

## SQRE4G15B LUBRICATION SYSTEM

<b>GENERAL INFORMATION</b>	<b>13-3</b>	<b>Oil Pressure Switch</b>	<b>13-16</b>
Description	13-3	Removal	13-16
Specifications	13-5	Inspection	13-16
Tools	13-6	Installation	13-17
Lubrication System Flowchart	13-7	<b>Oil Filter Module</b>	<b>13-18</b>
<b>DIAGNOSIS &amp; TESTING</b>	<b>13-8</b>	Removal	13-18
Problem Symptoms Table	13-8	Installation	13-19
Engine Oil Level Inspection	13-9	<b>Oil Pan</b>	<b>13-20</b>
Oil Pressure Inspection	13-10	Removal	13-20
<b>ON-VEHICLE SERVICE</b>	<b>13-12</b>	Installation	13-21
<b>Engine Oil Replacement</b>	<b>13-12</b>	<b>Oil Strainer</b>	<b>13-23</b>
Engine Oil Draining	13-12	Removal	13-23
Engine Oil Adding	13-13	Installation	13-23
<b>Oil Filter Element</b>	<b>13-14</b>	<b>Oil Pump Assembly</b>	<b>13-24</b>
Removal	13-14	Removal	13-24
Installation	13-15	Installation	13-25

# دیجیتال خودرو

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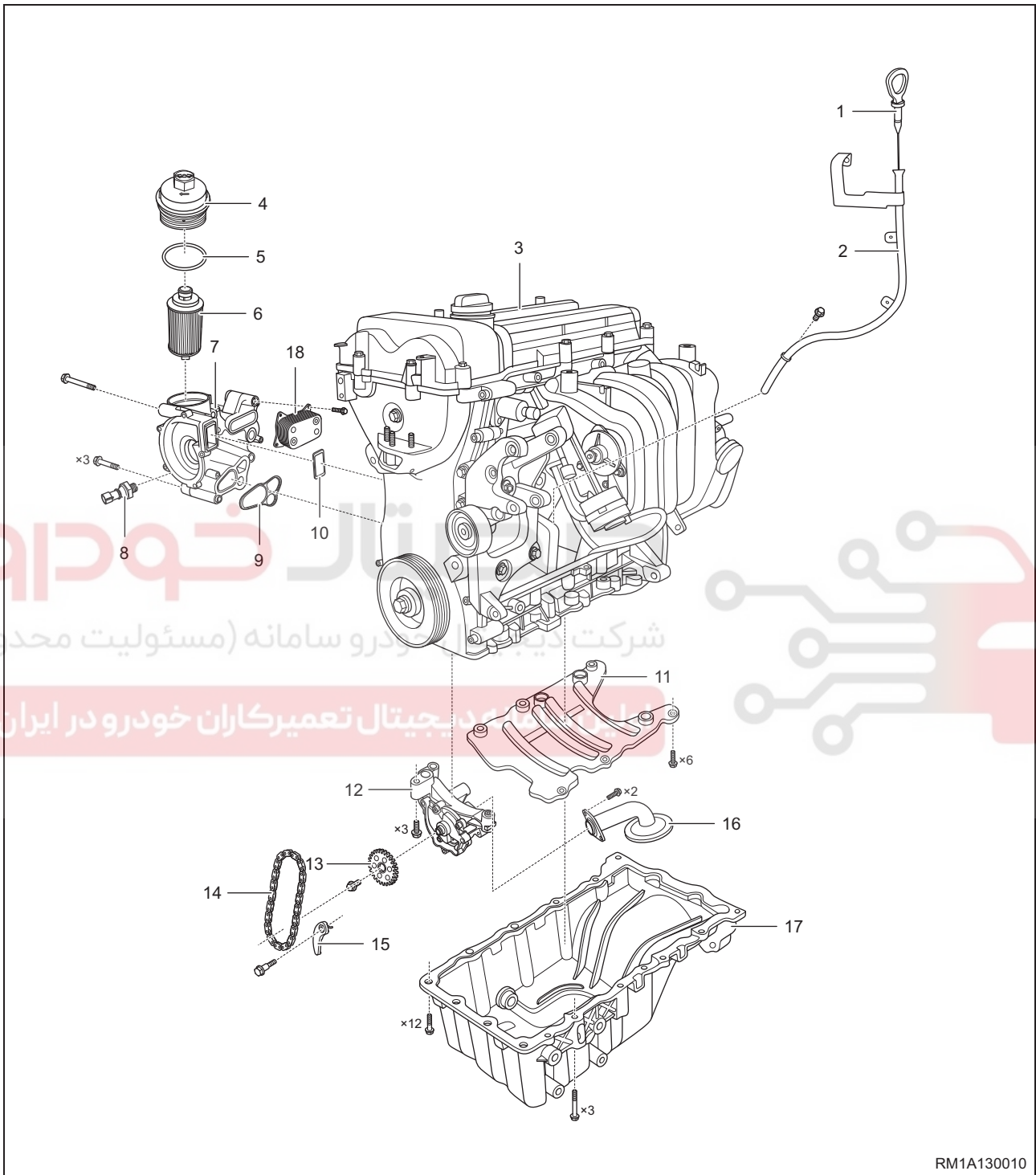
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# GENERAL INFORMATION

## Description



## 13 - SQRE4G15B LUBRICATION SYSTEM

1 - Oil Dipstick	2 - Oil Dipstick Tube
3 - Engine Assembly	4 - Oil Filter Element Cap
5 - Oil Filter Element O-ring	6 - Oil Filter Element
7 - Oil Filter Module	8 - Oil Pressure Switch
9 - Oil Filter Module Gasket	10 - Seal Ring
11 - Oil Pan Deflector	12 - Oil Pump Assembly
13 - Oil Pump Sprocket	14 - Oil Pump Chain
15 - Movable Rail for Oil Pump Chain	16 - Oil Strainer
17 - Oil Pan	18 - Oil Cooler Assembly

Function of lubrication system is that when engine is operating, oil pump that driven by crankshaft, sucks oil from oil pan and pumps it through oil filter. This filtered oil then flows through oil passages, to surfaces of all engine drive parts and forms oil films between moving surfaces to reduce friction and finally returns to the oil pan, thus reducing friction resistance between parts, power consumption, and increasing reliability and durability of engine operation.

 **WARNING**

Prolonged and repeated contact with engine oil will result in removal of natural oils from skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants, which may cause skin cancer.

Precautions should be followed when replacing engine oil to minimize the risk of your skin making contact with used engine oil.

- Wear protective clothing and gloves.
- Wash your skin thoroughly with soap and water, or use waterless hand cleaner to remove any used engine oil from your skin.
- Never use gasoline, thinners or solvents.

## Specifications

### System Pressures

Condition	Pressure (bar)
Low Idling (700 ± 50 r/min)	0.7
High Idling (2000 r/min)	1.8
High Speed (4000 r/min)	3.0

### Oil Specifications

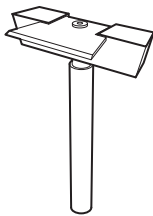
Engine Type	SQRE4G15B
Oil Capacity (L)	4 ± 0.5
Oil Specifications	Summer: SAE 10W - 40 (SM grade or higher) Winter: SAE 5W - 40 (SM grade or higher)

### Torque Specifications

Description	Torque (N·m)
Drain Plug	35 ± 3
Oil Filter Element Cap	20 + 5
Cooling Pipe Assembly I	20 + 5
Oil Filter Module	40 + 5
Coupling Bolt Between Oil Pan and Transmission Case	50 ± 5
Oil Pressure Switch	20 ± 2
Oil Pan Fixing Bolt	20 + 5
Oil Strainer Fixing Bolt	8 + 3
Oil Pump Fixing Bolt	20 + 5
Oil Pump Sprocket Fixing Bolt	20 + 5

## Tools

### Special Tool

Oil Pan Remover and Scraper	 <p>RCH0000056</p>
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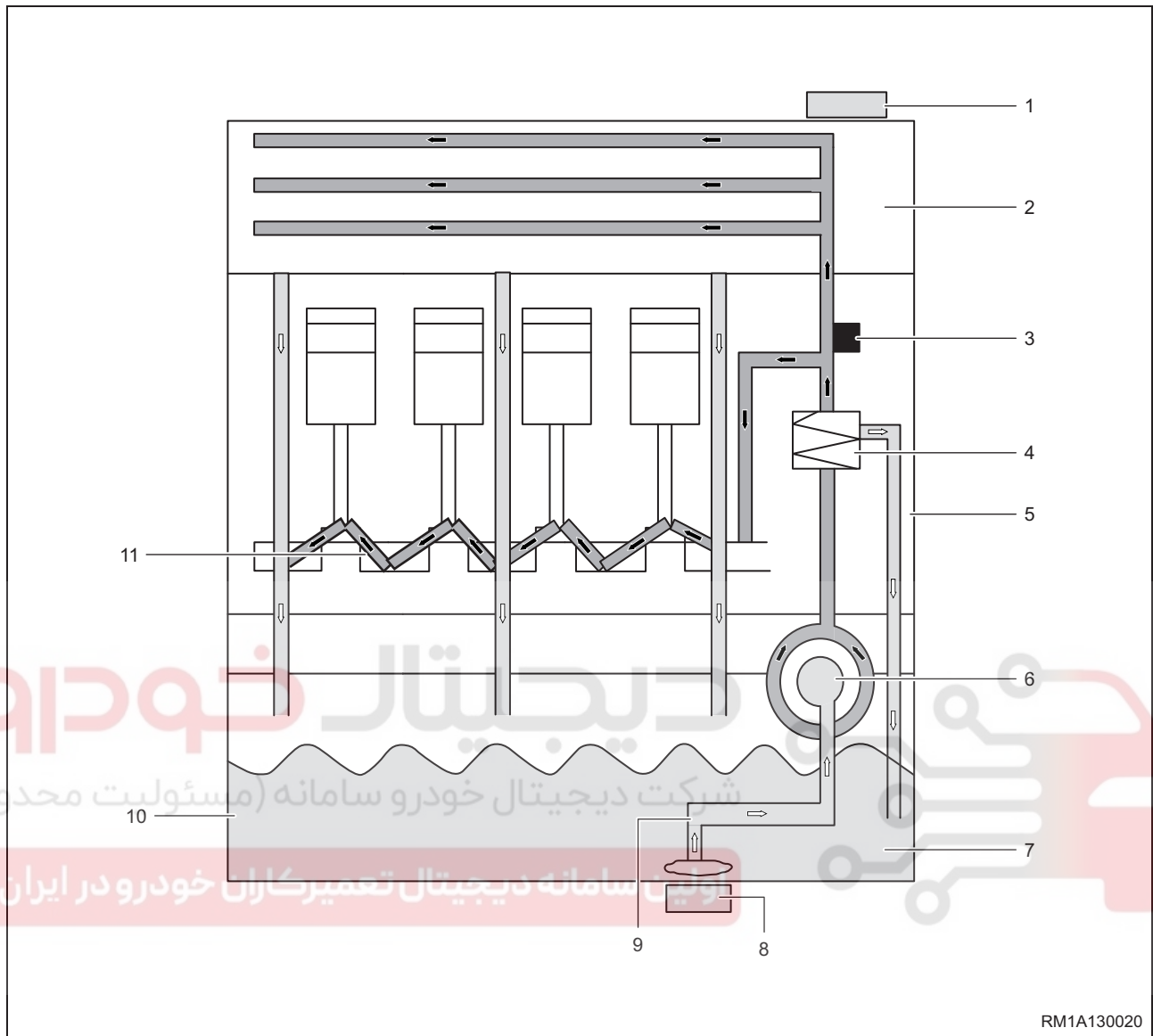
### General Tool

Oil Pressure Tester	 <p>RCH0000006</p>
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Lubrication System Flowchart



1 - Oil Filler Cap	2 - Cylinder Head
3 - Oil Pressure Switch	4 - Oil Filter
5 - Cylinder Block	6 - Oil Pump
7 - Engine Oil	8 - Drain Plug
9 - Oil Strainer	10 - Oil Pan
11 - Crankshaft	

Description

1. Solid arrow: indicates flow of high-pressure lubricant.
2. Hollow arrow: indicates flow of low-pressure lubricant.
3. Dark area: indicates high-pressure lubricant.
4. Bright area: indicates low-pressure lubricant.

## 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
Low pressure in lubrication system	Oil pan (dirty, leakage)	13-20
	Oil strainer (mesh dirty, blocked)	13-23
	Oil pump	13-24
	Line (blocked)	-
High oil consumption	Engine oil (excessive oil filling capacity)	13-9
	Oil filter module (leakage)	13-18
	Crankshaft front oil seal (damaged)	07-27
	Crankshaft rear oil seal (damaged)	07-31
	Oil pressure switch	13-16
	Oil drain plug (leakage)	13-12
	Oil pan (leakage)	13-20
	Engine oil leakage (cylinder head gasket damaged)	07-46
Each engine seal surface leakage	-	
Oil pressure warning light comes on	Engine oil (insufficient oil, low oil viscosity)	13-12
	Oil filter element (blocked)	13-14
	Oil strainer (blocked)	13-23
	Crankshaft front oil seal (damaged)	07-27
	Crankshaft rear oil seal (damaged)	07-31
	Oil pressure switch (damaged)	13-16
	Instrument cluster (oil pressure warning light)	39-49
	Cylinder block (cracks occur in water jacket, resulting in coolant leaking into oil pan, which will cause oil dilution)	07-66
Line (blocked)	-	
After engine cranked, engine produces clunk sound	Engine oil (high oil viscosity, excessive oil filling capacity)	13-12
	Cylinder block (oil passage blocked)	07-66

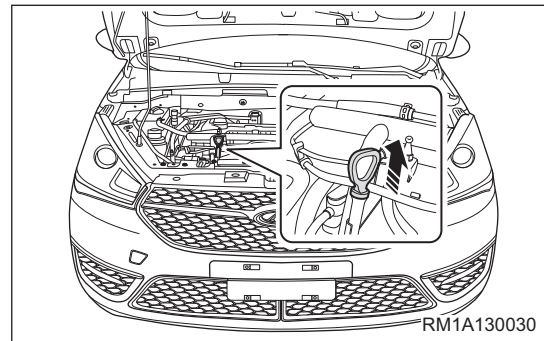


## Engine Oil Level Inspection

### HINT:

Check oil level indicated by oil dipstick, when engine is stopped after it reaches operating temperature.

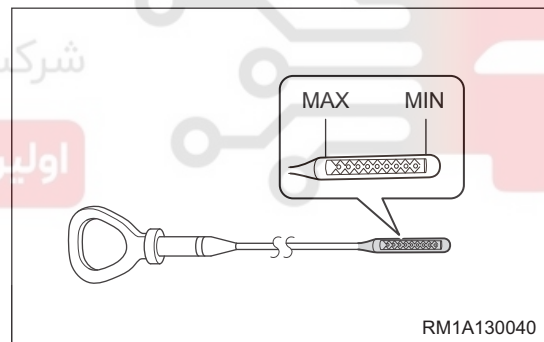
1. Park vehicle on level ground, stop engine after warming up and wait for 5 minutes.
2. Open hood, pull out oil dipstick in direction of arrow as shown in illustration, and wipe it clean with a piece of cloth.



### CAUTION

- Please put a piece of cloth under oil dipstick end, to prevent oil from splashing onto engine or body.

3. Reinsert oil dipstick and check if oil level is proper.
4. Pull out oil dipstick again and check if oil level is proper.  
If engine oil level is too low, check for leakage and add oil up to the full level mark.
  - a. If oil level is at or above "MAX" mark, drain excessive engine oil.
  - b. If oil level is between "MIN" mark and "MAX" mark, it shows that oil level is proper.
  - c. If oil level is below "MIN" mark, it is necessary to add engine oil.



13

### CAUTION

- When adding engine oil, oil level should not be above "MAX" mark.

## Oil Pressure Inspection

### ⚠ WARNING

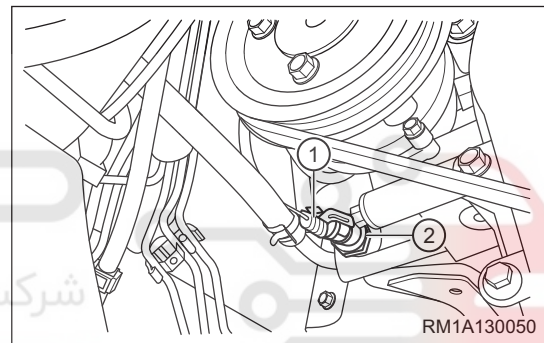
- DO NOT remove oil pressure switch until engine cools down.
- Prolonged and repeated contact with engine oil will be harmful to your skin. If engine oil spills on your skin, wash it off immediately with water. In addition, used engine oil contains potentially harmful contaminants, which may cause skin cancer. Therefore, always take proper skin protection measures when servicing vehicle.

### Preconditions

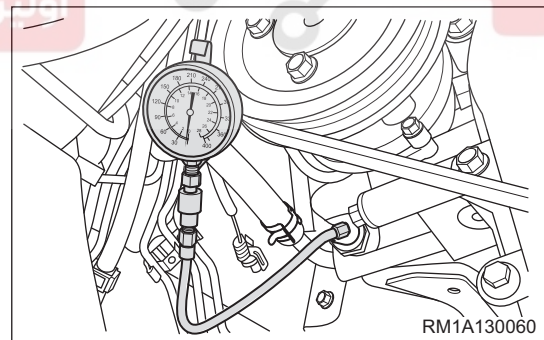
1. Engine oil level is proper.
2. Oil filter is used within 5000 km.
3. Engine reaches the normal operating temperature.

### Inspection

1. Remove the front bumper lower protector (See page 49-20).
2. Disconnect oil pressure switch connector (1) and remove oil pressure switch (2).  
(Tightening torque:  $20 \pm 2$  N·m)



3. Screw oil pressure tester into threaded hole of oil pressure switch as shown in illustration.



4. Start the engine. When engine inspection conditions are met, read oil pressure values at low idling speed, high idling speed and high speed respectively. If lubrication system pressure is low, clean oil pan and oil strainer mesh, and then test again. If lubrication system pressure is still low, it shows there is a malfunction in oil pump and the oil pump must be replaced.

Oil pressure at low idling speed (700 ± 50 r/min): 1 bar;

Oil pressure at high idling speed (2000 r/min): 1.8 bar;

Oil pressure at high speed (4000 r/min): 3.0 bar.

5. Install the oil pressure switch.

**HINT:**

Apply a small amount of seal gum to threads when installing oil pressure switch.

6. Connect oil pressure switch connector and check engine oil for leakage.
7. Install the front bumper lower protector.

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## ON-VEHICLE SERVICE

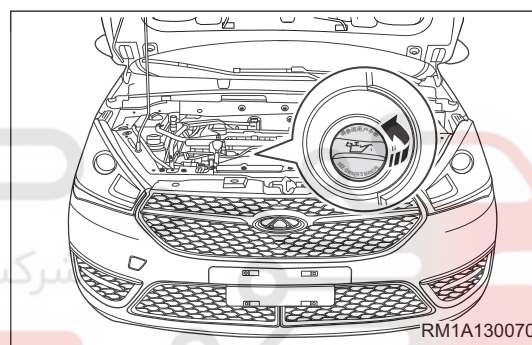
### Engine Oil Replacement

#### Engine Oil Draining

##### WARNING

- DO NOT drain engine oil until engine cools down.
- Prolonged and repeated contact with engine oil will be harmful to your skin. If engine oil spills on your skin, wash it off immediately with water. In addition, used engine oil contains potentially harmful contaminants, which may cause skin cancer. Therefore, always take proper skin protection measures when servicing vehicle.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Open the oil filler cap.
  - a. Rotate oil filler cap counterclockwise to open it.

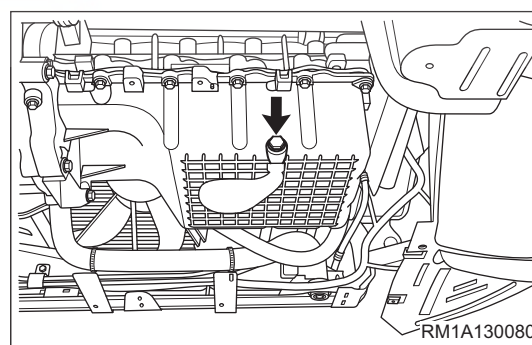


13

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4. Raise vehicle to a proper position.
5. Unscrew drain plug (arrow), and drain oil into a container.



##### WARNING

- Apply a certain pushing force to drain plug while loosening plug by hand, and have drain plug attached to thread tightly to prevent oil from flowing out in advance. As plug is unscrewed, quickly move your hand away, to prevent it been burnt by the hot oil.

### ENVIRONMENTAL PROTECTION

- Wasted engine oil should be handled by specialized department according to local laws and regulations. Never discard it at will.

- Wipe off drain plug and tighten it.  
(Tightening torque:  $35 \pm 3$  N·m)

### CAUTION

- Replace drain plug washer with a new one before installation.

## Engine Oil Adding

Only use engine oil that meets Chery specifications.

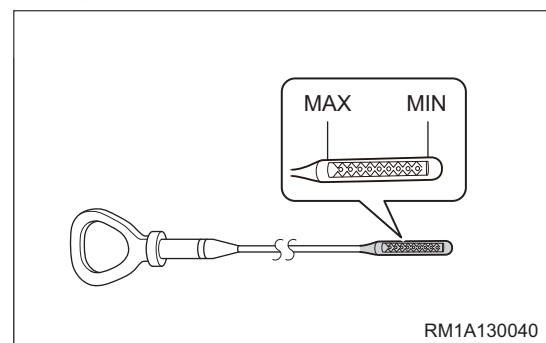
<b>Engine Type</b>	SQRE4G15B
<b>Oil Capacity (L)</b>	$4 \pm 0.5$
<b>Oil Specifications</b>	Summer: SAE 10W - 40 (SM grade or higher) Winter: SAE 5W - 40 (SM grade or higher)

### CAUTION

- DO NOT use inferior engine oil.
- DO NOT mix different types of engine oil.
- Be careful not to spill engine oil on any part of engine, when adding engine oil.

13

- Add a proper amount of oil, and check that oil level is between "MIN" mark and "MAX" mark with oil dipstick.



- Turn off engine after running for 1 to 2 minutes, park vehicle on a level surface and wait for approximately 5 minutes. Check if oil level is between "MIN" mark and "MAX" mark. Refill oil if necessary.
- Check vehicle for oil leakage after replacing oil.

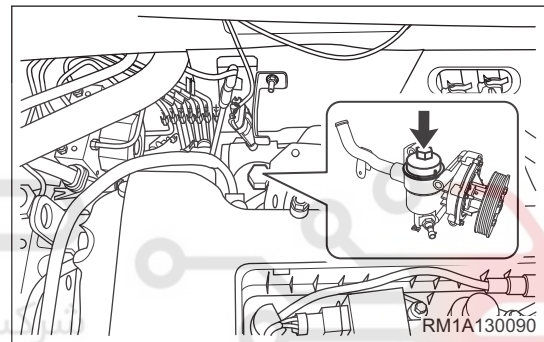
## Oil Filter Element

### Removal

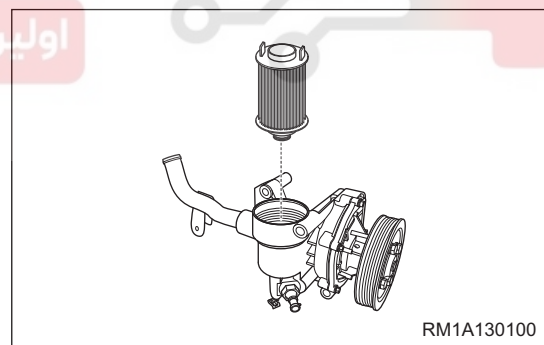
#### WARNING

- DO NOT remove oil filter element until engine cools down.
- Prolonged and repeated contact with engine oil will be harmful to your skin. If engine oil spills on your skin, wash it off immediately with water. In addition, used engine oil contains potentially harmful contaminants, which may cause skin cancer. Therefore, always take proper skin protection measures when servicing vehicle.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Drain the engine oil (See page 13-12).
4. Remove the oil filter element.
  - a. Remove the oil filter element cap (arrow).  
(Tightening torque: 20 + 5 N·m)



- b. Remove oil filter element from oil filter module.



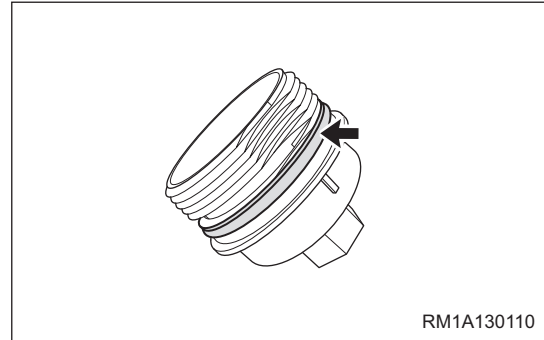
#### CAUTION

- Place removed oil filter element in a tray, to prevent oil from splashing onto engine and body.

#### ENVIRONMENTAL PROTECTION

- Removed oil filter should be handled by specialized department according to local laws and regulations. Never discard it at will.

5. Remove oil filter element O-ring (arrow) from oil filter element cap.



## Installation

Installation is in the reverse order of removal.

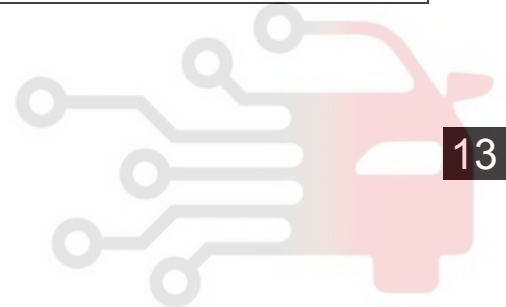
### CAUTION

- Replace oil filter element O-ring with a new one.
- Check oil filter element cap for damage. Replace cap if there is damage.
- Check and clean installation surface between oil filter element cap and oil filter module.
- Apply a layer of clean engine oil to oil filter element O-ring.
- Slightly rotate oil filter element cap in place, and tighten it until seal ring contacts with oil filter module.

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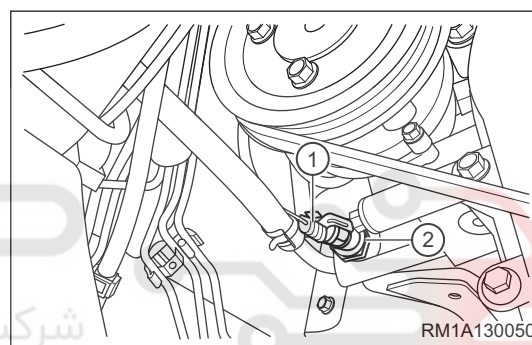
## Oil Pressure Switch

### Removal

#### ⚠ WARNING

- DO NOT remove oil pressure switch until engine cools down.
- Prolonged and repeated contact with engine oil will be harmful to your skin. If engine oil spills on your skin, wash it off immediately with water. In addition, used engine oil contains potentially harmful contaminants, which may cause skin cancer. Therefore, always take proper skin protection measures when servicing vehicle.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the front bumper lower protector (See page 49-20).
4. Remove the oil pressure switch.
  - a. Disconnect the oil pressure switch connector (1).
  - b. Remove the oil pressure switch (2).  
(Tightening torque:  $20 \pm 2$  N·m)



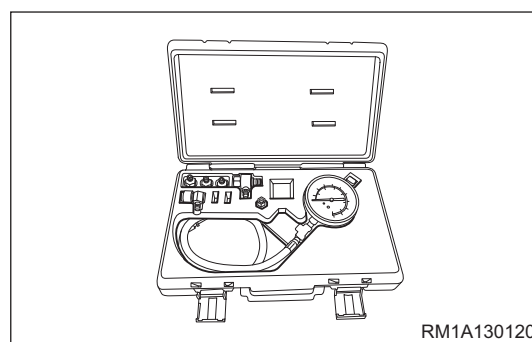
13

### Inspection

#### 👁 CAUTION

- Before inspecting oil pressure switch, please make sure that oil level is correct, coolant temperature is above  $90^{\circ}\text{C}$ , oil filter is used within 5000 km and cooling fan has stopped operating.

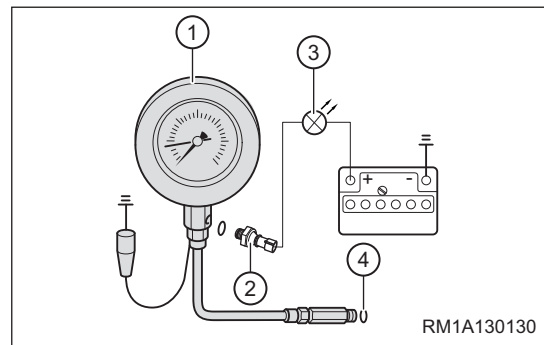
1. Use an oil pressure tester as shown in illustration.





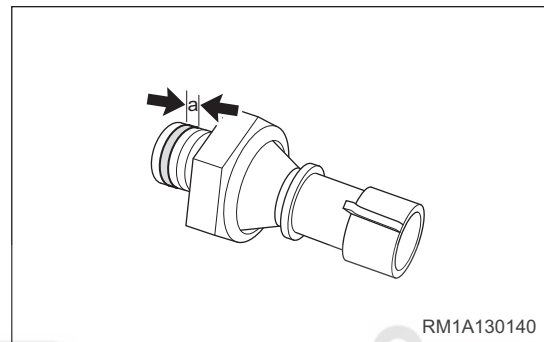
13 - SQRE4G15B LUBRICATION SYSTEM

2. Install oil pressure tester into threaded hole (4) of oil pressure switch as shown in illustration.
3. Install oil pressure switch (2) onto tester (1) and connect oil pressure switch connector.
4. Connect oil pressure switch to body.
5. Start engine and oil pressure warning light (3) comes on, then observe pressure reading on tester. If warning light still comes on when oil pressure is higher than 75 kPa, replace oil pressure switch.



**Installation**

1. Remove oil and impurities on oil pressure switch and its threaded hole.
2. Apply a small amount of seal gum to threads when installing oil pressure switch as shown in illustration.  
Width of a: 3 mm



3. Other installation procedures are in the reverse order of removal.

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## Oil Filter Module

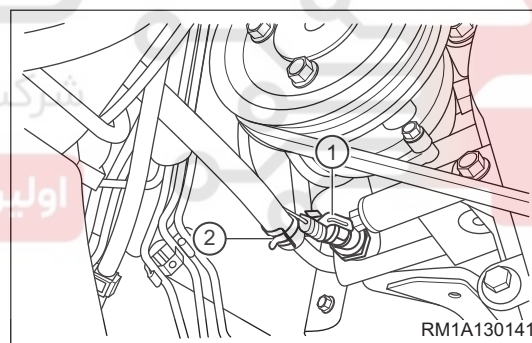
### Removal

#### ⚠ WARNING

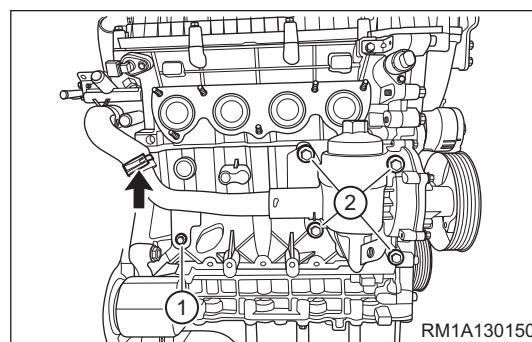
- DO NOT remove oil filter module until engine cools down.
- There will be residual coolant in engine, if your skin contacts coolant directly, clean it with water immediately. If it is serious, please go to hospital.
- Prolonged and repeated contact with engine oil will be harmful to your skin. If engine oil spills on your skin, wash it off immediately with water. In addition, used engine oil contains potentially harmful contaminants, which may cause skin cancer. Therefore, always take proper skin protection measures when servicing vehicle.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the front bumper lower protector (See page 49-20).
4. Move away the accessory drive belt (See page 07-20).
5. Drain the engine oil (See page 13-12).
6. Drain the coolant (See page 12-13).
7. Remove the exhaust manifold assembly (See page 11-6).
8. Remove the oil filter module.

- a. Disconnect the oil pressure switch connector (1).
- b. Loosen elastic clamp (2), and disconnect connection between expansion tank outlet hose and cooling pipe assembly I.

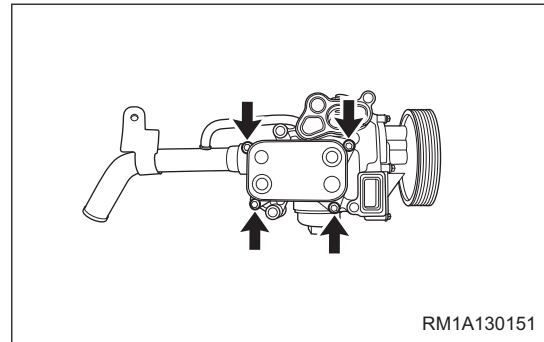


- c. Loosen elastic clamp (arrow), and disconnect connection between small circulation hose and cooling pipe assembly I.
- d. Remove the coolant pipe assembly I fixing bolt (1). (Tightening torque: 20 + 5 N·m)
- e. Remove 4 fixing bolts (2) from oil filter module. (Tightening torque: 40 + 5 N·m)



- f. Remove water pump and cooling pipe assembly I from oil filter module.

g. Remove 4 fixing bolts (arrow) and oil cooler assembly.



## Installation

Installation is in the reverse order of removal.

### CAUTION

- Clean installation surface of oil filter module.
- Check if oil filter module gasket is installed to correct position.
- Check oil filter module gasket for damage or deterioration. If there is damage or deterioration, replace the gasket.
- Add engine oil to specified level.

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## Oil Pan

### Removal

**⚠ WARNING**

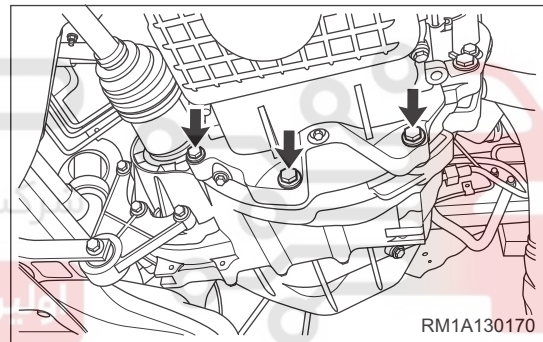
- DO NOT drain oil and remove oil pan until engine cools down.
- Prolonged and repeated contact with engine oil will be harmful to your skin. If engine oil spills on your skin, wash it off immediately with water. In addition, used engine oil contains potentially harmful contaminants, which may cause skin cancer. Therefore, always take proper skin protection measures when servicing vehicle. DO NOT remove oil filter until engine cools down.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Recover the refrigerant (See page 30-22).
4. Remove the front bumper lower protector (See page 49-20).
5. Drain the engine oil (See page 13-12).
6. Remove the compressor assembly (See page 30-61).
7. Remove the oil pan.

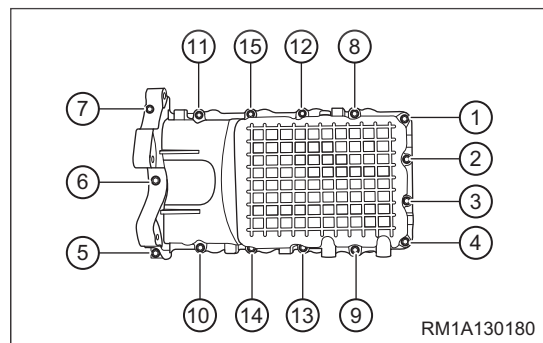
- a. Remove 3 coupling bolts (arrow) between oil pan and transmission case, and remove plate between oil pan and transmission.  
(Tightening torque:  $50 \pm 5$  N·m)

**HINT:**

For CVT model, remove coupling bolt and then remove dust guard.



- b. Remove 15 coupling bolts (arrow) from oil pan in order as shown in illustration.  
(Tightening torque:  $20 + 5$  N·m)



- c. Pry oil pan at specific prying locations on oil pan with oil pan remover and scraper to remove it.

**HINT:**

Because seal gum is used as a seal between oil pan and cylinder block, never use hard objects, such as a hammer, to tap it during removal, but it can be tapped slowly from left and right with a rubber hammer.

**CAUTION**

- Be careful not to damage surrounding parts when removal.
- A transmission carrier can be used to support oil pan during removal, to prevent personal injury from sudden dropping of oil pan.

8. Remove seal gum residues from oil pan and engine frame with oil pan remover and scraper.

**CAUTION**

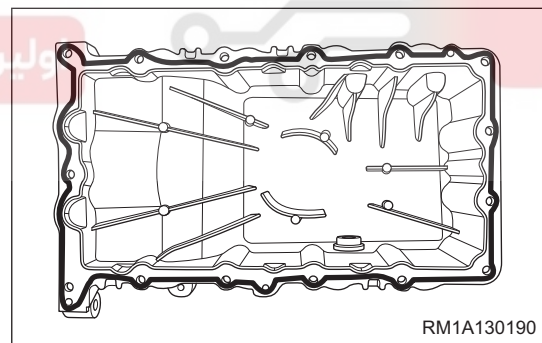
- After removing seal gum with oil pan scraper, clean cylinder block frame installation surface, threaded hole and oil pan with appropriate cleaner.

**Installation****CAUTION**

- When applying seal gum, check type and expiration date of seal gum.
- Remove impurities, iron chips and seal gum residues from oil pan.
- Remove oil stain and seal gum residues from cylinder block and threaded hole of oil pan.
- Seal gum should not be applied too thick; otherwise, it will overflow into oil pan due to squeezing, which will block oil strainer.
- DO NOT add engine oil until seal gum becomes dry after installing oil pan.

1. Uniformly apply seal gum to oil pan installation surface as shown in illustration.

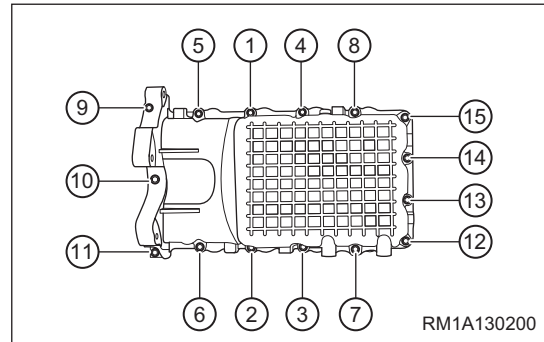
Recommended seal gum: Loctite 5910

**CAUTION**

- Seal gum should be applied to inside of oil pan mounting bolt hole.

13 - SQRE4G15B LUBRICATION SYSTEM

2. Pre-tighten 15 oil pan fixing bolts until oil pan is a press fit, and then tighten bolts in order as shown in illustration. (Tightening torque: 20 + 5 N·m)



3. Other installation procedures are in the reverse order of removal.

**CAUTION**

- DO NOT add engine oil until oil pan seal gum becomes dry.

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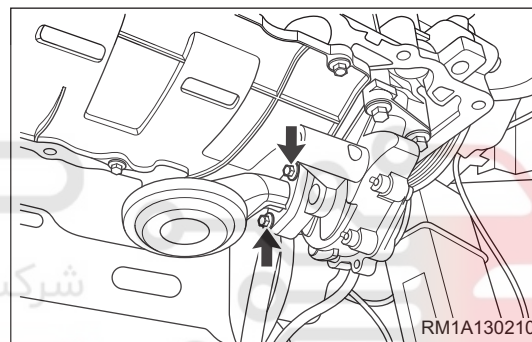
## Oil Strainer

### Removal

#### ⚠ WARNING

- DO NOT drain engine oil until engine cools down.
- Prolonged and repeated contact with engine oil will be harmful to your skin. If engine oil spills on your skin, wash it off immediately with water. In addition, used engine oil contains potentially harmful contaminants, which may cause skin cancer. Therefore, always take proper skin protection measures when servicing vehicle.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Drain the engine oil (See page 13-12).
4. Remove the oil pan (See page 13-20).
5. Remove the oil strainer.
  - a. Remove 2 fixing bolts (arrow) from oil strainer, and then remove oil strainer.  
(Tightening torque: 8 + 3 N·m)



13

- b. Remove oil strainer and its grommet.

### Installation

Installation is in the reverse order of removal.

#### 👁 CAUTION

- Before installing oil strainer, check oil strainer grommet for damage or deterioration. If there is damage or deterioration, replace the grommet.
- Check if oil strainer grommet is installed to correct position.
- Apply a layer of clean engine oil to oil strainer grommet before installation.



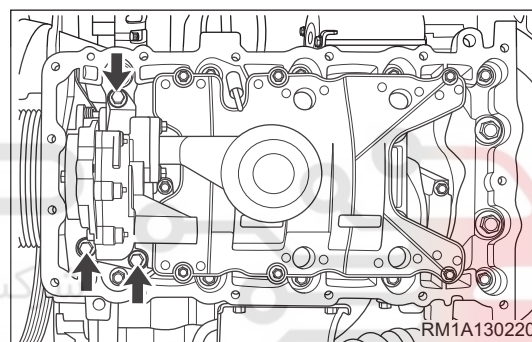
## Oil Pump Assembly

### Removal

#### ⚠ WARNING

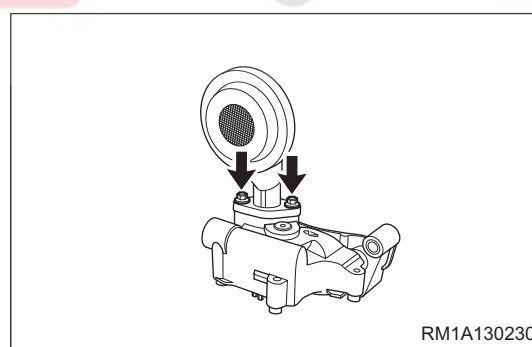
- DO NOT drain engine oil until engine cools down.
- Prolonged and repeated contact with engine oil will be harmful to your skin. If engine oil spills on your skin, wash it off immediately with water. In addition, used engine oil contains potentially harmful contaminants, which may cause skin cancer. Therefore, always take proper skin protection measures when servicing vehicle.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Drain the engine oil (See page 13-12).
4. Remove the oil pan (See page 13-20).
5. Remove the oil pump with oil strainer assembly.
  - a. Remove 3 fixing bolts (arrow) from oil pump assembly.  
(Tightening torque: 20 + 5 N·m)

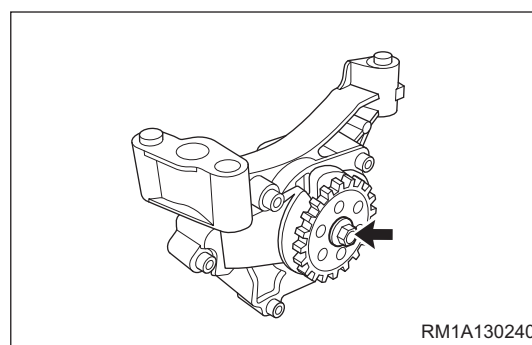


- b. Move away movable rail of oil pump chain and remove oil pump with oil strainer assembly.

6. Remove 2 fixing bolts (arrow) from oil strainer, and then remove oil strainer from oil pump.  
(Tightening torque: 8 + 3 N·m)



7. Remove oil pump sprocket fixing bolt (arrow), and then remove oil pump sprocket from oil pump.  
(Tightening torque: 20 + 5 N·m)





**ENVIRONMENTAL PROTECTION**

- Wasted engine oil should be handled by specialized department according to local laws and regulations. Never discard it at will.

**Installation**

Installation is in the reverse order of removal.

**CAUTION**

- Wasted engine oil should be handled by specialized department according to local laws and regulations. Never discard it at will.

# دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



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