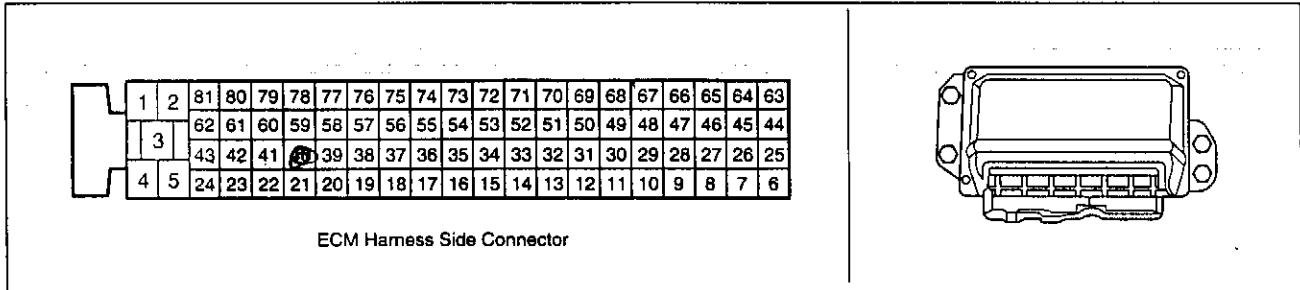


1. ECM HARNESS CONNECTOR E482A336



LGGE010A

2. ECM TERMINAL FUNCTION

Pin No.	Description	Connected to / <i>current</i>	Remark
✓ 1	Not connected		
✓ 2	Ignition coil output 2,3	Ignition Coil #2, 3	
✓ 3	Ignition shield ground	Chassis ground / <i>Grd Immobilizer</i>	
✓ 4	Not connected		
✓ 5	Ignition coil output 1,4	Ignition Coil #1, 4	
✓ 6	Injector output (cyl.2)	Injector (cyl.2)	
✓ 7	Injector output (cyl.3)	Injector (cyl.3)	
✓ 8	Engine Speed signal output	Tachometer	
✓ 9	Not connected		
✓ 10	Not connected		
✓ 11	Fuel Consumption signal output	Trip Computer / <i>Npt used</i>	
✓ 12	Battery Voltage Supply	Battery / <i>Memory</i>	
✓ 13	Ignition switch signal input	Ignition Switch / <i>Starter input</i>	
✓ 14	Main Relay control output	Main Relay	
✓ 15	Crankshaft Position Sensor input	Crankshaft Position Sensor (CKPS)	
✓ 16	Throttle Position Sensor input	Throttle Position Sensor (TPS)	
✓ 17	Sensor ground	TPS, Acceleration Sensor	Except for LEAD
✓ 18	HO2S (B1/S1) input	HO2S (B1/S1) / <i>Sensor O₂</i>	
✓ 19	Knock Sensor Input	Knock Sensor / <i>Not used</i>	
✓ 20	Knock Sensor ground	Knock Sensor / <i>Not used</i>	
✓ 21	Not connected		
✓ 22	Not connected		
✓ 23	Not connected		
✓ 24	Air Conditioner Compressor Switch (MIDDLE) input	Triple Switch / <i>ck out</i>	
✓ 25	Not connected		
✓ 26	Idle Speed Control Actuator PWM output 2 (CLOSE)	Idle Speed Control Actuator	

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Pin No.	Description	Connected to	Remark
✓ 27	Injector output (cyl.1)	Injector (cyl.1)	
✓ 28	HO2S Heater (B1/S2)	HO2S (B1/S2) / Heater O2	E-OBD only
✓ 29	Idle Speed Control Actuator PWM output 1 (OPEN)	Idle Speed Control Actuator (ISCA)	
✓ 30	Not connected		
✓ 31	Malfunction Indicating Lamp (MIL) output	Malfunction Indicating Lamp (MIL)	
✓ 32	Sensor supply (+5V)	TPS, Acceleration Sensor	
✓ 33	Sensor supply (+5V)	MAPS, IATS	
✓ 34	Not connected		
✓ 35	Sensor ground	HO2S (Sensor 2), ECTS / ECT & O2	
✓ 36	Sensor ground	HO2S (Sensor 1), MAPS, IATS	
✓ 37	Manifold Absolute Pressure Sensor signal input	Manifold Absolute Pressure Sensor (MAPS)	
✓ 38	Not connected		
✓ 39	Engine Coolant Temperature Sensor input	Engine Coolant Temperature Sensor (ECTS)	
✓ 40	Not connected		
✓ 41	Not connected		
✓ 42	Intake Air Temperature Sensor input	Intake Air Temperature Sensor (IATS)	
✓ 43	Electrical Load 3 (Head Lamp)	old Not shown	Active : Low
✓ 44	Battery Voltage Supply after Main Relay	Main Relay / relay input	
✓ 45	Battery Voltage Supply after Main Relay	Main Relay / relay input	
✓ 46	Purge Control Solenoid Valve (PCSV) PWM output	Purge Control Solenoid Valve (PCSV)	
✓ 47	Injector output (cyl.4)	Injector (cyl.4)	
✓ 48	HO2S Heater (B1/S1)	HO2S (B1/S1)	Except for LEAD
✓ 49	Immobilizer Lamp output	Immobilizer Lamp	With Immobilizer
✓ 50	Cooling Fan Relay - High control output	Cooling Fan Relay / Not used	
✓ 51	Ground of electronic	Chassis ground / Grd sensor	
✓ 52	Immobilizer Data Line	Immobilizer	With Immobilizer
✓ 53	Ground of electronic	Chassis ground / Grd sensor	
✓ 54	Not connected		
✓ 55	HO2S (B1/S2) input	HO2S (B1/S2) / O2	E-OBD only
✓ 56	Not connected		
✓ 57	Air Conditioner Compressor Switch (LOW/HIGH) input	Triple Switch / A/C pressure SW input	
✓ 58	Not connected		
✓ 59	Vehicle Speed Sensor input	Vehicle Speed Sensor	

Pin No.	Description	Connected to	Remark
✓ 60	Acceleraton sensor input	Acceleration Sensor	E-OBD only
✓ 61	Immobilizer ground	Immobilizer / Grd	With Immobilizer
✓ 62	CAN - HIGH	TCM / not used	AT Only
✓ 63	Battery Voltage Supply after Main Relay	Main Relay / ENGINE Relay input	
✓ 64	Not connected		
✓ 65	Not connected		
✓ 66	Not connected		
✓ 67	Not connected		
✓ 68	Cooling Fan Relay - Low control output	Cooling Fan Relay / Road relay coil	
✓ 69	Air Conditioner Compressor Relay control output	Air Conditioner Compressor Relay / A/C Relay	
✓ 70	Electric Fuel Pump Relay control output	Electric Fuel Pump Relay / Fuel pump	
✓ 71	Diagnostic Data Line (k-Line)	Data Link Connector (DLC)	
✓ 72	Not connected		
✓ 73	Not connected		
✓ 74	Not connected		
✓ 75	Air Conditioner Pressure switch input	Triple Switch / A/C sw input	
✓ 76	Electrical Load 1 (Defroster)	+ Positive / Multi Function	Active : High
✓ 77	Electrical Load 2 (Power Steering Pump)	- Power str	Active : Low
✓ 78	MT/AT Encoding line	MT: Open, AT: Ground / Grd & Term	
✓ 79	Camshaft Position Sensor input	Camshaft Position Sensor (CMPS) / Cam sig	
✓ 80	Power stage ground	Chassis ground	
✓ 81	CAN - LOW	TCM	AT Only

3. ECM TERMINAL INPUT/OUTPUT SIGNAL

WIRE COLOR	Pin No.	Description	Vehicle State	Input/Output Value		Test Result	Remark
				Type	Level		
N/A	1	Not connected					
GREEN BLACK	2	Ignition coil output 2,3	Idle	Pulse	1st voltage: 300~400V	370.69 V	
					ON: Max. 2V	1.82 V	
	3	Ignition shield ground	Idle	DC	Max. 50 mV	0.133 mV	
N/A	4	Not connected					
WHITE	5	Ignition coil output 1,4	Idle	Pulse	1st voltage: 300~400V	382.55 V	
					ON: Max. 2V	1.24 V	
BLUE	6	Injector output (cyl.2)	Idle	Pulse	High: Vbatt	13.57 V	
					Low: Max. 2V	0.41 V	
PINK	7	Injector output (cyl.3)	Idle	Pulse	High: Vbatt	13.81 V	
					Low: Max. 2V	0.37 V	
YELLOW BLACK	8	Engine Speed signal output	Idle	Pulse	High: Vbatt	13.9 V	Idle: 20 ~ 26 Hz
					Low: Max. 0.5 V	0.037 V	
N/A	9	Not connected					
N/A	10	Not connected					
N/A	11	Fuel Consumption signal output	Idle	Pulse	High: Vbatt or Vcc	4.23 V	
					Low: Max. 0.5V	1.0 mV	
BROWN	12	Battery Voltage Supply	Always	Current	Max. 1.0 mA	0.40 mA	
				DC	Vbatt	13.65 V	
WHITE	13	Ignition switch signal input	IG OFF	DC	Max. 0.5 V	0.01 V	
			IG ON		Vbatt	12.85 V	
ORANGE	14	Main Relay control output	Relay ON	DC	Max. 1.0 V	0.03 V	
			Relay OFF		Vbatt	12.5 V	
GREEN	15	Crankshaft Position Sensor input	Idle	Pulse	High: Vcc or Vbatt	8.91 V	
					Low: Max. 0.5V	0.13 V	
WHITE BLACK	16	Throttle Position Sensor input	C.T	Analog	0.3 ~ 0.9 V	0.502 V	
			W.O.T		4.0 ~ 4.8 V	4.604 V	
	17	Sensor ground	Idle	DC	Max. 50 mV	1.045 mV	
T. GREEN	18	HO2S (B1/S1) input	1500 rpm	Analog	RICH : 0.6 ~ 1.0V	0.703 V	
					LEAN : 0 ~ 0.4V	0.111 V	
BROWN	19	Knock Sensor Input	Knocking	Fre- quency			
			Normal				
WHITE	20	Knock Sensor ground	Idle	DC	Max. 50 mV	1.57 mV	
N/A	21	Not connected					

WIRE COLOR	Pin No.	Description	Vehicle State	Input/Output Value		Test Result	Remark
				Type	Level		
N/A	22	Not connected					
N/A	23	Not connected					
BROWN / BLK	24	Air Conditioner Compressor Switch (MIDDLE) input	MID OFF	DC	Max. 0.5 V	0.01 V	
			MID ON		Vbatt	12.29 V	
N/A	25	Not connected					
PINK / BLK	26	Idle Speed Control Actuator PWM output 2 (CLOSE)	Idle	Pulse	High: Vbatt	14.97 V	100 Hz
						Low: Max. 1.0 V	
BLK / ORANGE	27	Injector output (cyl.1)	Idle	Pulse	High: Vbatt	13.49 V	
						Low: Max. 1.0 V	
BLUE	28	HO2S Heater (B1/S2)	Engine run	Pulse	High: Vbatt	14.02 V	
						Low: Max. 1.0 V	
WHITE	29	Idle Speed Control Actuator PWM output 1 (OPEN)	Idle	Pulse	High: Vbatt	14.82 V	100 Hz
						Low: Max. 1.0 V	
N/A	30	Not connected					
BROWN / ORANGE	31	Malfunction Indicating Lamp (MIL) output	MIL OFF	DC	Vbatt	13.12 V	
			MIL ON		Max. 1.0V	0.93 V	
BLUE / ORANGE	32	Sensor supply (+5V)	IG OFF	DC	Max. 0.5 V	0.06 V	
			IG ON		4.9 ~ 5.1V	4.97 V	
ORANGE / BLK	33	Sensor supply (+5V)	IG OFF	DC	Max. 0.5 V	0.063 V	
			IG ON		4.9 ~ 5.1V	4.943 V	
N/A	34	Not connected					
PINK / BLK	35	Sensor ground	Idle	DC	Max. 50 mV	1.84 mV	
BLK / WHT	36	Sensor ground	Idle	DC	Max. 50 mV	2.06 mV	
BLUE / BLK	37	Manifold Absolute Pressure Sensor signal input	IG ON	Analog	3.9 ~ 4.1 V	4.012 V	
			Idle		0.8 ~ 1.6 V	1.253 V	
N/A	38	Not connected					
RED	39	Engine Coolant Temperature Sensor input	Idle	Analog	0.5 ~ 4.5 V	0.988 V	89.3 °C
N/A	40	Not connected					
N/A	41	Not connected					
BROWN / BLK	42	Intake Air Temperature Sensor input	Idle	Analog	0 ~ 5 V	1.68 V	67.5 °C
GREEN	43	Electrical Load 3 (Head Lamp)	Idle	DC	Vbatt		
					Max. 0.5 V		
GREEN	44	Battery Voltage Supply after Main Relay	IG OFF	DC	Max. 0.5 V	0.09 V	
			IG ON		Vbatt	12.85 V	
GREEN	45	Battery Voltage Supply after Main Relay	IG OFF	DC	Max. 0.5 V	0.061 V	
			IG ON		Vbatt	12.90 V	

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WIRE COLOR	Pin No.	Description	Vehicle State	Input/Output Value		Test Result	Remark
				Type	Level		
YELLOW	46	Purge Control Solenoid Valve (PCSV) PWM output	Inactive	Pulse	High: Vbatt	13.49 V	
			Active		Low: Max. 1.0 V	0.33 V	
YELLOW BLK	47	Injector output (cyl.4)	Idle	Pulse	High: Vbatt	13.93 V	
					Low: Max. 1.0 V	0.65 V	
BLUE orange	48	HO2S Heater (B1/S1)	Engine run	Pulse	High: Vbatt	14.04 V	
					Low: Max. 0.5 V	0 V	
N/A	49	Immobilizer Lamp output	LAMP OFF	DC	Vbatt		
			LAMP ON		Max. 1.0V		
GREEN orange	50	Cooling Fan Relay - High control output	Relay OFF	DC	Vbatt	14.3 V	
			Relay ON		Max. 1.0V	0 V	
BLACK	51	Ground of electronic	Idle	DC	Max. 50 mV	0.041 mV	
N/A	52	Immobilizer Data Line	During communication after IG ON	Pulse	High: Min 8.5 V		
					Low: Max. 3.5 V		
BLACK	53	Ground of electronic	Idle	DC	Max. 50 mV	0.86 mV	
N/A	54	Not connected					
GREEN orange	55	HO2S (B1/S2) input	Engine run	Analog	RICH : 0.6 ~ 1.0V	0.87 V	
					LEAN : 0 ~ 0.4V	0.1 V	
N/A	56	Not connected					
YELLOW	57	Air Conditioner Compressor Switch (LOW/HIGH) input	A/CON OFF	DC	Max. 0.5 V	0.225 V	
			A/CON ON		Vbatt	13.9 V	
N/A	58	Not connected					
BLUE FD	59	Vehicle Speed Sensor input	Vehicle Run	Pulse	High: Min. 5.0 V	10.63 V	
					Low: Max. 1.0 V	0 V	
N/A	60	Acceleraton sensor input	Idle	Analog	2.4 ~ 2.6 V		
N/A	61	Immobilizer ground	Idle	DC	Max. 50 mV		
GREEN	62	CAN - HIGH	Recessive	Pulse	2.7 ~ 3.0 V	2.47 V	
			Dominant		2.75 ~ 4.5 V	3.59 V	
GREEN	63	Battery Voltage Supply after Main Relay	IG OFF	DC	Max. 0.5 V	0.095 V	
			IG ON		Vbatt	12.73 V	
N/A	64	Not connected					
N/A	65	Not connected					
N/A	66	Not connected					
N/A	67	Not connected					

WIRE COLOR	Pin No.	Description	Vehicle State	Input/Output Value		Test Result	Remark
				Type	Level		
KEY	68	Cooling Fan Relay - Low control output	Relay OFF	DC	Vbatt	14.21 V	
			Relay ON		Max. 1.0V	0.012 V	
WHITE BLK	69	Air Conditioner Compressor Relay control output	A/CON OFF	DC	Vbatt	14.15 V	
			A/CON ON		Max. 1.0V	0.022 V	
RED BLK	70	Electric Fuel Pump Relay control output	Relay OFF	DC	Vbatt	13.032 V	
			Relay ON		Max. 1.0V	0 V	
GREEN BLK	71	Diagnostic Data Line (k-Line)	During communication	Pulse	[Transmitting] Hi:Min. Vbatt *80% Lo:Max. Vbatt*20%	High: 11.27 V Low: 0.074 V	
					[Receiving] Hi:Min. Vbatt*70% Lo:Max. Vbatt*30%		
N/A	72	Not connected					
N/A	73	Not connected					
N/A	74	Not connected					
YELLOW BLK	75	Air Conditioner Pressure switch input	A/CON S/W OFF	DC	Max. 1.0 V	0 V	
			A/CON S/W ON		Vbatt	14.22 V	
BLUE BLK	76	Electrical Load 1 (Defroster)	Idle	DC	Vbatt	14.01 V	
					Max. 0.5 V	0 V	
RED	77	Electrical Load 2 (Power Steering Pump)	IG ON	DC	Min. 4 V	12.02 V	
					Max. 0.5 V	-0.347 V	
BLACK	78	MT/AT Encoding line	IG ON	DC	A/T : Max. 0.5 V	1.5 mV	
					M/T : Min. 4 V		
G. GREEN BLK	79	Camshaft Position Sensor input	Idle	Pulse	High: Vcc or Vbatt	12.91 V	
					Low: Max. 0.5V	0.078 V	
RANGE	81	CAN - LOW	Recessive	Pulse	2.0 ~ 3.0 V	2.58 V	
			Dominant		0.5 ~ 2.25 V	1.45 V	