SQRD4G15B IGNITION SYSTEM

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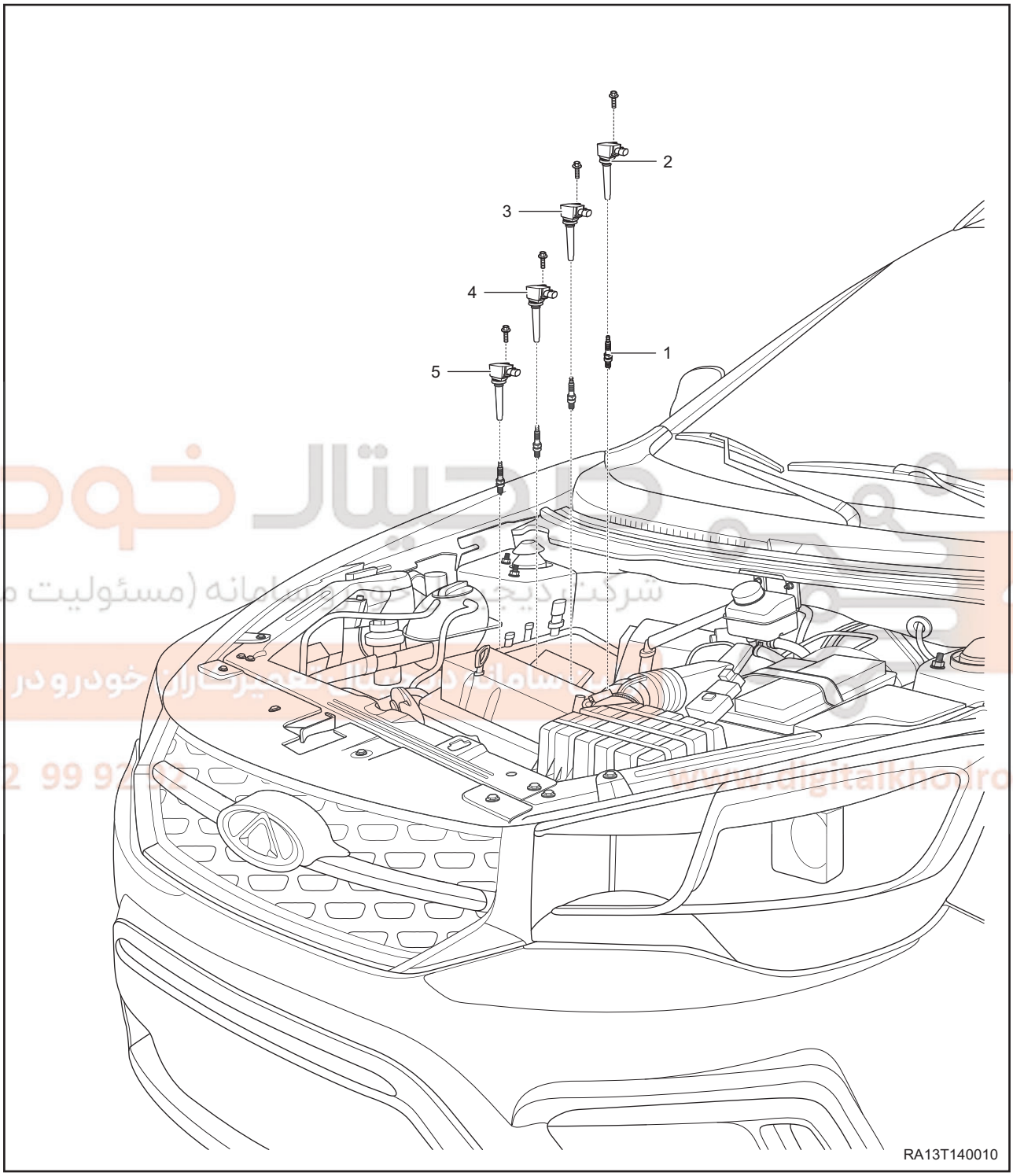
GENERAL INFORMATION

Description



1 - Spark Plug	2 - Cylinder 4 Ignition Coil Assembly
3 - Cylinder 3 Ignition Coil Assembly	4 - Cylinder 2 Ignition Coil Assembly
5 - Cylinder 1 Ignition Coil Assembly	

Operation

Ignition system mainly consists of sensors, Engine Control Module (ECM), ignition coils, spark plugs, etc. Ignition advance angle is controlled by Engine Control Module (ECM) directly.

As an integrated module, the ignition coil cannot be disassembled. SQRD4G15B ignition system is an independent one, and the secondary high-voltage terminals of each ignition coil are connected to spark plugs in each engine cylinder respectively via high-voltage posts. Primary low-voltage terminal of ignition coil connects to Engine Control Module (ECM) via wire harness.

Engine Control Module (ECM) uses phase sensor input to decide the Top Dead Center (TDC) position of cylinder 1 piston, and uses the speed sensor to decide which ignition coil is to be energized.

Specifications

Torque Specifications

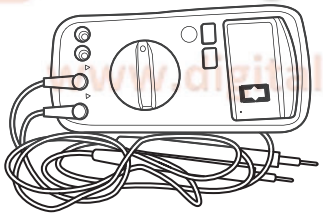
Description	Torque (N·m)
Spark Plug	20 ± 3
Ignition Coil Fixing Bolt	8 ± 2

Spark Plug Specifications

Engine Type	SQRD4G15B
Spark Plug Type	K7RT1
Spark Plug Gap (mm)	0.8 - 0.9

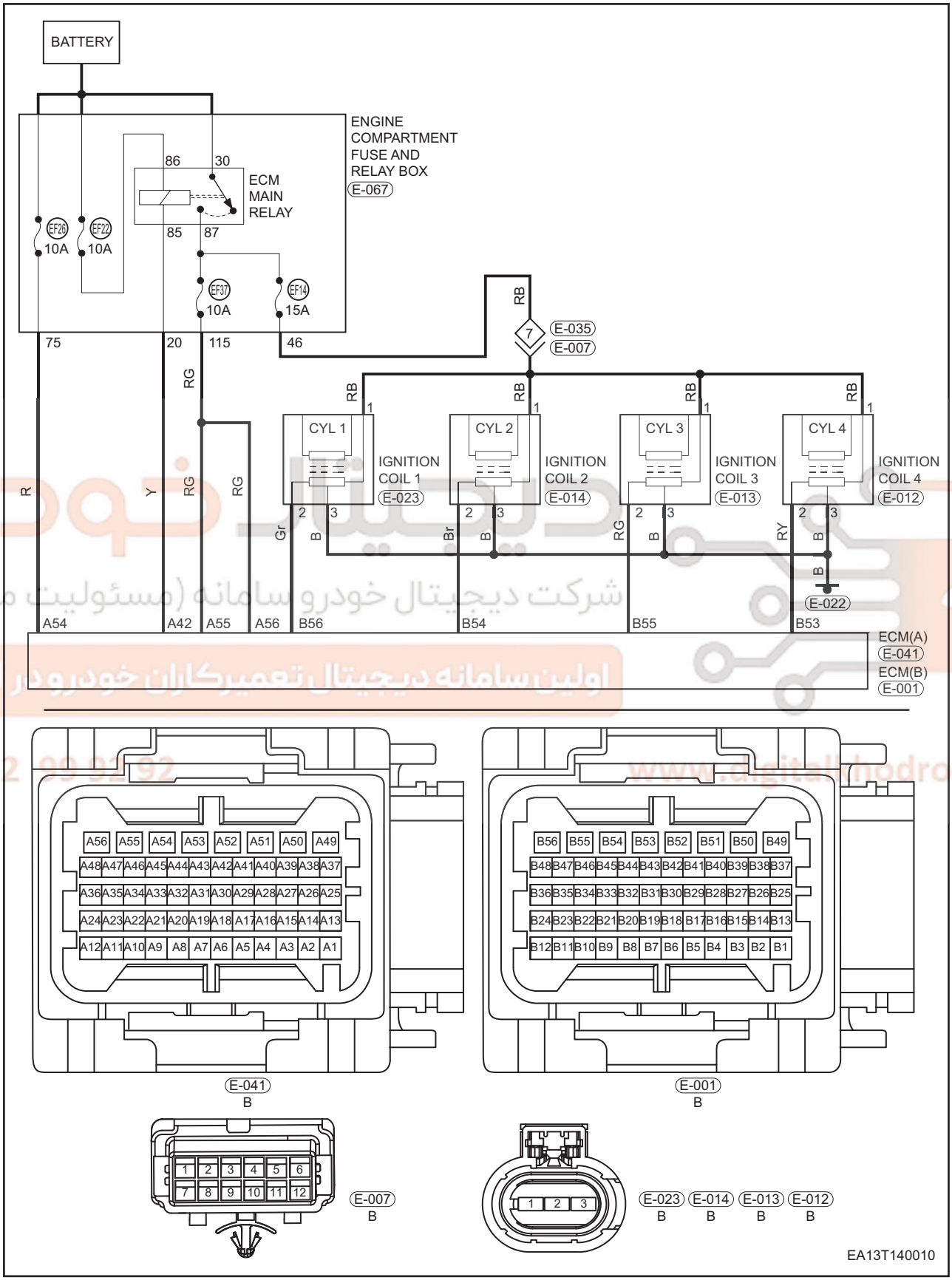
Tool

General Tool

Digital Multimeter	 RCH0000002

Circuit Diagram

Ignition System



DIAGNOSIS & TESTING

Problem Symptoms Table

HINT:
Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair or adjust faulty components, or replace as necessary.

Symptom	Suspected Area	See page
Stall	Ignition coil	14-8
	Camshaft position sensor	06-237
	Spark plug	14-10
	VVT Control Valve	06-233
	Wire harness	-
	ECM	06-245
Knock	Ignition coil	14-8
	Knock sensor	06-235
	ECM	06-245
Difficult to start	Battery	16-7
	Ignition coil	14-8
	Spark plug	14-10
	Engine speed sensor	06-238
Engine hesitation, power drop, unstable performance	Ignition coil	14-8
	Engine speed sensor	06-238
	VVT Control Valve	06-233
	Canister Solenoid Valve	06-244
	Spark plug	14-10
	Camshaft position sensor	06-237
	ECM	06-245
Rough, unstable idling or stall	Ignition coil	14-8
	Camshaft position sensor	06-237
	Spark plug	14-10
	ECM	06-245

Service Precautions

Visual inspection can reduce unnecessary test and diagnostic time, so pay attention to following inspection items:

1. Check lines and hoses for obvious looseness, and if they are disconnected or routed improperly.
2. Make sure that battery connections are clean and fixed firmly.
3. Check if alternator wire and belt are installed correctly and securely.
4. Confirm that ignition coils and high-voltage cables are installed securely.
5. Check if engine wire harness connectors are inserted fully.
6. Check if all electrical connectors are installed correctly and securely.
7. Check the following electrical connections:
   a. Engine speed sensor;
   b. Oxygen sensor;
   c. Intake pressure/temperature sensor;
   d. Oil pressure switch;
   e. Ignition coil;
   f. Canister solenoid valve;
   g. Camshaft position sensor;
   h. Electronic throttle;
   i. VVT control valve;
   j. Fuel injector.
8. Check routing of all vacuum hoses.
9. Confirm that following vacuum hoses are connected securely without any leakage:
   a. Canister solenoid valve;
   b. Charcoal canister;
   c. PCV valve;
   d. Brake booster.
10. Check fuel pump hose and wire connections to make sure that they are connected securely.

ON-VEHICLE SERVICE

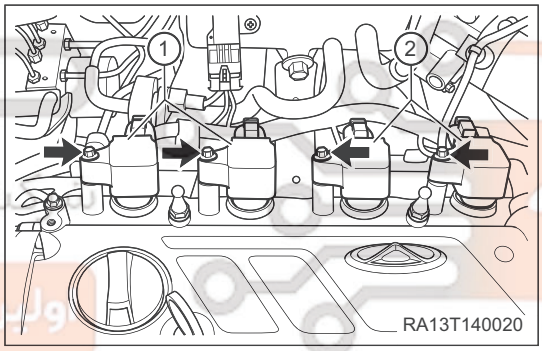
Ignition Coil and High-voltage Cable

Removal

CAUTION

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.
- It is prohibited to use high-voltage cable to perform ignition spark test during repair; otherwise it may damage electronic controllers.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Remove the ignition coil.
   a. Disconnect ignition coil connectors (1) and (2).
   b. Remove 4 fixing bolts (arrow) from ignition coil.
      (Tightening torque: 8 ~ 11 N·m)



   c. Remove the ignition coil.

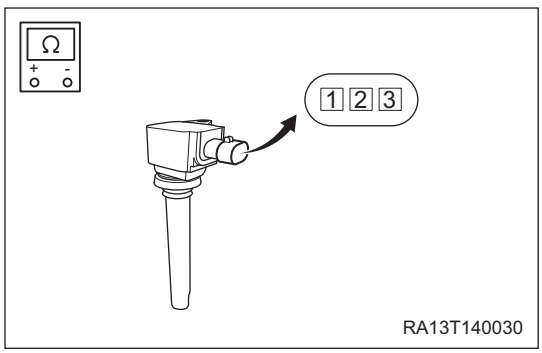
CAUTION

- Be careful not to damage ignition coils when pulling them upward.

Inspection

1. Inspect resistance of ignition coil primary winding.
   Turn digital multimeter to ohm band, and check resistance between terminal 2 and terminal 3.
   If result is not as specified, replace ignition coil.

Multimeter Connection	Condition	Specification (W)
Terminal 2 - Terminal 3	Normal temperature	0.6 - 0.9



Installation

Installation is in the reverse order of removal.

CAUTION

- Make sure that the connection between ignition coil high-voltage output terminal and spark plug is reliable, or it may cause high-voltage leakage, resulting in poor ignition.

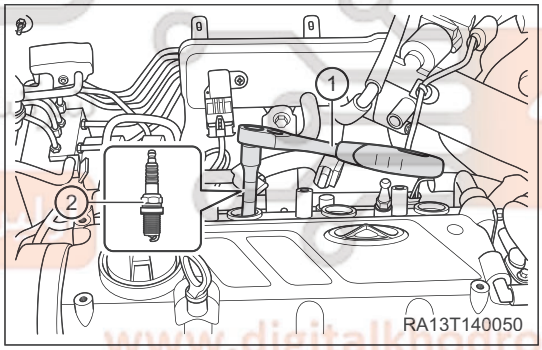
Spark Plug

Removal

CAUTION

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.
- It is prohibited to use high-voltage cable to perform ignition spark test during repair; otherwise it may damage electronic controllers.
- DO NOT remove spark plugs when engine is hot; failure to do this may cause damage to spark plug thread holes on cylinder head.
- Before removal, remove dirt and foreign matter around spark plug holes to prevent them from dropping into cylinders.

1. Turn off all electrical equipment and the ignition switch. Wait until engine cools down.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover assembly.
4. Remove the ignition coil (See page 14-8).
5. Remove the spark plug.
   a. Using a special spark plug socket wrench (1), loosen spark plug.
   b. Remove the spark plug (2).

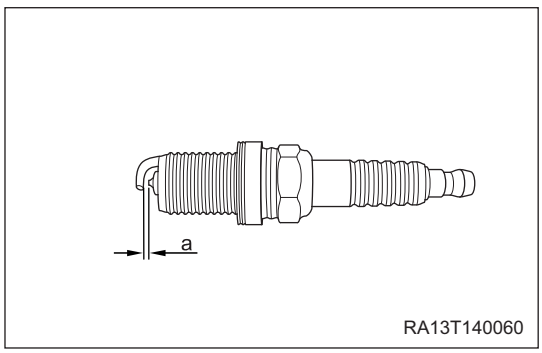


CAUTION

- Be careful not to damage ignition coils when pulling them upward.

Inspection

Check spark plug gap a: 0.8 - 0.9 mm.



Installation

CAUTION

- Check spark plug type to confirm if it is suitable.
- Please install spark plug with a special spark plug socket wrench, and never touch the spark plug socket. DO NOT damage the normal spark plug gap.

1. Install 4 spark plugs respectively into cylinder head mounting holes for pre-tightening, and then retighten spark plugs with a torque wrench.
   (Tightening torque: 20 ± 3 N·m)
2. Other procedures are in the reverse order of removal.

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