

## 2002 ENGINE PERFORMANCE

### Pin Voltage Charts

## INTRODUCTION

Pin voltage charts are supplied to reduce diagnostic time. By checking pin voltages at the Engine Control Module (ECM), it is possible to determine if the ECM is receiving and transmitting proper voltage signals. Charts may also help determine if ECM harness has shorts or opens. Before performing pin voltage tests, ensure engine mechanical condition has been thoroughly inspected and self-diagnostics has been attempted. Technical Service Bulletins (TSBs) may also be helpful in correcting a hard to diagnose problem.

## ENGINE CONTROL MODULE LOCATION







### ENGINE CONTROL MODULE LOCATION

Application	Location
Optima	Forward Of Center Console, Under Dash
Rio	Under Left Front Kick Trim Panel
Sedona, Spectra & Sportage	Under Right Front Passenger Floorboard




## ECM CONNECTOR TERMINAL IDENTIFICATION

For ECM connector terminal identification, see **Fig. 1 -Fig. 7** .

**CAUTION:** When battery is disconnected, vehicle computer and memory system may lose memory data. Driveability problems may exist until computer system have completed a relearn cycle. See COMPUTER RELEARN PROCEDURES article in GENERAL INFORMATION before disconnecting battery.

8 BLU	7 *		6 LT BLU	5 *					4 *	3 PNK		2 GRY	1 BLK	
23 YEL/BLK	22 BRN/WHT	21 GRN/WHT	20 GRN/WHT	19 *	18 GRN	17 YEL	16 *	15 *	14 BLU	13 *	12 ORG	11 WHT	10 *	9 LT GRN/BLK
35 WHT	34 GRN/WHT		33 *	32 *	31 *	30 *		29 *	28 ORG/BLK	27 *	26 BLK		25 *	24 PNK/BLK






CONNECTOR "A"

6LTBLU/ BLK	5YEL	4GRN					3WHT	2BLK	1PNK	
17BLK/ WHT	16BLK	15BRN	14PNK	13★	12ORG/ BLK	11★	10GRY	9TAN	8BLK	7PNK
26ORG	25★	24TAN		23★	22RED	21BRN	20★		19★	18YEL

CONNECTOR "B"

7 RED	6 BLK/ WHT	5 WHT						4 *	3 TAN	2 *	1 TAN
19 RED	18 BLK/ WHT	17 *	16 *	15 GRN	14 *	13 WHT	12 *	11 *	10 BRN	9 *	8 BLU
28 PNK	27 BLK/ WHT		26 *	25 *		24 *	23 *	22 VIO		21 *	20 BLU

CONNECTOR "C"

7 ORG/BLK	6RED/BLK	5 *						4 WHT	3 WHT		2 PNK	1 BLU
20LTBLU/BLK	19 *	18 *	17 *	16 *	15 *	14 *	13 YEL	12 *	11 *	10BLK/WHT	9 GRY	8 LTGRN
30 YEL/WHT	29 VIO		28 *	27 *	26 RED		25 *	24 GRY		23LTBLU	22 YEL	21 YEL

CONNECTOR "D"

OPTIMA 2.4L A/T B01 ENGINE/TRANSAXLE CONTROL MODULE

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**Fig. 1: Identifying Engine Control Module Connectors & Terminals (Optima 2.4L A/T)**  
Courtesy of KIA MOTORS AMERICA, INC.

13 BLK	12 PNK	11 *	10 WHT	9 GRN/WHT	8 GRN/WHT	7 *	6 LT BLU	5 *	4 BLU	3 *	2 PNK/BLK	1 BLK
26 BLK	25 PNK	24 *	23 ORG	22 GRN/WHT	21 GRN	20 YEL	19 *	18 *	17 ORG/BLK	16 *	15 GRY	14 LT GRN/BLK

CONNECTOR "A"

8 TAN	7 ORG/BLK	6 BRN/WHT	5 *	4 BLU	3 BLU	2 *	1 *
16 *	15 WHT	14 *	13 *	12 RED	11 PNK	10 *	9 *

CONNECTOR "B"

6 *	5 WHT	4 BLK	3 *	2 YEL/BLK	1 *
12 GRN	11 VIO	10 PNK	9 *	8 WHT	7 *

CONNECTOR "C"

11 LT BLU/BLK	10 ORG	9 YEL	8 BLU	7 *	6 TAN	5 TAN	4 *	3 BRN	2 TAN	1 YEL
22 BLK/WHT	21 BLK	20 *	19 YEL	18 BLK	17 *	16 BRN	15 BRN	14 BLU	13 GRN	12 PNK

CONNECTOR "D"

OPTIMA 2.4L M/T B01 ENGINE CONTROL MODULE

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**Fig. 2: Identifying Engine Control Module Connectors & Terminals (Optima 2.4L M/T)**

Courtesy of KIA MOTORS AMERICA, INC.

40 YEL	39 ★ (LT BLU)	38 ★ (YEL)	37 TAN/BLK TAN/BLK	36 ORG/BLK ORG/BLK	35 ★	34 VIO	33 ★	32 ★	31 ★
30 ★	29 GRN/ WHT	28 ★	27 ★	26 ★	25 RED	24 LT GRN	23 WHT	22 ★ (WHT)	21 ★
20 BRN/ WHT	19 ★	18 GRN	17 WHT	16 ★	15 BLK/ WHT	14 BLK/ WHT	13 ★	12 ★	11 ★
10 GRN/ WHT	9 ★	8 BLK/ WHT	7 BLK	6 ★	5 VIO	4 LT BLU/ BLK	3 ★	2 ★	1 ★

CONNECTOR "F"

52 ★	51 ★	50 ★	49 ★	48 BLK	47 ORG/ BLK	46 BLU	45 ★	44 ★	43 ★	42 GRN/ WHT	41 ★	40 ★
39 ★	38 YEL/ WHT	37 BLK/ WHT	36 GRY	35 PNK/ BLK	34 LTGRN/ BLK	33 BLK	32 GRN	31 WHT	30 YEL	29 BRN	28 ★	27 ★
26 ORG/ BLK	25 BLK/ WHT	24 GRN	23 BLK/ WHT	22 TAN	21 BLK/ WHT	20 BLK/ WHT	19 BLU	18 ★	17 BLK/ WHT	16 ★	15 ★	14 ★
13 ★	12 ★	11 ★	10 GRN/ WHT	9 ★	8 YEL	7 ★	6 ★	5 ★	4 ★	3 ★	2 ★	1 YEL

CONNECTOR "M"

24 TAN/ WHT	23 BLU	22 TAN	21 TAN/ WHT	20 TAN	19 PNK
18 VIO/ WHT	17 ★	16 VIO	15 YEL	14 VIO	13 PNK
12 ★	11 ★	10 ★	9 ★	8 ★	7 PNK
6 ★	5 ★	4 ★	3 ★	2 ★	1 PNK

CONNECTOR "P"

9 PNK	8 PNK	7 ORG
6 BLK	5 BLK	4 BLK
3 GRN	2 ★	1 PNK

CONNECTOR "V"

9 ★	8 ★	7 ★
6 ★	5 BLK/ BLK	4 ★
3 YEL	2 WHT	1 BLK

CONNECTOR "Z"

OPTIMA 2.7L V6 B01 ENGINE CONTROL MODULE

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**Fig. 3: Identifying Engine Control Module Connectors & Terminals (Optima 2.7L)**  
Courtesy of KIA MOTORS AMERICA, INC.

9	RED/ YEL	8	RED/ YEL	7	GRN/ WHT
6	BLK/ BLU	5	BLK/ BLU	4	BLK/ BLU
3	BLU/ RED	2	★	1	WHT

B01

24	★	23	★	22	★	21	★	20	RED	19	GRN/ RED
18	LTGRN/ YEL	17	LTGRN/ RED	16	★	15	WHT	14	★	13	★
12	LTGRN/ RED	11	LTGRN/ YEL	10	★	9	BRN	8	★	7	★
6	★	5	★	4	★	3	★	2	★	1	★

B02

52	★	51	★	50	BRN	49	BRN/ RED	48	RED	47	GRN/ BLK	46	BLK	45	★	44	WHT/ RED	43	WHT	42	WHT/ BLU	41	★	40	GRN
39	★	38	★	37	★	36	GRN/ BLU	35	YEL/ GRN	34	★	33	RED	32	★	31	BRN/ RED	30	★	29	★	28	<YEL/ RED>	27	<YEL/ BLU>
26	★	25	★	24	★	23	YEL	22	YEL/ BLU	21	★	20	BLU	19	★	18	★	17	★	16	BLU	15	BLU/ GRN	14	★
13	★	12	★	11	★	10	★	9	★	8	★	7	★	6	★	5	★	4	★	3	★	2	★	1	★

B03

40	★	39	★	38	★	37	BLU/ YEL	36	BLU/ GRN	35	BRN/ RED	34	RED/ GRN	33	GRN/ BLK	32	★	31	★
30	<RED/ WHT>	29	<RED/ YEL>	28	★	27	★	26	YEL/ RED	25	WHT/ BLU	24	BRN/ YEL	23	WHT/ RED	22	★	21	★
20	WHT	19	★	18	RED/ BLK	17	BLU/ ORG	16	★	15	BLU/ YEL	14	★	13	★	12	★	11	BLU/ RED
10	GRN	9	★	8	YEL	7	WHT/ GRN	6	★	5	GRN/ ORG	4	★	3	★	2	★	1	RED

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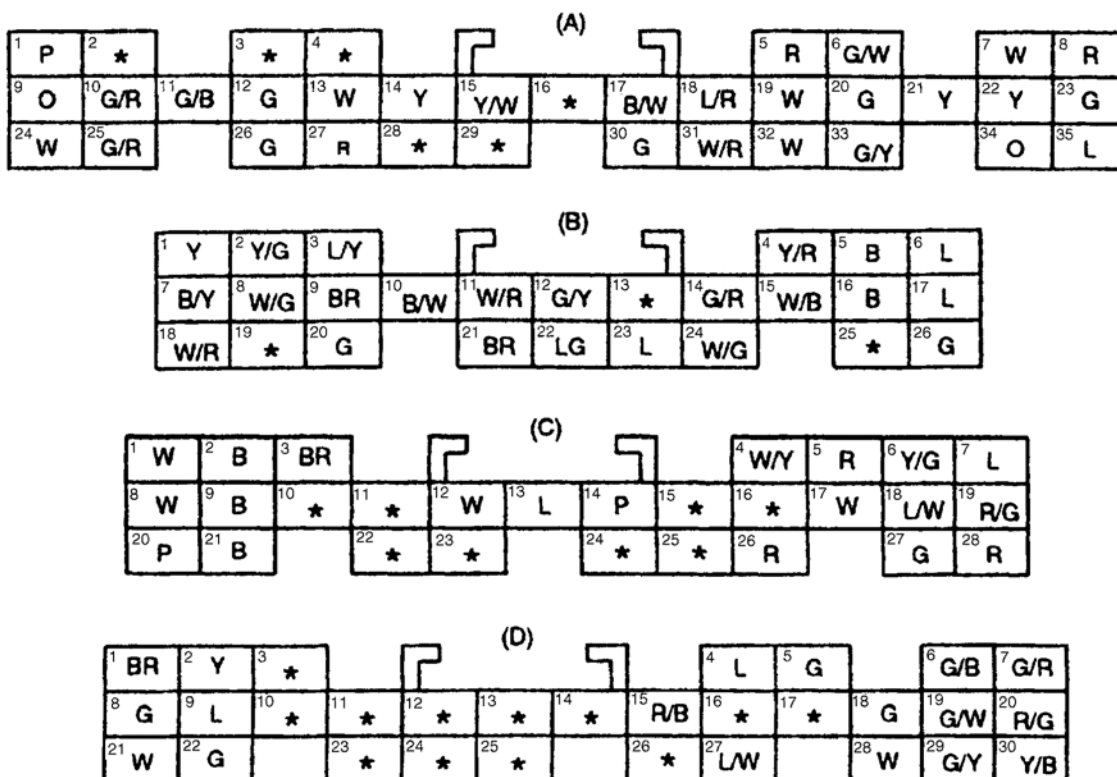
9	★	8	★	7	★
6	RED/ RED	5	★	4	YEL/BLU YEL/BLU
3	★	2	★	1	★

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# ENGINE CONTROL MODULE

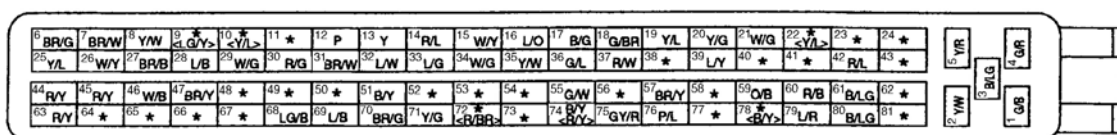
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**Fig. 4: Identifying Engine Control Module Connectors & Terminals (Rio 1.5L)**  
**Courtesy of KIA MOTORS AMERICA, INC.**



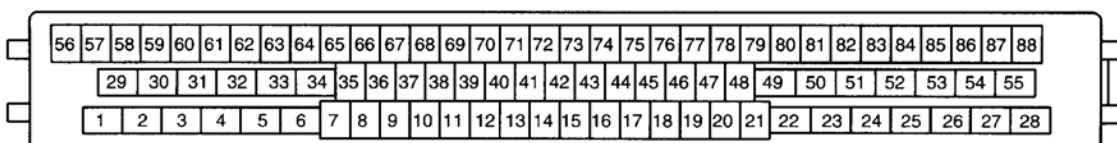
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**Fig. 5: Identifying Engine Control Module Connector & Terminals (Sedona 3.5L)**  
Courtesy of KIA MOTORS AMERICA, INC.



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**Fig. 6: Identifying Engine Control Module Connector & Terminals (Spectra 1.8L)**  
Courtesy of KIA MOTORS AMERICA, INC.



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**Fig. 7: Identifying Engine Control Module Connector & Terminals (Sportage 2.0L)**  
Courtesy of KIA MOTORS AMERICA, INC.

## PIN VOLTAGE CHARTS

Pin voltage charts are charts provided from manufacturer. For Optima, Sedona and Spectra, pin voltage charts are not available. For additional terminal and wire color identification at Engine Control Module (ECM), see appropriate wiring diagram in WIRING DIAGRAMS article.

**NOTE:** Unless stated otherwise in testing procedures, perform all voltage tests using a Digital Volt-Ohmmeter (DVOM) with a minimum 10-megohm input impedance. Voltage readings may vary slightly due to battery condition or charging rate.

Terminal	Signal	Connected to	Test condition	Voltage
9	Power input	Ignition switch	Key ON	B+
8	Power input	Ignition switch	Key ON	B+
1	Ignition input	Ignition switch	Key ON	B+
4	Ground	Ground	Constant	<0.5V
6	Ground	Ground	Constant	<0.5V
5	Ground	Ground	Constant	<0.5V
3	Diagnosis K-line	Data link connector	—	—
7	Power	Battery	Constant	B+

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Terminal	Signal	Connected to	Test condition	Voltage
20	Canister close valve control	Canister close valve	Non-operation	B+
			Operation	<1V
18	Wheel speed sensor input	Wheel speed sensor	Wheel stop	0V or 5V
			Wheel rolling	1~2V (Wave)
12	Wheel speed sensor ground	Wheel speed sensor	Constant	<1V
9	Fuel tank pressure ground	Fuel tank	Constant	<1V
15	Fuel tank pressure input	Fuel tank	Key ON/ENG OFF	5V
			Idle	2~3V
17	HO2S down input	HO2S down	Key ON/ENG OFF	0.4V
			Idle	0~1V
11	HO2S down ground	HO2S down	Constant	B+
19	HO2S down heater	HO2S down	Key ON/ENG OFF	B+
			Idle	6~8V (duty 48~52%)

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**Fig. 8: ECM Pin Voltage Chart (Rio - 1 Of 3)**  
Courtesy of KIA MOTORS AMERICA, INC.

Terminal	Signal	Connected to	Test condition	Voltage
47	Fuel injection valve control	Fuel injector No. 2	Key ON/ENG OFF	B+
			Idle	B+(duty)
48	Fuel injection valve control	Fuel injector No. 4	Key ON/ENG OFF	B+
			Idle	B+(duty)
49	Fuel injection valve control	Fuel injector No.1	Key ON/ENG OFF	B+
			Idle	B+(duty)
50	Fuel injection valve control	Fuel injector No. 3	Key ON/ENG OFF	B+
			Idle	B+(duty)
31	Engine RPM signal output	Instrument cluster	Key ON/ENG OFF	B+
			Idle	6-7V(duty 45-50%)
28	TPS signal output	Transaxle control module	Key ON(throttle valve close)	1-2V(duty 8-12%)
			Key ON (throttle valve open)	8-12V (duty 88-92%)
27	Torque signal output	Transaxle control module	Idle	1-2V(duty 8-12%)
15	TPS voltage	TPS	Key ON	B+
42	EVAP purge solenoid valve	EVAP purge solenoid valve	Key ON/ENG OFF	B+
			Idle	10-12V (duty)
44	ISC valve output control (closing)	ISC valve	Key ON/ENG OFF	6-7V(duty 42-52%)
			Idle	9-10V(duty 60-70%)
43	ISC valve output control (opening)	ISC valve	Key ON/ENG OFF	7-8V(duty 50-60%)
		ISC valve	Idle	4-6V (duty 30-40%)
20	Knock sensor shield	Knock sensor	Constant	<0.5V
33	Knock sensor ground	Knock sensor	Constant	<0.5V
46	Knock sensor input	Knock sensor	Key ON	2-3V
36	MAF sensor input	MAF sensor	Key ON	0.5V
			Idle	0.6-0.8V
23	MAF sensor ground	MAF sensor	Constant	<1V
			Idle	0-B+
35	HO2S up input	HO2S up	Key ON/ENG OFF	0.4V
			Idle	0-1V
22	HO2S up ground	HO2S up	Constant	<1V
40	HO2S up heater control	HO2S up	Key ON/ENG OFF	B+
			Idle	6-8V(duty 48-52%)
9	Power input	Ignition switch	Key ON	B+
16	Power output	Tank pressure sensor	Key ON	5V

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**Fig. 9: ECM Pin Voltage Chart (Rio - 2 Of 3)**  
**Courtesy of KIA MOTORS AMERICA, INC.**

Terminal	Signal	Connected to	Test condition	Voltage
33	Cooling fan relay control	cooling fan relay	Key ON/cooling fan non-operation	B+
			Key ON/cooling fan operation	<1V
36	A/C relay control	A/C relay	A/C non-operation	B+
			A/C operation	<1V
23	DPS signal input	DPS	A/C non-operation	B+
			A/C operation	<1V
24	A/C switch signal input	A/C switch	A/C switch ON	B+
			A/C switch OFF	<1V
25	Power steering switch input	Power steering switch	Key ON/switch operation	<1V
			Key ON/switch non-operation	B+
37	MIL control	MIL (instrument cluster)	Key ON/ENG OFF	<1V
			Idle (DTC non-present)	B+
			Idle (DTC present)	<1V
30	Park/Neutral signal input	Transaxle control module	Key ON (P/N range)	<1V
			Key ON (other range)	B+
26	Headlight switch signal input	Headlight switch	Key ON/switch HEAD	B+
			Key ON	<1V
34	Main relay control	Main relay	Key ON	<1V
			Key OFF	B+
17	TPS signal input	TPS	Key ON (throttle valve close)	0.2~0.8V
			Key ON (throttle valve open)	4.0~4.8
7	TPS ground	TPS	Constant	<1V
18	Camshaft position sensor signal input	Camshaft position sensor	Key ON/ENG OFF	0V or 5V
			Idle	2-3V (duty 40~50%)
8	Camshaft position sensor ground	Camshaft position sensor	Constant	<1V
11	Intake air temperature sensor signal input	Intake air temperature sensor	Key ON/ENG OFF (at 20 °C)	1-2V
1	Intake air temperature sensor ground	Intake air temperature sensor	Constant	<1V
35	Fuel pump relay control	Fuel pump	Key ON/ENG OFF	B+
			Idle	<1V
20	Crankshaft position sensor signal input	Crankshaft position sensor	Key ON/ENG OFF	<0.5V
			Idle	2-3V (duty 40~50%)
10	Crankshaft position sensor ground	Crankshaft position sensor	Constant	<1V
29	Torque reduction control	Transaxle control module	-	9-10V
15	Engine coolant temperature signal input	Engine coolant temperature	Key ON/ENG OFF (at 80 °C)	1-2V
5	Engine coolant temperature ground	Engine coolant temperature	Constant	<1V
27	TCU MIL signal input	Transaxle control module	-	0V or 5V
22	Vehicle speed sensor input	Vehicle speed sensor	Vehicle stop	0V/5V
			Vehicle rolling	2-3V
32	MISS CAP control	MISS CAP (instrument cluster)	Missing cap	1V

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Terminal	Signal	Connected to	Test condition	Voltage
4	Ignition coil control	Ignition coil (cylinder no. 1 & 4)	Key ON/ENG OFF	B+
			Idle	B+ (pulse)
6	Ignition coil control	Ignition coil (cylinder no 2 & 3)	Key ON/ENG OFF	B+
			Idle	B+ (pulse)

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**Fig. 10: ECM Pin Voltage Chart (Rio - 3 Of 3)**  
**Courtesy of KIA MOTORS AMERICA, INC.**



TERMINAL	SIGNAL	CONNECTED TO	TEST CONDITION	VOLTAGE
C211-1	Fuel pump relay control	Fuel pump relay	Key ON/Engine OFF	B+
			Idle	< 2.0 V
C211-2	Idle speed control – closing	Idle air control valve	Key ON/Engine OFF	3.3~3.6 V
			Idle	6.0 V
C211-3	Fuel injector control	Fuel injector #1	Key ON/Engine OFF	B+
			Idle	B+
C211-4	Fuel injector control	Fuel injector #4	Key ON/Engine OFF	B+
			Idle	B+
C211-5	—	—	—	—
C211-6	Injector ground	Ground	Constant	< 1.0 V
C211-7	—	—	—	—
C211-8	MIL control	Malfunction indicator light	Key ON/Engine OFF	< 1.0 V
			Idle (No DTC Found)	B+
C211-10	Rear HO2S sensor ground	Rear Heated Oxygen sensor	Key ON/Engine OFF	0.1 - 0.8 V
			Idle	0.3V
C211-11	Front HO2S sensor ground	Front heated oxygen sensor	Key ON/Engine OFF	0.1 - 0.8 V
			Idle	0.3 V
C211-12	Front HO2S input	Front heated oxygen sensor	Key ON/Engine OFF	Approx. 0.45 V
			Idle	0.1 - 0.9 V
C211-13	—	—	—	—
C211-14	Mass air flow sensor ground	Mass air flow sensor	Key ON/Engine OFF	0.01 V
			Idle	0.03 V
C211-15	—	—	—	—
C211-16	Crankshaft position sensor output – A terminal	Crankshaft position sensor	Key ON/Engine OFF	1.5 - 1.6 V
			Idle	1.5 - 1.6 V
C211-17	—	—	—	—
C211-18	Canister close valve input	Canister close valve	Key ON/Engine OFF	B+
			Idle	B+
C211-19	—	—	—	—
C211-20	—	—	—	—
C211-21	—	—	—	—
C211-22	—	—	—	—
C211-23	Engine coolant temperature output to TCM	Transmission control module	Key ON/Engine OFF	0.61 V
			Idle	0.73 V
C211-24	—	—	—	—

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**Fig. 11: ECM Pin Voltage Chart (Sportage - 1 Of 4)**  
**Courtesy of KIA MOTORS AMERICA, INC.**

TERMINAL	SIGNAL	CONNECTED TO	TEST CONDITION	VOLTAGE
C211-25	Ignition coil control	Ignition coil (cyl 1 & 4)	Key ON/Engine OFF	B+
			Idle	B+
C211-26	Battery voltage	Battery	Key ON/Engine OFF	B+
			Idle	B+
C211-27	EGI main relay control	EGI main relay	Key ON/Engine OFF	0.9 V
			Idle	0.9 V
C211-28	ECM ground	Ground	Key ON/Engine OFF	0.01 V
			Idle	0.01 V
C211-29	Idle air control valve - opening coil	Idle air control	Key ON/Engine OFF	9.85 V
			Idle	10.5 V
C211-30	Rear HO2S heater ground	Rear heated oxygen sensor	Key ON/Engine OFF	< 0.3 V
C211-31	Fuel injector control	Fuel injector #3	Key ON/Engine OFF	B+
			Idle	B+
C211-32	Fuel injector control	Fuel injector #2	Key ON/Engine OFF	B+
			Idle	B+
C211-33	—	—	—	—
C211-34	Output stage ground	Ground	Key ON/Engine OFF	0.01 V
			Idle	0.02 V
C211-35	—	—	—	—
C211-36	Purge solenoid control	Purge solenoid valve	Key ON/Engine OFF	B+
			Idle	B+
C211-37	Front HO2S heater control	Front heated oxygen sensor	Key ON/Engine OFF	0.0 V
			Idle	0.3 - 0.5 V
C211-38	Throttle position signal output	Transmission control module	Key ON/Engine OFF	10.8 V
			Idle	12 v
C211-39	Rear HO2S input	Rear heated oxygen sensor	Key ON/Engine OFF	0.45 V
			Idle	0.6 - 0.7 V
C211-41	Mass air flow sensor input	Mass air flow sensor	Idle (800 rpm)	0.9 - 1.1 V
			3300 rpm	1.8 - 2.0 V
C211-42	Vehicle speed input	Instrument cluster	Key ON/Engine OFF	5.54 V
			Idle	5.72 V
C211-43	Crankshaft position sensor input - B terminal	Crankshaft position	Key ON/Engine OFF	1.6 V
			Idle	1.6 V

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**Fig. 12: ECM Pin Voltage Chart (Sportage - 2 Of 4)**  
**Courtesy of KIA MOTORS AMERICA, INC.**

TERMINAL	SIGNAL	CONNECTED TO	TEST CONDITION	VOLTAGE
C211-44	Camshaft position sensor input	Camshaft position sensor	Key ON/Engine OFF	5.04 V
			Idle	4.1 - 4.5 V
C211-45	—	—	—	—
C211-46	—	—	—	—
C211-47	Engine RPM to TCM	TCM	Key ON/Engine OFF	0.04 V
			Idle	8 V
C211-48	A/C cut relay control	A/C cut relay	Idle / A/C OFF	B+
			A/C ON	Approx. 0 V
C211-49	—	—	—	—
C211-50	—	—	—	—
C211-51	—	—	—	—
C211-52	Ignition coil control	Ignition coil (cyl 2 & 3)	Key ON/Engine OFF	B+
			Idle	B+
C211-53	—	—	—	—
C211-54	Power	EGI main relay	Key ON/Engine OFF	B+
			Idle	B+
C211-55	Ignition ground	Ground	Key ON/Engine OFF	0.01 V
			Idle	0.01
C211-56	—	—	—	—
C211-57	—	—	—	—
C211-58	Ignition input	Ignition switch	Key ON/Engine OFF	B+
			Idle	B+
C211-59	Reference voltage	Chassis acceleration sensor, fuel tank pressure sensor, throttle position sensor	Key ON/Engine OFF	5.04 V
			Idle	5.04 V
C211-60	—	—	—	—
C211-61	MIL request	Transmission control module	Key ON/Engine OFF	12.3 V
			Idle	13.4 V
C211-62	—	—	—	—
C211-63	—	—	—	—
C211-64	A/C request input	A/C relay	Idle / A/C OFF	5 V
			A/C ON	Approx. 0 V
C211-65	A/C compressor clutch operation	A/C dual pressure switch	Idle / A/C OFF	5 V
			A/C ON	Approx. 0 V
C211-66	—	—	—	—
C211-67	—	—	—	—

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**Fig. 13: ECM Pin Voltage Chart (Sportage - 3 Of 4)**  
**Courtesy of KIA MOTORS AMERICA, INC.**

TERMINAL	SIGNAL	CONNECTED TO	TEST CONDITION	VOLTAGE
C211-68	ECT output	TCM	Key ON/Engine OFF(170°F)	0.01 V
			Idle(194°F)	13.2 V
C211-69	—	—	—	—
C211-70	Knock sensor input	Knock sensor	Key ON/Engine OFF	0.03 V
C211-71	Sensor ground	Chassis acceleration sensor, EGR differential pressure sensor, engine coolant temperature sensor, knock sensor, fuel tank pressure sensor, throttle position sensor	Key ON/Engine OFF	0.01 V
			Idle	0.01 - 0.03 V
C211-72	Ground (A/T only)	Ground	MTX	5 V
			Key ON/(ATX)	0.01 V
C211-73	Throttle position sensor input	Throttle position sensor	Key ON/Engine OFF	0.6 V
			Idle	0.6 V
C211-74	—	—	—	—
C211-76	Fuel tank pressure sensor input	Fuel tank pressure sensor	Key ON/Engine OFF	2.5 V
			Idle	2.5 V
C211-77	Intake air temperature sensor input	Intake air temperature sensor	Key ON/Engine OFF(-48°F)	5 V
			Idle(123°F)	2.2 V
C211-78	Engine coolant temperature sensor input	Engine coolant temperature sensor	Key ON/Engine OFF(-40°F)	5 V
			Idle(186°F)	1.1 V
C211-79	—	—	—	—
C211-80	Chassis acceleration sensor input	Chassis acceleration sensor	Key ON/Engine OFF	2.5 V
			Idle	2.5 V
C211-83	Diagnosis - K-Line	OBD-II data link connector	Key ON/Engine OFF	B+
			Idle/Communication between ECM to scantool	8 - 10 V
C211-84	—	—	—	—
C211-85	—	—	—	—
C211-86	Park/Neutral input (A/T only)	Transmission range switch	ATX(Except P&N Range)	B+
			MTX, ATX(P&N Range)	0.01 V
C211-87	—	—	—	—
C211-88	—	—	—	—

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**Fig. 14: ECM Pin Voltage Chart (Sportage - 4 Of 4)**  
**Courtesy of KIA MOTORS AMERICA, INC.**