

SQRE4T15B LUBRICATION SYSTEM

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دیجیتال خودرو
شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

دیجیتال خودرو

13 شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

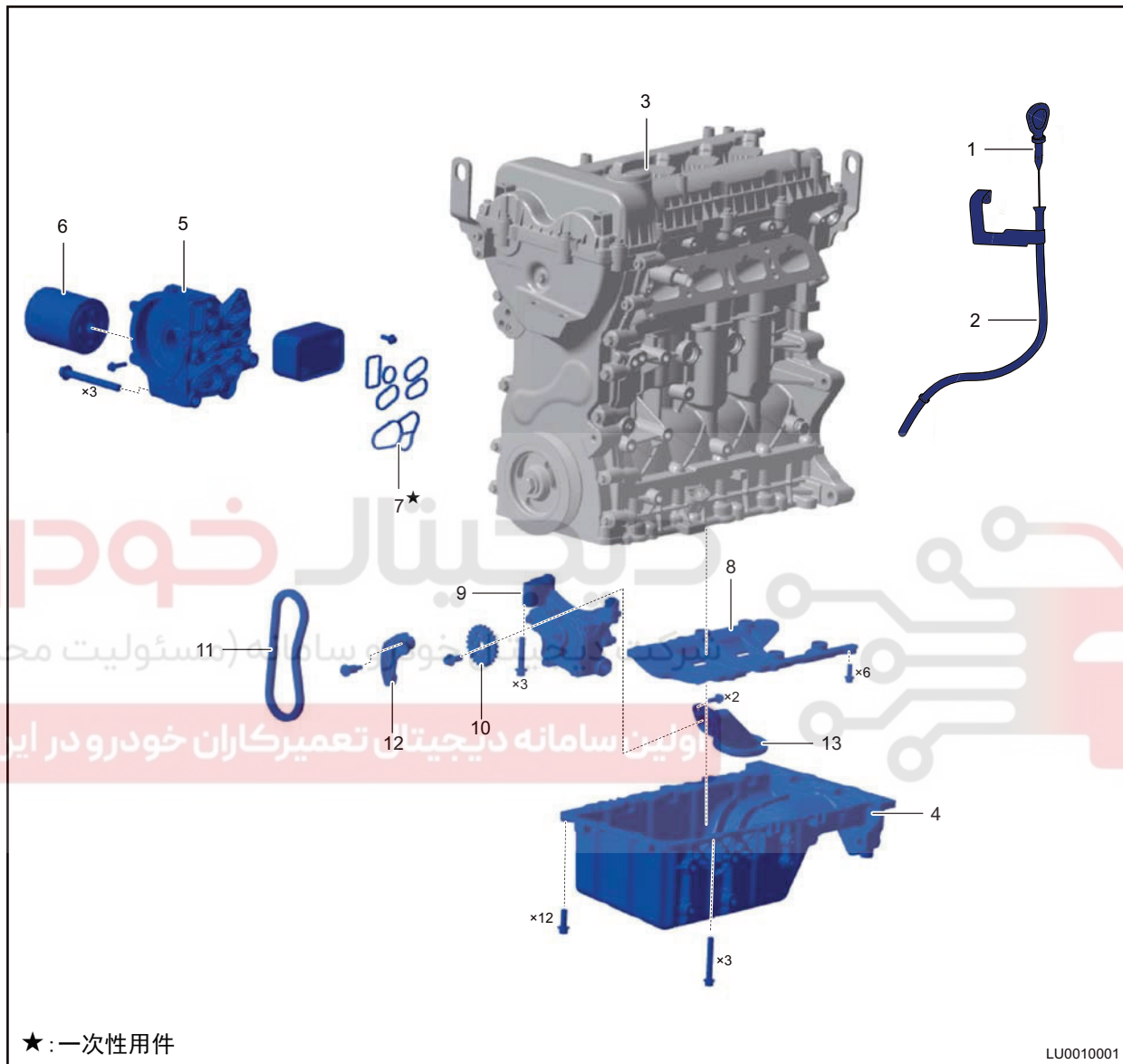
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GENERAL INFORMATION

Overview

Description



1 - Oil Dipstick	2 - Oil Dipstick Tube
3 - Fuel Filler Door	4 - Oil Pan
5 - Oil Filter Module Assembly	6 - Oil Filter Assembly
7 - Gasket	8 - Oil Deflector
9 - Oil Pump Assembly	10 - Oil Pump Sprocket
11 - Oil Pump Drive Chain	12 - Movable Rail for Oil Pump Chain
13 - Oil Strainer	★ - Non-reusable Parts

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Operation

When engine is operating, an oil pump driven by crankshaft, sucks oil from oil pan and pumps it at pressure through an oil filter. This filtered oil then flows through oil passages, to moving 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 drive parts, power consumption and increasing reliability and durability of engine operation.

Warning:

Prolonged and repeated contact with engine oil will result in the removal of natural oils from skin, leading to dryness, irritation and dermatitis. In addition, the 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.
- Never use gasoline, thinners or solvents.

Specifications

System pressure

Status	Pressure (bar)
Idling Speed (700 ± 50 r/min)	Higher than 0.7
High Speed (2000 ± 50 r/min)	Higher than 2.5

Oil

Engine Type	E4T15B
Charging Capacity (L)	Replace oil filter and lubricant at same time: 4.7 ± 0.2
Oil Type	SM SAE-5W-30 SM SAE-5W-40 SM SAE-10W-40
Others	1. If lubricant needs to be added during maintenance, it is recommended to add to middle of upper center of dipstick side oil head. 2. Do not exceed upper line of dipstick while adding lubricant, or it will affect the engine performance.

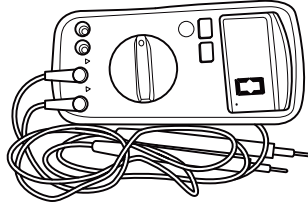
Torque Specifications

Description	Torque (N·m)
Drain Plug	35 ± 3
Oil Filter	22 - 25 or sealing ring contacts with flange, tighten it for 3/4 to 1 turn
Oil Pressure Switch	20 ± 2
Oil Pan Fixing Bolt	20 + 5
Coolant Tube I Assembly Fixing Bolt	20 ± 5
Oil Filter Module Assembly Fixing Bolt	40 + 5
Oil Pump Fixing Bolt	20 + 5
Oil Dipstick Tube Fixing Bolt	8 + 3

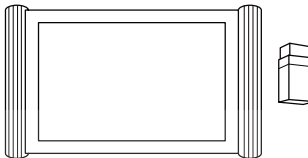
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Tools

General Tool

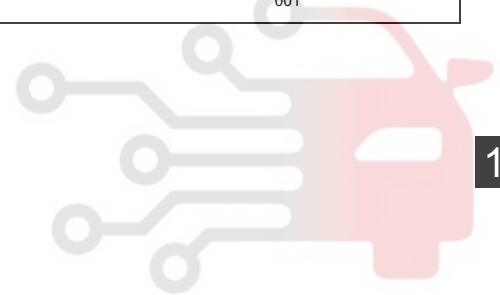
Digital Multimeter	 002
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Special Tool

X-431 PAD Diagnostic Tester	 001
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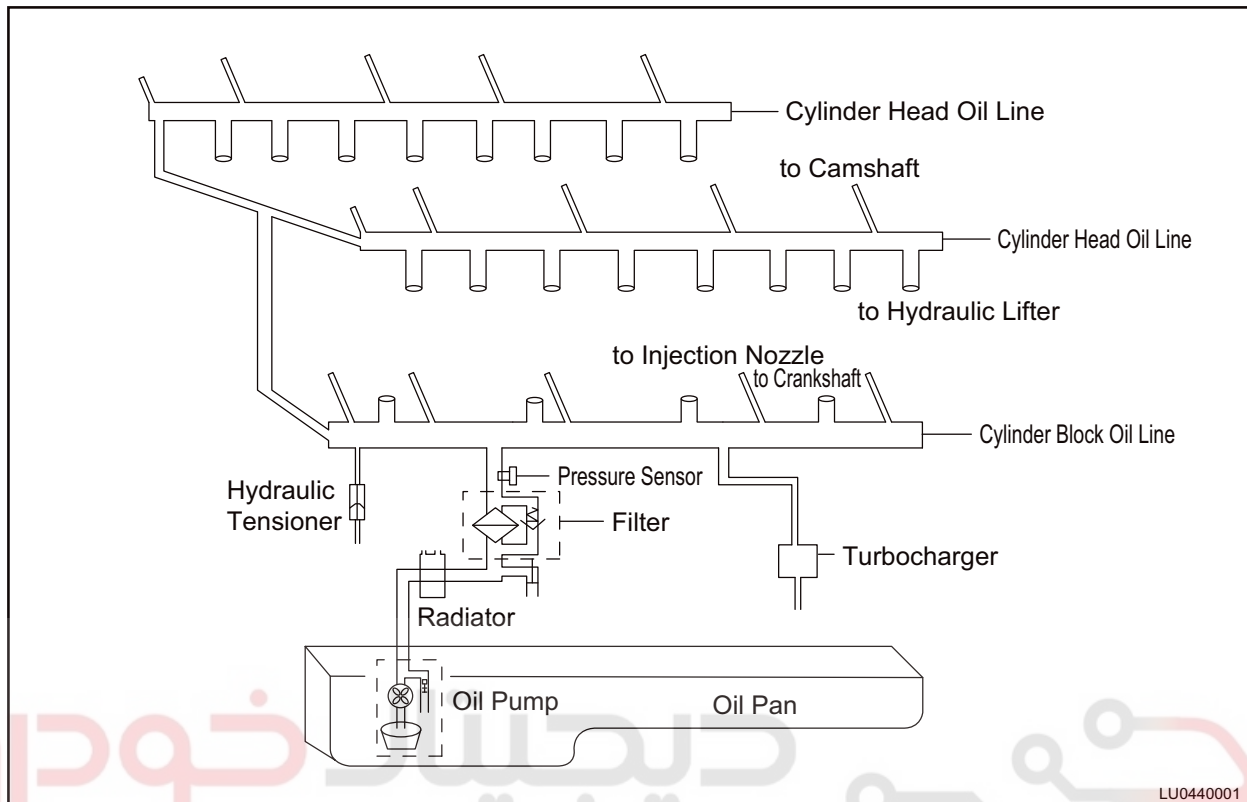
DIAGNOSIS & TESTING**Diagnosis Content****Problem Symptoms Table****Hint:**

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

Symptom	Suspected Area
Low pressure in lubrication system	Oil pan (dirty, leaked)
	Oil strainer (mesh dirty, blocked)
	Oil pump
	Line (blocked)
High pressure in lubrication system	Oil with high viscosity
	Oil passages blocked
	By-pass valve stuck
Mix oil with water	Oil filter module internal leakage
	Cylinder head gasket improperly sealed
	Cylinder block cracks
High oil consumption	Engine oil (excessive oil filling capacity)
	Oil filter module (leaked)
	Crankshaft front oil seal (damaged)
	Crankshaft rear oil seal (damaged)
	Oil Pressure Switch
	Oil drain plug (leaked)
	Oil pan (leaked)
	Engine oil leakage (cylinder head gasket damaged)
	Each engine seal surface leakage
	Engine oil (insufficient oil, low oil viscosity)
Oil pressure warning light comes on	Oil filter element (blocked)
	Oil strainer (blocked)
	Crankshaft front oil seal (damaged)
	Crankshaft rear oil seal (damaged)
	Oil pressure switch (damaged)
	Instrument cluster (oil pressure warning light)
	Cylinder block (cracks occur in water jacket, resulting in coolant leaking into oil pan, which will cause oil dilution)
	Line (blocked)
After engine cranked, engine produces clunk sound	Engine oil (high oil viscosity, excessive oil filling capacity)
	Cylinder block (oil passage blocked)

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Schematic Diagram of Lubrication



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 the engine after warming up and wait for 5 minutes
2. Open the hood and pull out the oil dipstick and wipe it clean with a piece of cloth

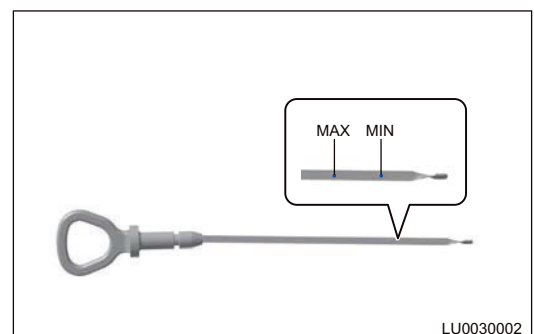
Caution:

- Please put a piece of cloth under the oil dipstick end to prevent oil from splashing onto engine and body.
3. Reinsert the oil dipstick in place and leave it for 3 s to 5 s.
 4. Pull out the oil dipstick again and check if oil level is proper

Hint:

If engine oil level is too low, check for leakage and add oil up to the level mark

- (a) If oil level is at or above the "MAX" mark, drain the excessive engine oil.



- (b) If oil level is between "MIN" mark and "MAX" mark, it shows that oil level is proper.

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(c) If oil level is below the "MIN" mark, it is necessary to add engine oil.

Caution:

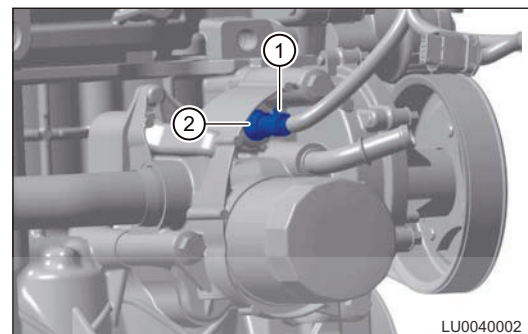
- When adding engine oil, oil level should not be above the "MAX" mark.
- Do not start the engine during the measurement.

Oil Pressure Inspection**Preconditions**

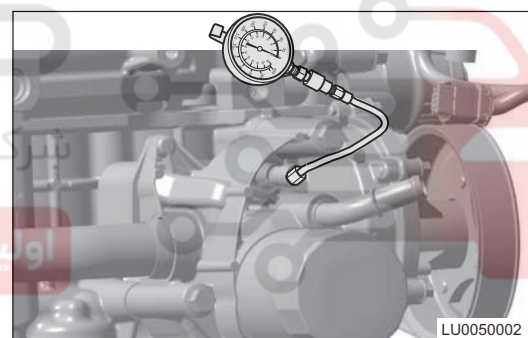
1. Engine oil level is normal
2. Oil filter is used within 5000 km
3. Engine reaches the normal operating temperature

Inspection

1. Disconnect the oil pressure switch connector (1) and remove the oil pressure switch (2).



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



3. Start the engine. When the engine inspection conditions are met, read the oil pressure values at idling speed and high speed respectively.
If lubrication system pressure is low, clean the oil pan and oil strainer mesh, and then test again. If lubrication system pressure is still low, replace the oil pump assembly.
Oil pressure at idling speed (700 ± 50 r/min): above 0.7 bar.
Oil pressure at high speed (2000 ± 50 r/min): above 2.5 bar.

4. Install the oil pressure switch.

Hint:

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

5. Connect the oil pressure switch connector and check engine oil for leakage.

ON-VEHICLE SERVICE

Engine Oil Replacement

Drain the engine oil

Warning/Caution/Hint

Warning:

- DO NOT drain engine oil until engine cools down. Wait for the engine cool down completely.
- Prolonged and repeated contact with engine oil will result in the removal of natural oils from skin, leading to dryness, irritation and dermatitis. In addition, the used engine oil contains potentially harmful contaminants, which may cause skin cancer. Therefore, always take proper skin protection measures when performing vehicle service.

1. Turn off all electrical equipment and the ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Open the oil filler door.
 - (a) Turn the oil filler door counterclockwise to open.
4. Raise vehicle to a proper position.

- (a) Unscrew the drain plug (arrow), and drain the oil into a container.

Caution:

- Apply a certain pushing force to drain plug while loosening the plug by hand, and have the drain plug attached to thread tightly to prevent oil from overflowing in advance. Move away your hand quickly to prevent burn by oil with a certain temperature.

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

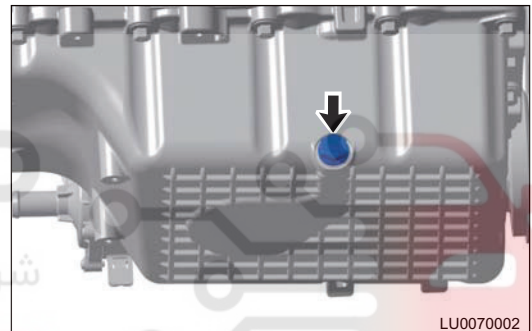
- (b) Wipe off the drain plug and tighten it.

Tightening torque

35 ±3 N·m

Caution:

- The drain plug gasket must be replaced each time the drain plug is removed.



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Engine Oil Adding

1. Only use engine oil that meets Chery specifications.

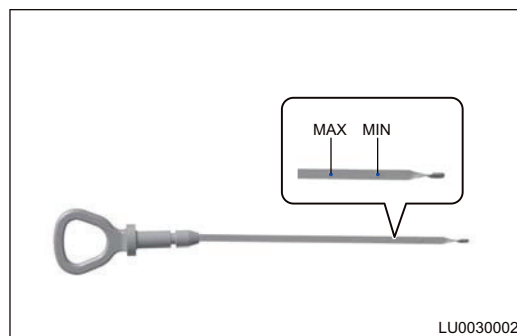
Engine Type	E4T15B
Charging Capacity (L)	Replace oil filter and lubricant at same time: 4.7 ± 0.2
Oil Type	SM-SAE 10W - 40 SM-SAE 5W - 40 SM-SAE 10W - 20

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 the engine when adding engine oil.

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



- (b) Turn off the 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.
- (c) Check the vehicle for leakage after replacing oil.

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Oil Filter

Removal

Warning/Caution/Hint

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, the used engine oil contains potentially harmful contaminants, which may cause skin cancer. Therefore, always take proper skin protection measures when performing vehicle service.

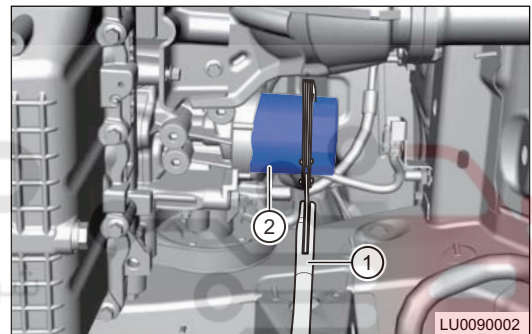
Caution:

- Use oil filter installer when replacing oil filter to avoid deformation.
 - Oil filter is close to exhaust pipe, avoid burns during installation and removal.
1. Turn off all electrical equipment and the ignition switch.
 2. Disconnect the negative battery cable.
 3. Drain the engine oil
 4. Remove the oil filter

- (a) Use oil filter remover (1) to remove the oil filter (2).

Tightening torque

22 - 25 N·m



- (b) Remove the fuel filter assembly.

Caution:

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

Installation

Warning/Caution/Hint

Caution:

- Check and clean installation surface between oil filter and oil filter bracket.
- Apply a coat of clean engine oil to oil filter seal ring.
- Use a special tool to tighten oil filter.

Tightening torque

22 - 25 N·m

- It is necessary to clean oil left on components after installing oil filter.
1. Installation is in the reverse order of removal.

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Oil Pressure Switch

Removal

Warning/Caution/Hint

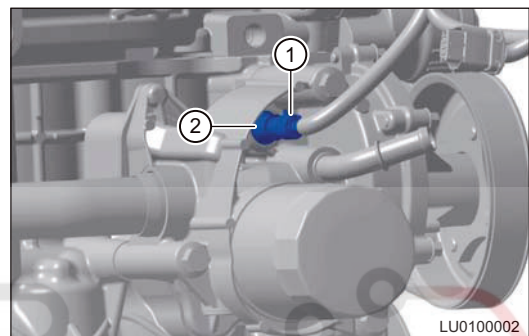
Caution:

- 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, the used engine oil contains potentially harmful contaminants, which may cause skin cancer. Therefore, always take proper skin protection measures when performing vehicle service.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the oil pressure switch

- (a) Disconnect the oil pressure switch connector (1) and remove the oil pressure switch (2).

Tightening torque

 $20 \pm 2 \text{ N}\cdot\text{m}$


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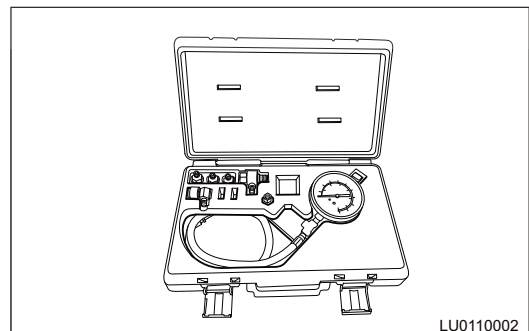
Inspection

Warning/Caution/Hint

Caution:

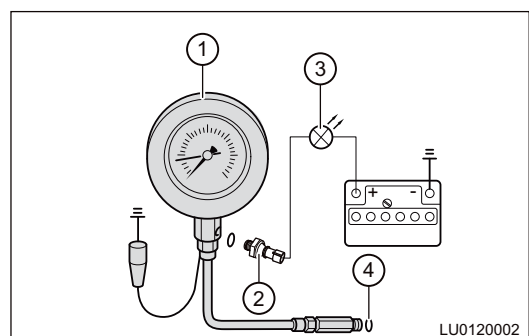
- Before inspecting oil pressure switch, please make sure that oil level is proper and coolant temperature is above 90°C, and that oil filter is used within 5000 km.

1. Inspect the oil pressure switch.
 - (a) Use an oil pressure tester as shown in the illustration.



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- (b) Install the oil pressure tester into the threaded hole (4) of oil pressure switch as shown in the illustration.



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- (c) Install the oil pressure switch (2) onto the tester (1) and connect the LED lamp (3).

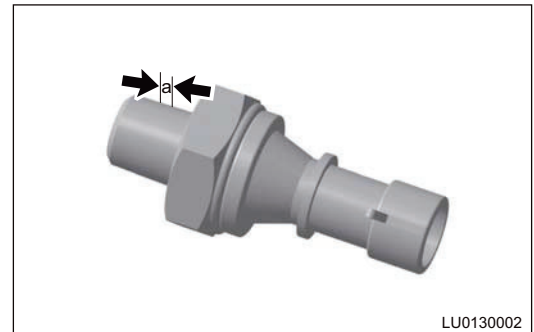
13-SQRE4T15B LUBRICATION SYSTEM

- (d) LED (3) does not turn on when engine is not started. If it turns on, replace the oil pressure switch.
- (e) After starting engine, observe the pressure reading on tester. LED (3) turns on when oil pressure reaches 94 Kpa, if it does not turn on, replace the oil pressure switch.

Installation

1. Remove the oil and impurities on the oil pressure switch and its threaded hole
2. Apply a small amount of seal gum to threads when installing the oil pressure switch

- (a) Use a torque wrench to tighten it to specified torque, as shown in illustration, there is a gap (a) about 2 to 5 mm between oil pressure switch flange surface and oil filter module housing.

Tightening torque $20 \pm 2 \text{ N}\cdot\text{m}$ 

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

Caution:

Apply seal gum on threads when assembling oil pressure switch.

Seal Gum

Loctite 577



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Oil Filter Module Assembly

Removal

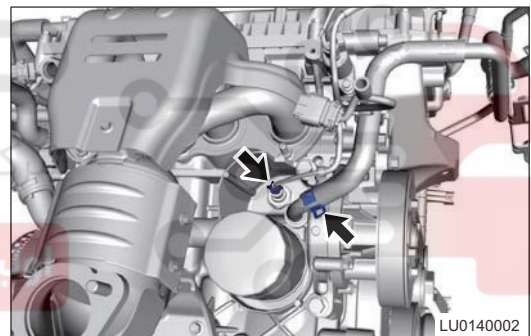
Warning/Caution/Hint

Warning:

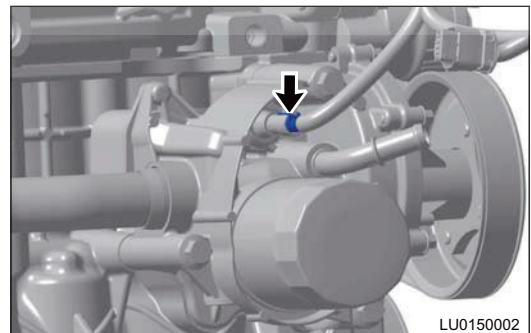
- DO NOT remove oil filter module assembly until engine cools down.
- There will be residual coolant inside engine during removal and installation, if your skin contacts coolant directly, clean it with water immediately. If it is serious, please go to hospital.
- Prolonged and repeated contact with engine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

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 engine accessory belt
5. Drain the oil
6. Drain the coolant.
7. Remove the precatalytic converter assembly (See page 11-16).
8. Remove the oil filter module assembly.

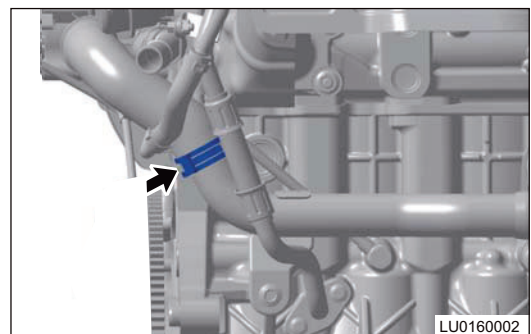
- (a) Loosen elastic clamp (arrow), disconnect connection between water supply hose and oil filter module assembly.



- (b) Disconnect the oil pressure switch connector (arrow).



- (c) Loosen the elastic clamp (arrow) and disconnect connection between small circulation hose and cooling pipe I assembly.

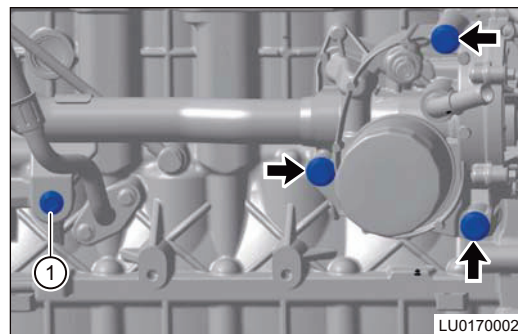


13-SQRE4T15B LUBRICATION SYSTEM

- (d) Remove coupling bolt (1) between cooling pipe assembly I and cylinder block.

Tightening torque

20 + 5 N·m



- (e) Remove 3 oil filter module fixing bolts (arrow).

Tightening torque

40 + 5 N·m

- (f) Remove the oil filter module assembly.

Installation**Warning/Caution/Hint****Caution:**

- Clean installation surface of oil filter module assembly.
 - Seal ring is a disposable part, it need to replace (rubber ring) repair kit.
 - Check if oil filter module assembly seal ring is installed to correct position.
 - Add oil to specified position.
1. Installation is in the reverse order of removal.



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Oil Pan

Removal

Warning/Caution/Hint

Caution:

- 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, the used engine oil contains potentially harmful contaminants, which may cause skin cancer. Therefore, always take proper skin protection measures when performing vehicle service. DO NOT remove oil pan until engine cools down.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Recover the refrigerant
4. Drain the engine oil
5. Remove the engine accessory belt
6. Remove compressor assembly and compressor fixing bracket
7. Remove the electric water pump (See page 12-31).
8. Remove the oil pan assembly.

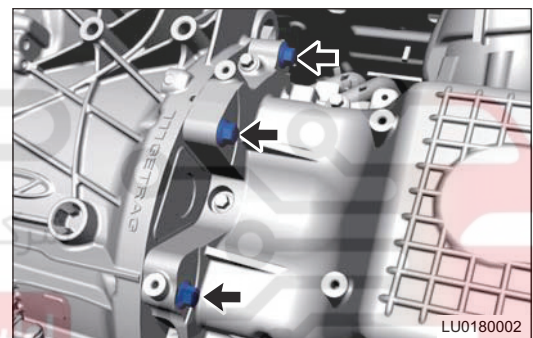
- (a) Remove 3 coupling bolts (arrow) between oil pan assembly and transmission assembly.

Hint:

For CVT mode, remove coupling bolt and then remove dust plate.

Tightening torque

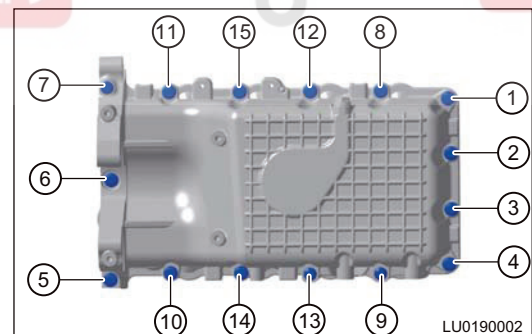
$50 \pm 5 \text{ N}\cdot\text{m}$



- (b) Remove 15 fixing bolts from oil pan in order as shown in illustration.

Tightening torque

$20 + 5 \text{ N}\cdot\text{m}$



- (c) Tap all around oil pan slightly with a rubber hammer, remove oil pan.

Caution:

- Because the seal gum is sealed 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.
 - A transmission carrier can be used to support the oil pan during removal, to prevent personal injury from sudden dropping of oil pan.
 - DO NOT damage or miss dowel pin when removing oil pan.
- (d) Remove the residual seal gum on oil pan and engine frame with flat scraper.

Caution:

- When removing seal gum on installation surface between oil pan and engine frame, threaded hole can be cleaned with cleaner properly.

Installation

Warning/Caution/Hint

Caution:

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

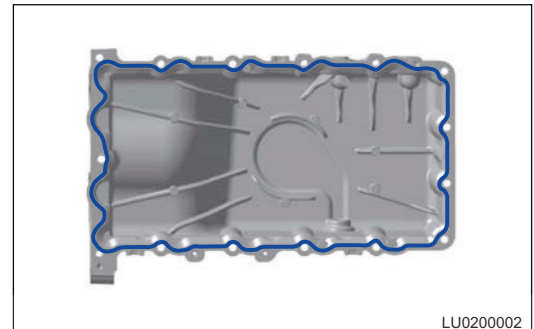
- (a) As shown in illustration, apply seal gum to inside of oil pan installation screw hole evenly.

Recommended seal gum

Loctite 5900H

Seal gum line diameter

1.5 - 3 mm

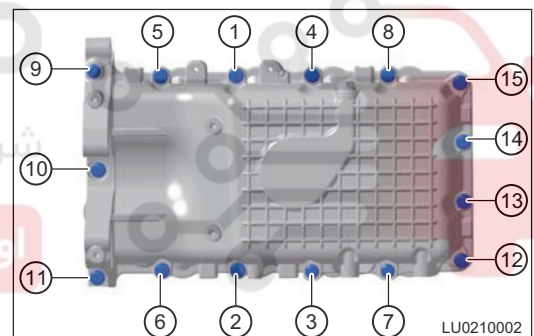


- (b) Align oil pan with frame dowel pin, assemble oil pan and tap it slightly to fit it with frame closely.

- (c) As shown in illustration, pre-tighten oil pan fixing bolts until oil pan is pressed tightly. Then tighten bolts in order.

Tightening torque

20 + 5 N·m



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

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Oil Strainer**Removal****Warning/Caution/Hint****Caution:**

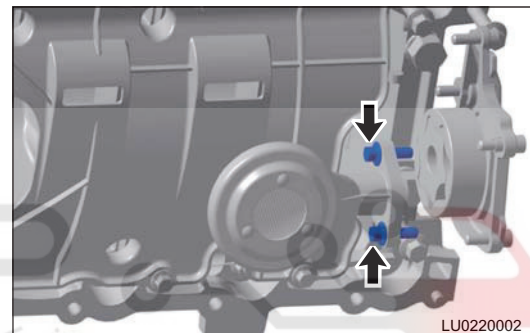
- DO NOT drain engine oil until engine cools down.
- Prolonged and repeated contact with engine oil will be harmful to your skin. If engine oil spills on your skin, wash it off immediately with water. In addition, the used engine oil contains potentially harmful contaminants, which may cause skin cancer.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

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Drain the engine oil
4. Remove the oil pan assembly
5. Remove the oil strainer

- (a) Remove 2 strainer fixing bolts (arrow).

Tightening torque

8 + 3 N·m



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- (b) Remove the oil strainer and seal ring.

Installation**Warning/Caution/Hint****Caution:**

- Oil strainer seal ring is a disposable part. Replace seal ring before installing oil strainer.
- Apply seal gum to fixing bolt threads after installing oil strainer. Ensure application amount for (3~5) tooth.

Seal Gum

Loctite 243

1. Installation is in the reverse order of removal.

Oil Pump Assembly

Removal

Warning/Caution/Hint

Warning:

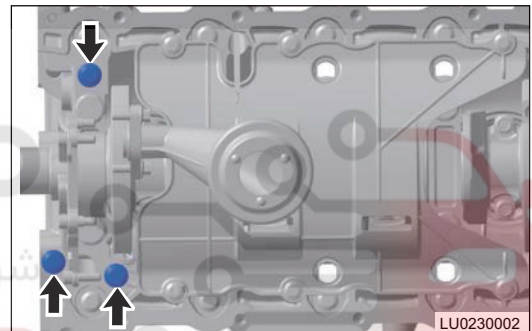
- DO NOT drain engine oil until engine cools down.
- Prolonged and repeated contact with engine oil will be harmful to your skin. If engine oil spills on your skin, wash it off immediately with water. In addition, the used engine oil contains potentially harmful contaminants, which may cause skin cancer.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

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Drain the engine oil.
4. Remove the timing chain assembly.
5. Remove the oil pan assembly.
6. Remove the oil strainer
7. Remove the oil pump assembly

- (a) Remove 3 oil pump assembly fixing bolts (arrow).

Tightening torque

20 + 5 N·m



- (b) Push chain movable rail, move away chain from oil pump assembly, remove oil pump assembly.

Installation

Warning/Caution/Hint

Warning:

- Wasted engine oil pump assembly should be handled by specialized department according to local laws and regulations. Never discard it at will.
- Rotate sprocket clockwise, check if rotation of oil pump is smooth.
- Apply seal gum to fixing bolt threads after installing oil pump. Ensure application amount for (3~5) tooth.

Seal Gum

Loctite 243

1. Installation is in the reverse order of removal.

13-SQRE4T15B LUBRICATION SYSTEM

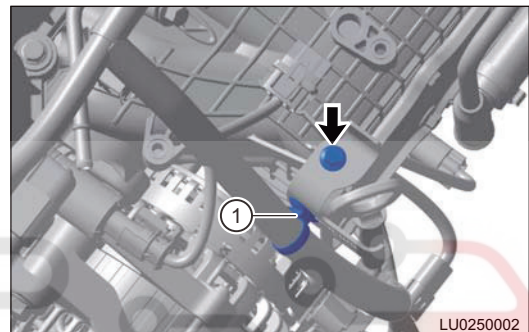
Oil Tube (Dipstick) Assembly**Removal****Warning/Caution/Hint****Warning:**

- 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, the used engine oil contains potentially harmful contaminants, which may cause skin cancer. Therefore, always take proper skin protection measures when performing vehicle service.

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 oil tube assembly.
 - (a) Disconnect the engine wire harness fixing clip (1).
 - (b) Remove coupling bolt (arrow) between oil tube and intake manifold assembly.

Tightening torque

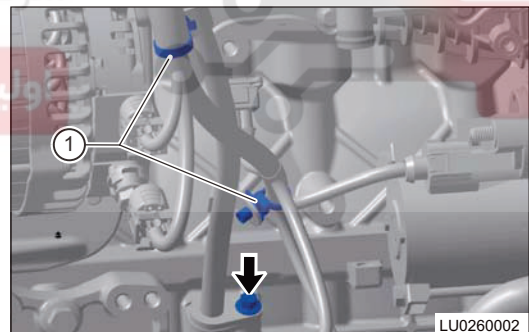
8 + 3 N·m



- (c) Disconnect the engine wire harness fixing clip (1).
- (d) Remove coupling bolt (arrow) between oil tube and engine frame assembly.

Tightening torque

8 + 3 N·m



- (e) Remove the oil tube assembly.

Installation**Warning/Caution/Hint****Caution:**

- Check O-ring before assembly to make sure it is not damaged, otherwise replace with a new one.
 - Apply a small amount of lubricant to O-ring before assembly.
 - When inserting dipstick tube into frame installing hole, insert lower end as far as possible along shaft line direction. If it tilts, it may be difficult to assemble O-ring, even damage O-ring.
1. Installation is in the reverse order of removal.