voltage - Check the HECU connector - Replace the HECU			0	0
HECU and Sensor Monitoring	HECU	C1401 (5401)	HECU hardware		
	<u>Cause</u> - Internally defective HECU - Defective A/D converter, internal voltage regulator, and controller - Defective sensor and short to supplying voltage line - Abnormal temperature sensor signal <u>Action</u> - Replace the HECU			0	0
	Sensor initialization	C1501 (5501)	Abnormal sensor initialization		
	<u>Cause</u> - Abnormal signals from sensors - Abnormal sensor data <u>Action</u> - Check the sensors - Initialize the sensors			0	0
	Vehicle coding	C1170 (5170)	Variant coding error, or misinstallation HECU		
	<u>Cause</u> - Discrepancy between HECU coding and vehicle coding - Defective CAN communication line - Misinstallation HECU <u>Action</u> - Check the HECU coding and vehicle coding - Perform vehicle coding - Replace the exact HECU - Check engine ECU variant coding			(0)	0

Function	Defective Components	Trouble Code	Descriptions	System	
	CAN communication	C1601 (5601)	CAN communication error	ABS	ESP
	Cause - Short or open to CAN communication line - Poor connection of CAN communication line Action - Check the CAN communication line - Check the HECU connector			(O)	O
	CAN communication	C1602 (5602) C1603 (5603) C1604 (5604) C1605 (5605)	Communication error between engine ECU and HECU Communication error between TCU and HECU Communication error between TCCU (4WD) and HECU Communication error between cluster (Meter) and HECU		
	1. C1602 (5602) Cause - Short to CAN communication line - Overload to CAN communication Action Action - Check the engine ECU - Check the CAN communication line - Check the engine ECU connector 2. C1603 (5603) Cause - Short to CAN communication line - Overload to CAN communication Action Action - Check the TCU - Check the CAN communication line - Check the TCU connector 3. C1604 (5604) Cause - Short to CAN communication line - Overload to CAN communication Action Action - Check the TCCU - Check the CAN communication line - Check the TCCU connector 4. C1605 (5605) Cause - Short to CAN communication line - Overload to CAN communication Action Action - Check the cluster (meter) - Check the CAN communication line - Check the cluster (meter) connector			X	O

Modification basis	
Application basis	
Affected VIN	

Function	Defective Components	Trouble Code	Descriptions	System	
CAN Communica- tion Monitoring	CAN signal error EMS	C1612 (5612)	Signal from engine ECU is abnormal	ABS	ESP
	<u>Cause</u> - Engine ECU is defective - Signal from engine ECU error <u>Action</u> - Check engine ECU - Check ECU S/W version			X	O