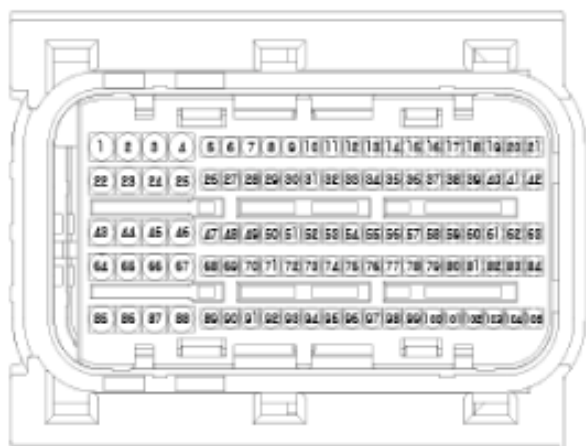
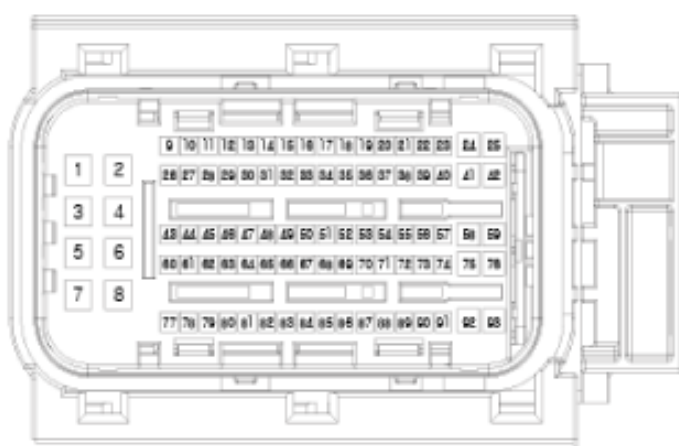


ECM Terminal And Input/Output signal



Connector [A]



Connector [B]

ECM Terminal Function

Connector [A]

Pin No	Description
1	Fuel Pressure Control Valve (FPCV) [High] control
2	Integrated Thermal Mangement Module (ITM) Motor (+)
3	Integrated Thermal Mangement Module (ITM) Motor (-)
4	-
5	Engine Coolant Temperature Sensor (ECTS) #1 (Ground)
6	-
7	Engine Coolant Temperature Sensor (ECTS) #2 (Ground)
8	-
9	Rail Pressure Sensor (RPS) (Ground)
10	-
11	Manifold Absolute Pressure Sensor (MAPS) (Ground)
12	Electric WGT Control Actuator (EWGA) (Ground)
13	-
14	Oil Pressure & Temperature Sensors (OPTS) (Ground)
15	-
16	-
17	A/C Pressure Transducer (APT) (Ground)
18	Sensor Power (+5V) (Camshaft Position Sensor (CMPS) [Bank 1 / Intake, Exhaust])

19	Sensor Power (+5V) (MAPS, CKPS)
20	Sensor Power (+5V) (OPS, ETC, RPS)
21	Sensor Ground (Throttle Position Sensor (TPS))
22	-
23	-
24	Sensor Shield (Knock Sensor (KS))
25	-
26	Ignition Coil (Cylinder #3) Control
27	-
28	-
29	-
30	-
31	-
32	-
33	-
34	-
35	Integrated Thermal Management Module (ITM) Motor (Ground)
36	-
37	Camshaft Position Sensor (CMPS) [Bank 1 / Intake] Signal
38	-
39	Electric WGT Control Actuator (EWGA) Signal
40	Sensor Power (+5V) (EWGA)
41	Sensor Power (+5V) (APS #1)
42	Sensor Power (+5V) (APT)
43	Injector (Cylinder #3) [+] Control
44	Injector (Cylinder #2) [+] Control
45	-
46	-
47	CCP-CAN (High)
48	Ignition Coil (Cylinder #1) Control
49	-
50	-
51	-
52	-
53	-

54	-
55	-
56	-
57	-
58	-
59	-
60	Camshaft Position Sensor (CMPS) [Bank 1 / Exhaust] (Ground)
61	-
62	-
63	Engine RPM Output
64	Injector (Cylinder #1) [+] Control
65	Injector (Cylinder #4) [+] Control
66	Injector (Cylinder #3) [-] Control
67	Injector (Cylinder #4) [-] Control
68	Ignition Coil (Cylinder #2) Control
69	CCP-CAN (Low)
70	Camshaft Position Sensor (CMPS) [Bank 1 / Exhaust] Signal
71	Crankshaft Position Sensor (CKPS) (Ground)
72	Ignition Lock Switch Control
73	Oil Pressure Sensor (OPS) Signal
74	Intake Air Temperature Sensor (IATS) Signal
75	Engine Coolant Temperature Sensor (ECTS) #1 Signal
76	Engine Coolant Temperature Sensor (ECTS) #2 Signal
77	-
78	-
79	Throttle Position Sensor (TPS) 2 Signal
80	Rail Pressure Sensor (RPS) Signal
81	-
82	Integrated Thermal Management Module (ITM) Motor Signal
83	-
84	A/C Pressure Transducer (APT) Signal
85	-
86	Injector (Cylinder #2) [-] Control
87	Injector (Cylinder #1) [-] Control
88	Fuel Pressure Control Valve (FPCV) [Low] control

89	-
90	Ignition Coil (Cylinder #4) Control
91	Crankshaft Position Sensor (CKPS) Signal
92	Integrated Body Control Unit (IBU) External Wake-Up Signal
93	Heated Oxygen Sensor (HO2S) [Bank 1 / Sensor 2] (Ground)
94	-
95	Heated Oxygen Sensor (HO2S) [Bank 1 / Sensor 1] Signal
96	-
97	Oil Temperature Sensor (OTS) Signal
98	Throttle Position Sensor (TPS) 1 Signal
99	-
100	-
101	Manifold Absolute Pressure Sensor (MAPS) Signal
102	Camshaft Position Sensor (CMPS) [Bank 1 / Intake] (Ground)
103	-
104	Knock Sensor (KS) Signal
105	Knock Sensor (KS) (Ground)

Connector [B]

Pin No	Description
1	Chassis Ground
2	Chassis Ground
3	Battery power (B+) (Battery)
4	Chassis Ground
5	Battery power (B+) (Main Relay)
6	Battery power (B+) (Main Relay)
7	-
8	-
9	Sensor Power (+5V) (ITM Motor)
10	Sensor Power (+5V) (APS #2)
11	Boost Pressure Sensor (BPS) Signal Input
12	Accelerator Position Sensor (APS #2) (Ground)
13	Accelerator Position Sensor (APS #1) (Ground)
14	-
15	-

16	Boost Pressure Sensor (BPS) (Ground)
17	Fuel Level Sender (FLS) Signal
18	Accelerator Position Sensor (APS #2) Signal
19	-
20	-
21	-
22	Rail Pressure Sensor (RPS) Control
23	Cooling Fan Relay [PMW] Control
24	EWGA DC Motor Control (+)
25	EWGA DC Motor Control (-)
26	Ignition Switch Signal Input
27	Sensor Power (+5V) (BPS)
28	-
29	-
30	Brake [Test] Switch Signal Input
31	Brake [Light] Switch Signal Input
32	Accelerator Position Sensor (APS #1) Signal
33	-
34	-
35	Engine Start Switch Signal Input
36	-
37	Fuel Pump Relay Control [Without Smart Key] Control
38	-
39	-
40	Variable Oil Pump Valve Control
41	ETC Motor [+] Control
42	ETC Motor [-] Control
43	-
44	-
45	P-CAN (Low)
46	-
47	-
48	Clutch Switch Control
49	Wiper Switch Input
50	-

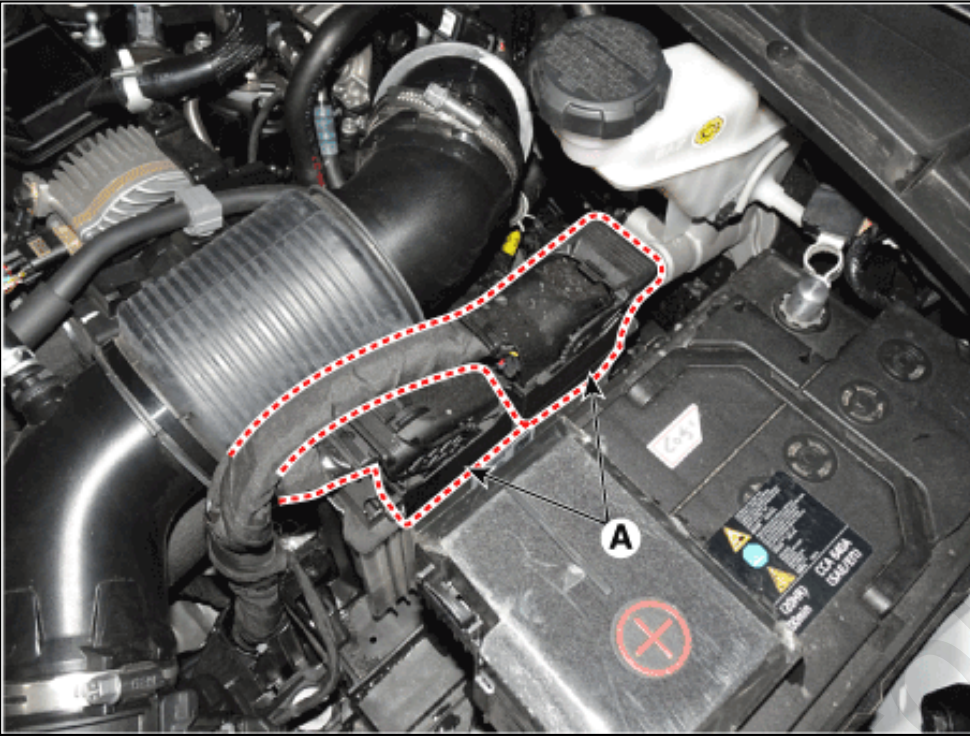
51	Start Relay (Low) Control
52	-
53	-
54	Electric load Signal Input [Defrost]
55	-
56	-
57	-
58	-
59	-
60	Battery power (B+) (Battery)
61	LIN Communication Signal Input
62	P-CAN (High)
63	-
64	Heated Oxygen Sensor (HO2S) [Bank 1 / Sensor 1] VS-/IP- (Virtual Ground)
65	Heated Oxygen Sensor (HO2S) [Bank 1 / Sensor 1] Rc/Rp (Pumping Cell Current)
66	Heated Oxygen Sensor (HO2S) [Bank 1 / Sensor 1] Rc (Adjust Resistance)
67	Heated Oxygen Sensor (HO2S) [Bank 1 / Sensor 1] VS+ (NERNST Cell Current)
68	-
69	-
70	-
71	Start Relay (High) Control
72	-
73	-
74	Engine Control Relay Control
75	Heated Oxygen Sensor (HO2S) [Bank 1 / Sensor 1] Heater Control
76	Heated Oxygen Sensor (HO2S) [Bank 1 / Sensor 2] Heater Control
77	Vehicle Speed Input (IBU, VDC Moduel)
78	CCP-CAN (High)
79	CCP-CAN (Low)
80	-
81	-
82	-
83	Purge Control Solenoid Valve (PCSV) Control
84	Fuel Pump Relay Control [With Smart Key] Control
85	-

86	-
87	Integrated Body Control Unit (IBU) (IMMO, Data Line)
88	-
89	-
90	-
91	-
92	Variable Force Solenoid (VFS) [Bank 1 / Intake] Control
93	Variable Force Solenoid (VFS) [Bank 1 / Exhaust] Control

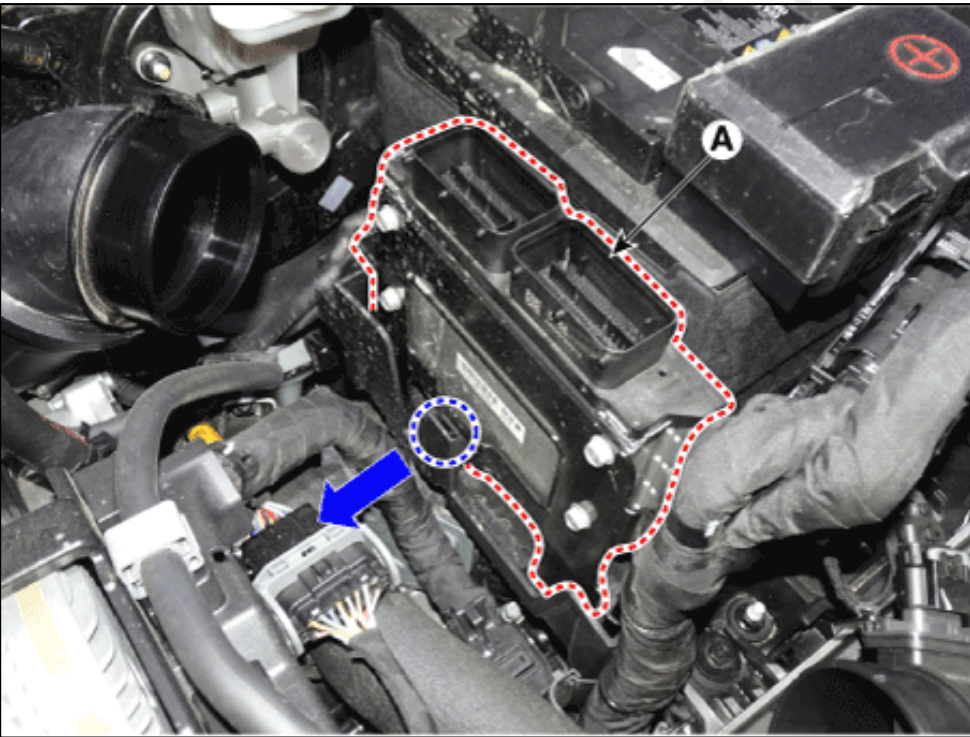
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Removal

1. Turn ignition switch OFF and disconnect the battery negative (-) terminal.
2. Disconnect the ECM Connector (A).



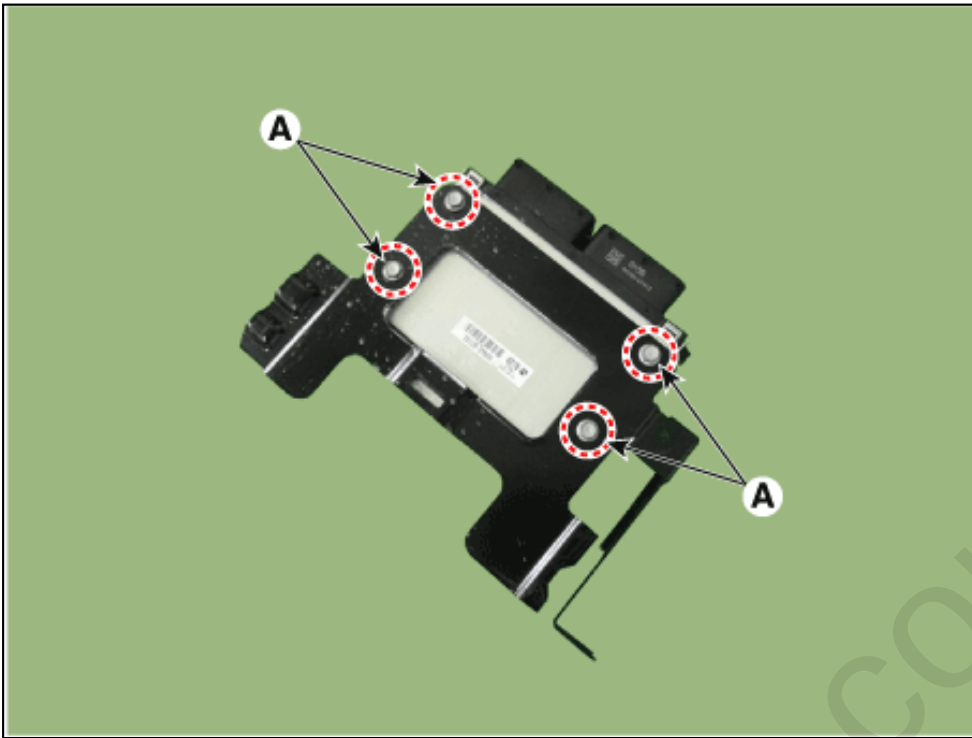
3. Remove the air cleaner assembly.
(Refer to Engine Mechanical - "Air Cleaner")
4. Remove the ECM (A) after releasing the fixing hooks.



5. Remove the ECM (B) after loosening the mounting bolts (A).

Tightening Torque :

9.8 - 11.8 N.m (1.0 - 1.2 kgf.m, 7.2 - 8.7 lb-ft)

**Installation**

1. Install in the reverse order of removal.

Inspection

1. TEST ECM GROUND CIRCUIT : Measure resistance between ECM and chassis ground using the backside of ECM harness connector as ECM side check point. If the problem is found, repair it.

Specification : Below 1Ω

2. TEST ECM CONNECTOR : Disconnect the ECM connector and visually check the ground terminals on ECM side and harness side for bent pins or poor contact pressure. If the problem is found, repair it.
3. If problem is not found in Step 1 and 2, the ECM could be faulty. If so, make sure there were no DTC's before swapping the ECM with a new one, and then check the vehicle again. If DTC's were found, examine this first before swapping ECM.
4. RE-TEST THE ORIGINAL ECM : Install the original ECM (may be broken) into a known-good vehicle and check the vehicle. If the problem occurs again, replace the original ECM with a new one. If problem does not occur, this is intermittent problem.
(Refer to "Intermittent Problem Inspection Procedure" in Basic Inspection Procedure)

Adjustment

ECM neutralization procedure (With immobilizer)



- When replacing the ECM, the vehicle equipped with the immobilizer must be performed procedure as below.

[In the case of installing used ECM]

- 1)Perform "ECM Neutral mode" procedure with diagnostic tool.
(Refer to Body Electrical System - "Immobilizer System")
- 2)After finishing "ECM Neutral mode", perform "Keyteaching" procedure with diagnostic tool.
(Refer to Body Electrical System - "Immobilizer System")

[In the case of installing new ECM]

- Perform "Key teaching" procedure with diagnostic tool.
(Refer to Body Electrical System - "Immobilizer System")

ECM Neutralization procedure (With smart key)



- When replacing the ECM, the vehicle equipped with the smart key system (Button start) must be performed procedure as below.

[In the case of installing used ECM]

- 1)Perform "ECM Neutral mode" procedure with diagnostic tool.
(Refer to Body Electrical System - "Smart Key Diagnostic")
- 2)After finishing "ECM Neutral mode", insert the key (or press the start button) and turn it to the IGN ON and OFF position. Then the ECM learns the smart key information automatically.

[In the case of installing new ECM]

- Insert the key (or press the start button) and turn it to the IGN ON and OFF position. Then the ECM learns the smart key information automatically.

ETC Module Learning Process

After replacing or re-installing the ECM, if you do not perform the ETC module learning procedure, the ETC module learning procedure must be performed since shift shock or failure code may be displayed.

(Refer to Engine Control System - "ETC System")

VIN Programming Procedure

VIN (Vehicle Identification Number) is a number that has the vehicle's information (Maker, Vehicle Type, Vehicle Line/Series, Body Type, Engine Type, Transmission Type, Model Year, Plant Location and so forth. For more information, please refer to the group "GI" in this SERVICE MANUAL). When replacing an ECM, the VIN must be programmed in the ECM. If there is no VIN in ECM memory, the fault code (DTC P0630) is set.



- The programmed VIN cannot be changed. When writing the VIN, confirm the VIN carefully.

1. Turn the ignition switch OFF.
2. Connect the diagnostic tool to Data Link Connector (DLC).
3. Turn the ignition switch ON.
4. Select "Vehicle, Model Year, Engine, System".
5. Select "Vehicle S/W Management".

6. Select "Write VIN".



S/W Management

■ Write VIN

• [Write VIN]

This function is used to write the VIN into the ECM's memory.

A new ECM requires that this function be performed following installation. Failure to perform this function will result in MIL illumination with DTC P0630. After confirming the written VIN, ECU will erase the fault code and MIL.

Press **[OK]** button, if you are ready.

OK

Cancel