

Engine Control Module (ECM)

1. Harness Connector



Connector [EGG-K]

2. Terminal Function

Connector [EGG-K]

Pin No.	Description	Connected to
1	ETC Motor (+)	ETC Module
2	ETC Motor (-)	ETC Module
3	Power Ground	Chassis Ground
4	Power Ground	Chassis Ground
5	Battery voltage supply after main relay	Main Relay
6	Battery voltage supply after main relay	Main Relay
7	Heated Oxygen Sensor (Sensor 1) Heater control output	Heated Oxygen Sensor (Sensor 1)
8	Injector (Cylinder #2) control output	Injector (Cylinder #2)
9	Injector (Cylinder #1) control output	Injector (Cylinder #1)
10	Engine RPM signal output	Trip computer
11	ISG OFF switch signal input	ISG OFF Switch [With ISG]
12	Start switch signal input	Ignition switch
13	Electric Load signal input (Defrost)	
14	A/C switch "ON" signal input	A/C Switch
15	Alternator load signal input	Alternator
16	-	
17	Camshaft Position Sensor signal input	Camshaft Position Sensor (CMPS)
18	Battery voltage supply after ignition switch	Ignition Switch
19	Sensor power (+5V)	Accelerator Position Sensor (APS) #2
20	Sensor power (+5V)	Manifold absolute pressure sensor (MAPS)
21	Sensor power (+5V)	Throttle position sensor (TPS) #1,2 [ETC module]
22	Intake Air temperature sensor (IATS) signal input	Intake Air temperature sensor (IATS)

23	Manifold absolute pressure sensor (MAPS) signal input	Manifold absolute pressure sensor (MAPS)
24	Throttle position sensor (TPS) #1 signal input	Throttle position sensor (TPS) #1,2 [ETC module]
25	A/C pressure transducer (APT) signal input	A/C pressure transducer (APT)
26	Sensor ground	Camshaft Position Sensor (CMPS)
27	Ignition coil (Cylinder #3) control output	Ignition coil (Cylinder #3)
28	Ignition coil (Cylinder #1) control output	Ignition coil (Cylinder #1)
29	Purge Control Solenoid Valve control output	Purge Control Solenoid Valve (PCSV)
30	Battery voltage supply after main relay	Main Relay
31	Cooling Fan Relay [Low] control output	Cooling Fan Relay [Low]
32	Alternator PWM control output	Alternator [With ISG]
33	Clutch switch signal input	Clutch switch
34	Brake lamp switch signal input	Brake lamp switch
35	Neutral Switch signal input	Neutral Switch [With ISG]
36	Head lamp relay (Low) control output	Head lamp relay
37	A/C pressure switch signal input	A/C pressure switch
38	Brake switch signal input	Brake switch
39	Vehicle speed signal input	ABS/ESP Control Module [With ABS/ESP]
40	Sensor ground	A/C Pressure Transducer (APT)
41	Sensor ground	Accelerator Position Sensor (APS) #1
42	Sensor power (+5V)	Crankshaft Position Sensor (CKPS) [With ISG]
		A/C Pressure Transducer (APT)
		Brake Booster Vacuum Pressure Sensor [With ISG]
43	Sensor power (+5V)	Accelerator Position Sensor (APS) #1
44	Engine coolant temperature sensor (ECTS) signal input	Engine coolant temperature sensor (ECTS)
45	-	
46	-	
47	-	
48	-	
49	Ignition Coil (Cylinder #2) control output	Ignition Coil (Cylinder #2)
50	Ignition Coil (Cylinder #4) control output	Ignition Coil (Cylinder #4)
51	Injector (Cylinder #3) control output	Injector (Cylinder #3)
52	Start Relay control output	Start Relay [With ISG]

53	Cooling Fan Relay [High] control output	Cooling Fan Relay [High]
54	Immobilizer lamp control output	Immobilizer lamp (Cluster)
55	Fuel consumption signal output	Trip computer
56	Crankshaft Position Sensor [B] signal input	Crankshaft Position Sensor (CKPS) [Without ISG]
57	CAN [High]	Other control module
58	LIN communication (K-Line)	Battery Sensor [With ISG]
59	CAN 1 [High] - Calibration	Other control module
60	-	
61	Sensor ground	Brake Booster Vacuum Pressure Sensor [With ISG]
62	Cruise ground	Cruise control switch
63	Sensor ground	Engine Coolant Temperature Sensor (ECTS)
64	-	
65	Sensor ground	Accelerator Position Sensor (APS) #2
66	Heated Oxygen Sensor (Sensor 2) signal input	Heated Oxygen Sensor (Sensor 2)
67	Accelerator Position Sensor (APS) #1 signal input	Accelerator Position Sensor (APS) #1
68	Cruise switch signal input	Cruise control switch
69	Accelerator Position Sensor (APS) #2 signal input	Accelerator Position Sensor (APS) #2
70	Sensor ground	Knock sensor (KS)
71	Heated Oxygen Sensor (Sensor 2) Heater control output	Heated Oxygen Sensor (Sensor 2)
72	-	
73	Malfunction Indicator Lamp (MIL) control output	Malfunction Indicator Lamp (Cluster)
74	Injector (Cylinder #4) control output	Injector (Cylinder #4)
75	Fuel Pump Relay control output (With Immobilizer)	Fuel Pump Relay
	A/C compressor relay control output (W/O Immobilizer)	A/C compressor relay
76	Fuel Pump Relay control output (W/O Immobilizer)	Fuel Pump Relay
	A/C compressor relay control output (With Immobilizer)	A/C compressor relay
77	Power ground	Chassis ground
78	Sensor ground	Crankshaft Position Sensor (CKPS) [With ISG]
79	CAN [Low]	Other control module

80	Immobilizer communication line	Immobilizer control module
81	CAN 1 [Low] - Calibration	Other control module
82	-	
83	Sensor ground	Manifold absolute pressure sensor (MAPS)
84	-	
85	Sensor ground	Throttle position sensor (TPS) #1,2 [ETC module]
86	Sensor ground	Heated Oxygen Sensor (Sensor 1,2)
87	Heated Oxygen Sensor (Sensor 1) signal input	Heated Oxygen Sensor (Sensor 1)
88	Throttle position sensor (TPS) #2 signal input	Throttle position sensor (TPS) #1,2 [ETC module]
89	Startar Relay Monitoring signal input [With ISG]	Startar Relay [With ISG]
	Blower Switch Max. signal input	A/C Control Module [With ISG]
90	Brake Booster Vacuum Pressure Sensor signal input	Brake Booster Vacuum Pressure Sensor [With ISG]
91	Knock sensor (KS) signal input	Knock sensor (KS)
92	CVVT Oil Control Valve control output	CVVT Oil Control Valve (OCV)
93	-	
94	Auto Stop Lamp output	ISG OFF Switch [With ISG]

3. Terminal input/output signal

Connector [EGG-K]

Pin	Description	Condition	In/Output Signal		Test result
			Type	Level	
1	ETC Motor (+)	Idle	PULSE	High :Battery voltage	13.4 V
				Low : Max . 1.0V	0 V
2	ETC Motor (-)	Idle	PULSE	High :Battery voltage	13.3 V
				Low : Max . 1.0V	0 V
3	Power Ground	Idle	DC voltage	Max. 50 mV	
4	Power Ground	Idle	DC voltage	Max. 50 mV	
5	Battery voltage supply after main relay	IG OFF	DC voltage	Max. 1.0 V	3.1 mV
		IG ON		Battery voltage	12.1 V
6	Battery voltage supply after main relay	IG OFF	DC voltage	Max. 1.0 V	3.1 mV
		IG ON		Battery voltage	12.1 V
7		Engine Run	Pulse	Hi: Battery Voltage	14.2V

	Heated Oxygen Sensor (Sensor 1) Heater control output			Lo: Max. 1.0V	220mV
8	Injector (Cylinder #2) control output	Idle	Pulse	Hi: Battery Voltage	13.6V
				Lo: Max. 1.0V	336mV
				Vpeak: Max. 80V	69.7V
9	Injector (Cylinder #1) control output	Idle	Pulse	Hi: Battery Voltage	13.6V
				Lo: Max. 1.0V	336mV
				Vpeak: Max. 80V	69.7V
10	Engine RPM signal input				
11	ISG OFF switch signal input				
12	Start switch signal input				
13	Electric Load signal input (Defrost)				
14	A/C switch "ON" signal input	A/C S/W OFF	DC	Max.0.5V	200mV
		A/C S/W ON		Battery Voltage	12.6V
15	Alternator load signal input	Idle	Pulse	Hi: Battery Voltage	13.2V
				Lo: Max. 1.5V	1.34V
16	-				
17	Camshaft Position Sensor (CMPS) signal input	Idle	Pulse	Hi: Battery Voltage	13.72V
				Lo: Max. 0.5V	200mV
18	Battery voltage supply after ignition switch	IG OFF	DC	Max. 1.0V	200mV
		IG ON		Battery Voltage	12.9V
19	Sensor power (+5V)	IG OFF	DC voltage	Max. 0.5V	5 mV
		IG ON		3.3±0.1V	3.02 V
20	Sensor power (+5V)	IG OFF	DC	Max. 0.5V	3.6mV
		IG ON		4.8 ~ 5.2V	5.02V
21	Sensor power (+5V)	IG OFF	DC voltage	Max. 0.5V	0 mV
		IG ON		5±0.1V	4.98 V
22	Intake Air temperature sensor (IATS) signal input	Idle	Analog	0V ~ 5V	2.55 V
23	Manifold absolute pressure sensor (MAPS) signal input	Idle	Analog	0.8 V ~ 1.6 V	1.37 V
24	Throttle position sensor (TPS) #1 signal input	C.T	Analog	0.3 ~ 0.9V	0.65 V
		W.O.T		1.5 ~ 3.0V	1.63 V
25	A/C pressure transducer (APT) signal input	A/C ON	Analog	Max. 4.8V	1.88V
26	Sensor ground	Idle	DC	Max. 50mV	12mV

27	Ignition coil (Cylinder #3) control output	Idle	Pulse	1st Voltage: 300 ~ 400V	372V
				ON Voltage: Max. 2.0V	1.1V
28	Ignition coil (Cylinder #1) control output	Idle	Pulse	1st Voltage: 300 ~ 400V	372V
				ON Voltage: Max. 2.0V	1.1V
29	Purge Control Solenoid Valve control output	Active	Pulse	Hi: Battery Voltage	14.2V
		Inactive		Lo: Max. 1.0V	120mV
30	Battery voltage supply after main relay	IG OFF	DC voltage	Max. 1.0 V	3.1 mV
		IG ON		Battery voltage	12.1 V
31	Cooling Fan Relay [Low] control output	Relay OFF	DC	Battery Voltage	14.12V
		Relay ON		Max. 1.0V	61.6mV
32	Alternator PWM control output				
33	Clutch switch signal input				
34	Brake lamp switch signal input	Brake ON	DC voltage	Battery voltage	
		Brake OFF		Max. 0.5 V	
35	Neutral Switch signal input				
36	Head lamp relay (Low) control output				
37	A/C pressure switch signal input	A/C S/W OFF	DC	Max.0.5V	200mV
		A/C S/W ON		Battery Voltage	12.6V
38	Brake switch signal input	PUSH	DC voltage	Max. 0.5 V	
		Normal		Battery voltage	
39	Vehicle speed signal input	Engine run	PULSE	High : Min. 4.5V	5 V
				Low : Max. 0.5V	0 V
40	Sensor ground	Idle	DC	Max. 50mV	
41	Sensor ground	Idle	DC voltage	Max. 50 mV	30 mV
42	Sensor power (+5V)				
43	Sensor power (+5V)	IG OFF	DC voltage	Max. 0.5V	5 mV
		IG ON		3.3±0.1V	3.02 V
44	Engine coolant temperature sensor (ECTS) signal input	Idle	Analog	0.5 ~ 4.5V	1.43V
45	-				
46	-				

47	-				
48	-				
49	Ignition Coil (Cylinder #2) control output	Idle	Pulse	1st Voltage: 300 ~ 400V	372V
				ON Voltage: Max. 2.0V	1.1V
50	Ignition Coil (Cylinder #4) control output	Idle	Pulse	1st Voltage: 300 ~ 400V	372V
				ON Voltage: Max. 2.0V	1.1V
51	Injector (Cylinder #3) control output	Idle	Pulse	Hi: Battery Voltage	13.6V
				Lo: Max. 1.0V	336mV
				Vpeak: Max. 80V	69.7V
52	Start Relay control output				
53	Cooling Fan Relay [High] control output				
54	Immobilizer lamp control output	lamp OFF	DC voltage	High :Battery voltage	13.2 V
		lamp ON		Low : Max . 2.0V	40 mV
55	Fuel consumption signal input				
56	Crankshaft Position Sensor [B] signal input				
57	CAN [High]	RECESSIVE	PULSE	2.0 ~ 3.0 V	2.58 V
		DOMINANT		2.75~4.5 V	3.54 V
58	LIN communication (K-Line)				
59	CAN 1 [High] - Calibration				
60	-				
61	Sensor ground				
62	Cruise ground				
63	Sensor ground	Idle	DC	Max. 50mV	16.8mV
64	-				
65	Sensor ground	Idle	DC voltage	Max. 50 mV	30 mV
66	Heated Oxygen Sensor (Sensor 2) signal input	Idle	DC voltage	Rich : 0.6 ~ 1.0 V	740 mV
				Lean : Max. 0.4 V	70m V
67	Accelerator Position Sensor (APS) #1 signal input	C.T	Analog	0.2 ~ 0.7V	0.5 V
		W.O.T		1.2 ~ 2.4V	2.1V
68	Cruise switch signal input				

69	Accelerator Position Sensor (APS) #2 signal input	C.T	Analog	0.2 ~ 0.7V	0.5 V
		W.O.T		1.2 ~ 2.4V	2.1V
70	Sensor ground	Idle	DC voltage	Max. 50 mV	8 mV
71	Heated Oxygen Sensor (Sensor 2) Heater control output	Engine run	PULSE	High :Battery voltage	14V
				Low : Max. 1.0V	0.31V
72	-				
73	Malfunction Indicator Lamp (MIL) control output	lamp OFF	DC voltage	Battery voltage	13.8 V
		lamp ON		Max. 1.0V	54 mV
74	Injector (Cylinder #4) control output	Idle	Pulse	Hi: Battery Voltage	13.6V
				Lo: Max. 1.0V	336mV
				Vpeak: Max. 80V	69.7V
75	Fuel Pump Relay control output (With Immobilizer)	relay OFF	DC voltage	Battery voltage	12.8 V
		relay ON		Max. 1.0V	40 mV
				Vpeak : Max. 70V	47.3 V
				Resistance : 680 Ω	680 Ω
	A/C compressor relay control output (W/O Imobilizer)	A/C OFF	DC voltage	Battery voltage	14.3 V
		A/C ON		Max. 1.0V	102 mV
76	Fuel Pump Relay control output (W/O Immobilizer)	relay OFF	DC voltage	Battery voltage	12.8 V
		relay ON		Max. 1.0V	40 mV
				Vpeak : Max. 70V	47.3 V
				Resistance : 680 Ω	680 Ω
	A/C compressor relay control output (With Immobilizer)	A/C OFF	DC voltage	Battery voltage	14.3 V
		A/C ON		Max. 1.0V	102 mV
77	Power ground	Idle	DC voltage	Max. 50mV	
78	Sensor ground				
79	CAN [Low]	RECESSIVE	PULSE	2.0 ~ 3.0 V	2.64 V
		DOMINANT		0.5~2.25 V	1.52 V
80	Immobilizer communication line	After IG.ON	PULSE	High : Min. 8.5V	11.8 V
		Communication		Low : Max . 3.5V	1.0 V
81	CAN 1 [Low] - Calibration				
82	-				
83	Sensor ground	Idle	DC voltage	Max. 50 mV	7 mV

84	-				
85	Sensor ground	Idle	DC voltage	Max. 50 mV	6 mV
86	Sensor ground	Idle	DC voltage	Max. 50 mV	10 mV
87	Heated Oxygen Sensor (Sensor 1) signal input	Idle	DC voltage	Rich : 0.6 ~ 1.0 V	740 mV
				Lean : Max. 0.4 V	70m V
88	Throttle position sensor (TPS) #2 signal input	C.T	Analog	4.2 ~ 5.0V	4.52 V
		W.O.T		3.3 ~ 3.8V	3.68 V
89	Startar Relay Monitoring signal input [With ISG]				
	Blower Switch Max. signal input				
90	Brake Booster Vacuum Pressure Sensor signal input				
91	Knock sensor (KS) signal input	Knocking	Irregula Frequency	0.3 ~ 0.3 V	Normal
		Normal		0 V	
92	CVVT Oil Control Valve control output	Idle	PULSE	High :Battery voltage	15.0 V
				Low : Max. 1.0V	120 mV
				Vpeak : Max. 70V	15.0 V
93	-				
94	Auto Stop Lamp output				