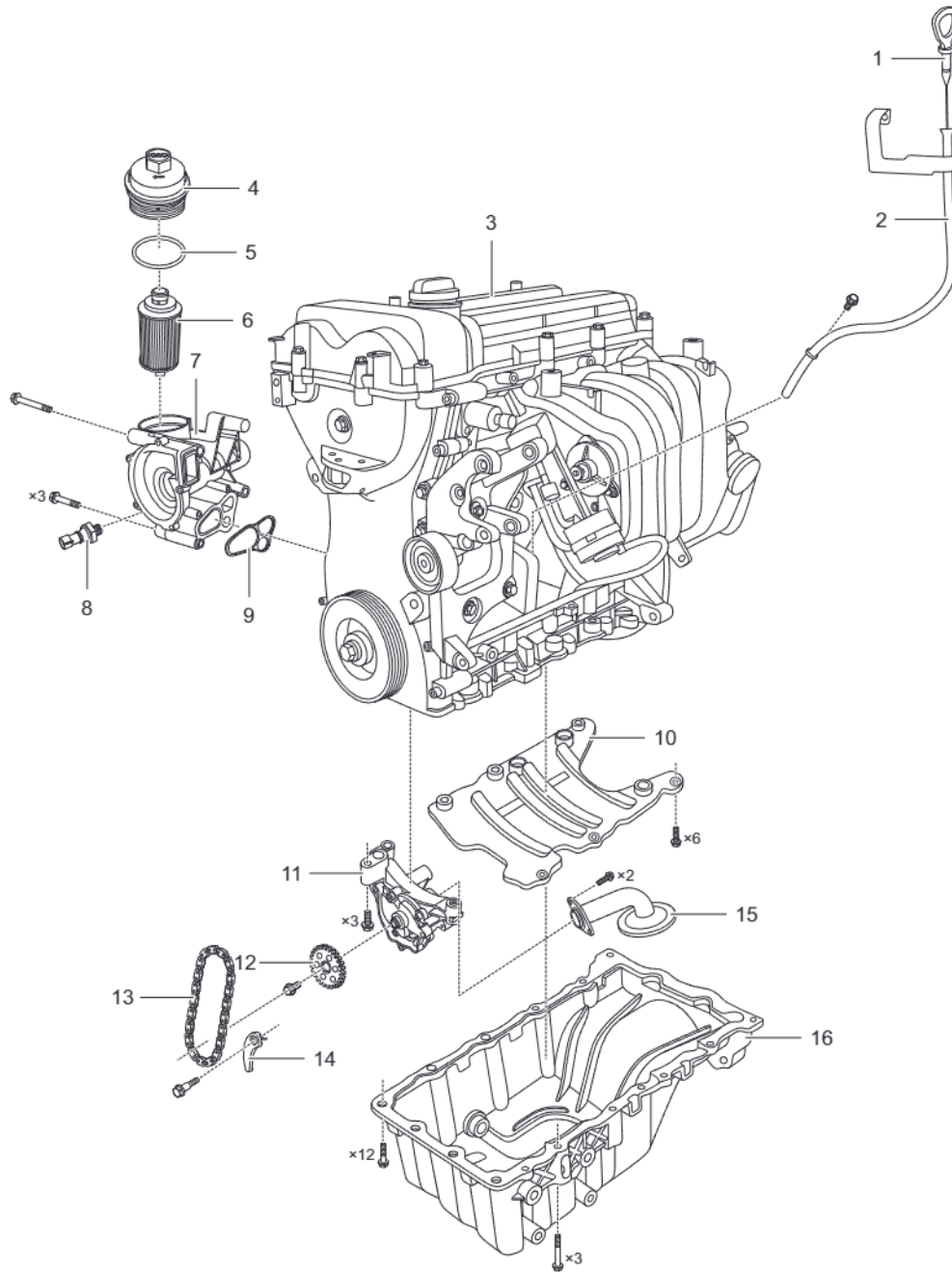

SQRE4G16 LUBRICATION SYSTEM

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GENERAL INFORMATION

Description



RM16130010

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 - Oil Pan Deflector
11 - Oil Pump Assembly	12 - Oil Pump Sprocket
13 - Oil Pump Chain	14 - Movable Rail for Oil Pump Chain
15 - Oil Strainer	16 - Oil Pan

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 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 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 Pressures

Condition	Pressure (bar)
Low Idling Speed (700 ± 50 r/min)	1.0
High Idling Speed (2000 r/min)	1.8
High Speed (4000 r/min)	3.0

Oil Specifications

Engine Type	SQRE4G16
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

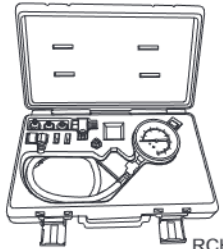
Description	Torque (N·m)
Drain Plug	25 ± 3
Oil Filter Element Cap	20 + 5
Cooling Pipe Assembly I	20 + 5
Oil Filter Module	40 + 5
Coupling Bolt Between Oil Pan and Transmission Case	50 ± 5
Oil Pressure Switch	20 ± 2
Oil Pan Fixing Bolt	20 + 5
Oil Strainer Fixing Bolt	8 + 3
Oil Pump Fixing Bolt	20 + 5
Oil Pump Sprocket Fixing Bolt	20 + 5

Tools

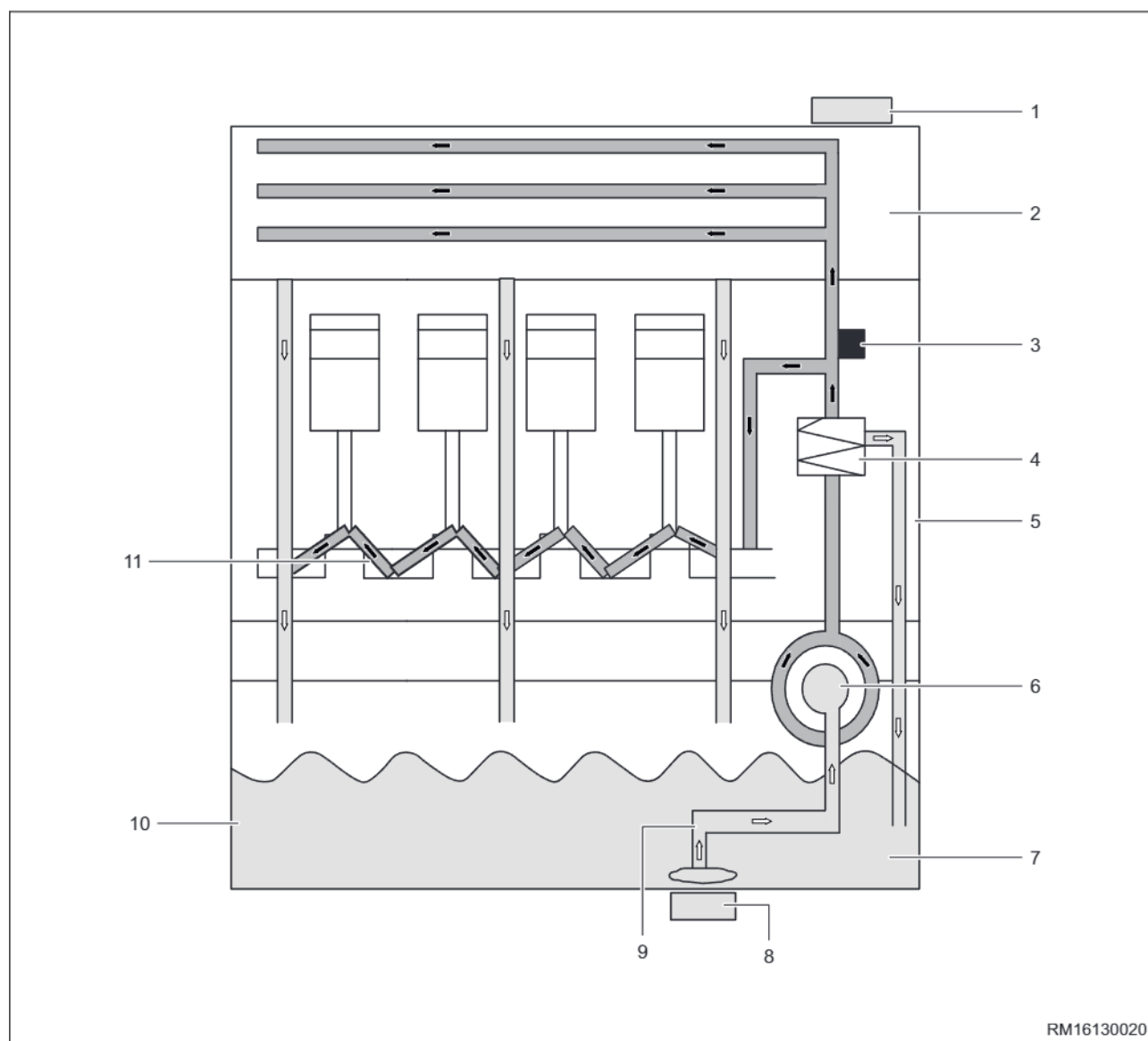
Special Tool

Oil Pan Remover and Scraper	 RCH0000056
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General Tool

Oil Pressure Tester	 RCH0000006
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Lubrication System Flowchart



13

1 - 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.

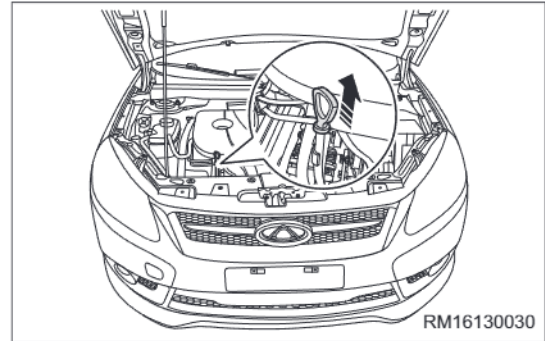
Symptom	Suspected Area	See page
Low pressure in lubrication system	Oil pan (dirty, leaked)	13-20
	Oil strainer (mesh dirty, blocked)	13-23
	Oil pump	13-24
	Line (blocked)	-
High oil consumption	Engine oil (excessive oil filling capacity)	13-9
	Oil filter module (leaked)	13-18
	Crankshaft front oil seal (damaged)	07-32
	Crankshaft rear oil seal (damaged)	07-36
	Oil pressure switch	13-16
	Oil drain plug (leaked)	13-12
	Oil pan (leaked)	13-20
	Engine oil leakage (cylinder head gasket damaged)	07-51
	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)	07-32
	Crankshaft rear oil seal (damaged)	07-36
	Oil pressure switch (damaged)	13-16
	Instrument cluster (oil pressure warning light)	39-77
	Cylinder block (cracks occur in water jacket, resulting in coolant leaking into oil pan, which will cause oil dilution)	07-74
	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)	07-74

Engine Oil Level Inspection

HINT:

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

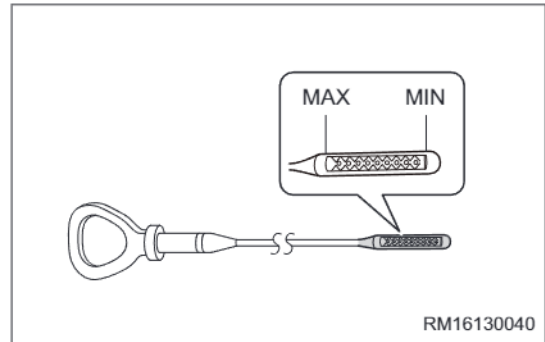
1. Park vehicle on level ground, stop the engine after warming up and wait for 5 minutes.
2. Open the hood and pull out the oil dipstick in the direction of arrow as shown in the illustration, and wipe it clean with a piece of cloth.



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.
4. Pull out the 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 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.
 - c. If oil level is below the "MIN" mark, it is necessary to add engine oil.



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CAUTION

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

Oil Pressure Inspection

WARNING

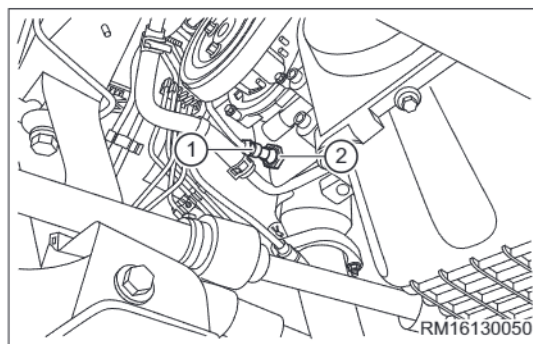
- DO NOT remove oil pressure switch until engine cools down.
- Prolonged and repeated contact with engine oil will be harmful to your skin. If engine oil spills on your skin, wash it off immediately with water. In addition, the used engine oil contains potentially harmful contaminants, which may cause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

Preconditions

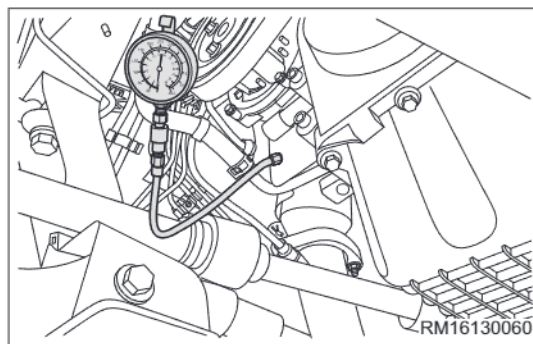
1. Engine oil level is normal.
2. Oil filter is used within 5000 km.
3. Engine reaches the normal operating temperature.

Inspection

1. Remove the engine lower protector assembly ([See page 49-22](#)).
2. Disconnect the oil pressure switch connector (1) and remove the oil pressure switch (2).
(Tightening torque: $20 \pm 2 \text{ N}\cdot\text{m}$)



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



4. Start the engine. When the engine inspection conditions are met, read the oil pressure values at low idling speed, high 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, it shows there is a malfunction in the 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 the oil pressure switch.

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

ON-VEHICLE SERVICE

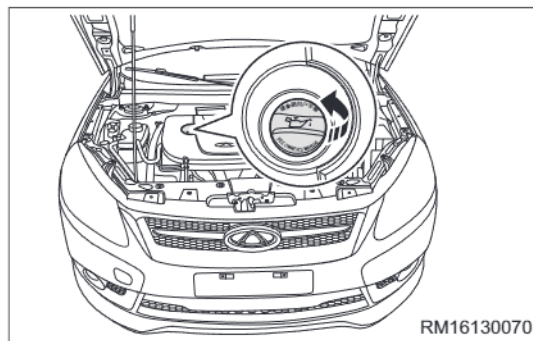
Engine Oil Replacement

Engine Oil Draining

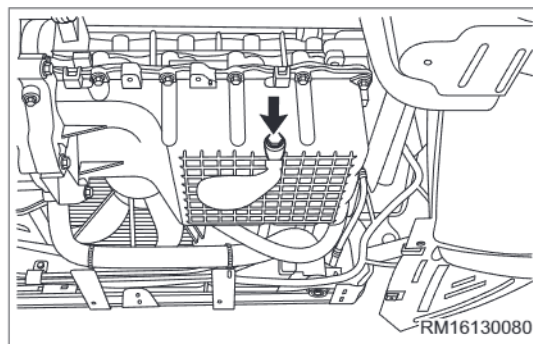
⚠ WARNING

- 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, 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. Open the oil filler cap.
 - a. Rotate the oil filler cap counterclockwise to open it.



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



⚠ WARNING

- 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.

**ENVIRONMENTAL PROTECTION**

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

- Wipe off the drain plug and tighten it.
(Tightening torque: $25 \pm 3 \text{ N}\cdot\text{m}$)

**CAUTION**

- Before installing drain plug, replace the drain plug washer with a new one.

Engine Oil Adding

Only use engine oil that meets Chery specifications.

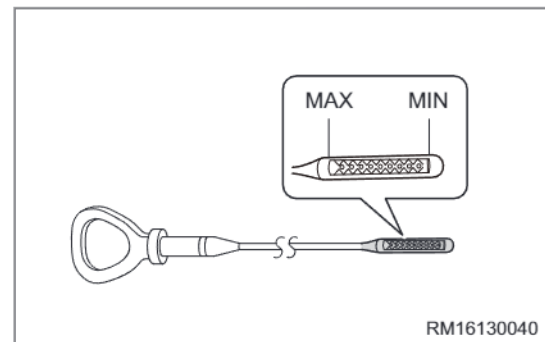
Engine Type	SQRE4G16
Oil Capacity (L)	4 ± 0.5
Oil Specifications	Summer: SAE 10W-40 (SM grade or higher) Winter: SAE 5W-40 (SM grade or higher)

**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 the engine when adding engine oil.

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



- 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.
- Check the vehicle for leakage after replacing oil.



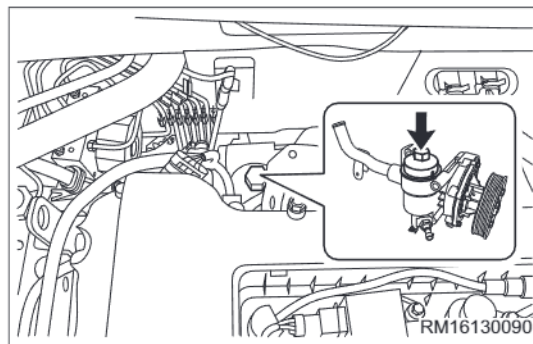
Oil Filter Element

Removal

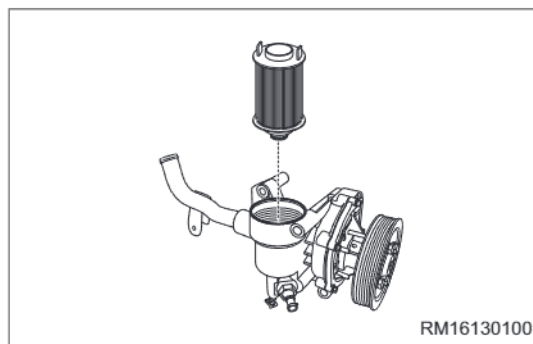
WARNING

- 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, 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 ([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 the oil filter element from oil filter module.



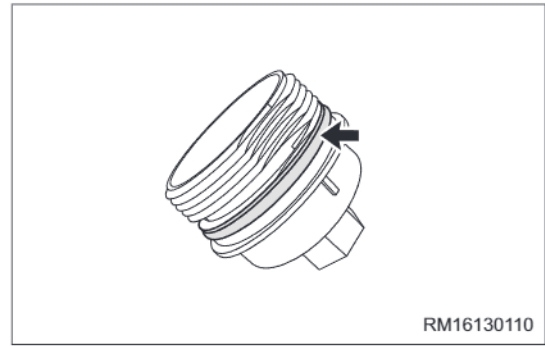
CAUTION

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

ENVIRONMENTAL PROTECTION

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

5. Remove the oil filter element O-ring 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. If there is damage, replace the cap.
- Check and clean the installation surface between oil filter element cap and oil filter module.
- Apply a layer of clean engine oil to the oil filter element O-ring.
- Slightly rotate oil filter element cap in place, and tighten it until the O-ring contacts with oil filter module.

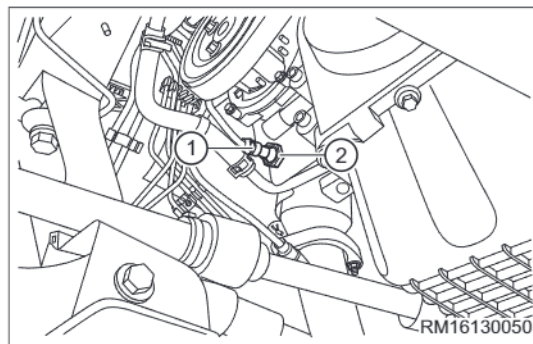
Oil Pressure Switch

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, 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 lower protector assembly ([See page 49-22](#)).
4. Remove the oil pressure switch.
 - a. Disconnect the oil pressure switch connector (1).
 - b. Remove the oil pressure switch (2).
(Tightening torque: $20 \pm 2 \text{ N}\cdot\text{m}$)



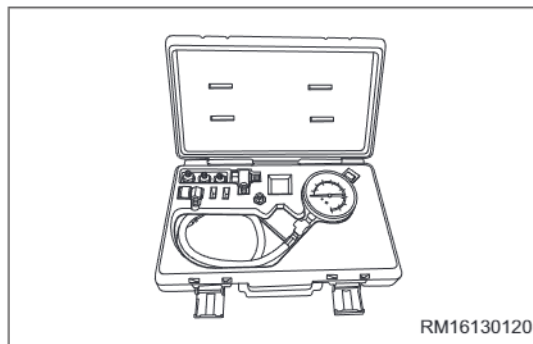
13

Inspection

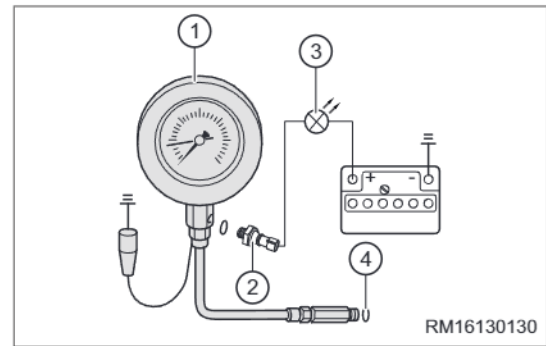
CAUTION

- 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 and cooling fan has stopped operating.

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

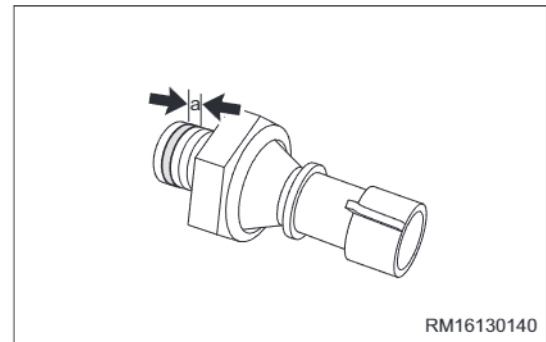


2. Install the oil pressure tester into the threaded hole (4) of oil pressure switch as shown in the illustration.
3. Install the oil pressure switch (2) onto the tester (1) and connect the oil pressure switch connector.
4. Connect the oil pressure switch to the body.
5. Start engine and oil pressure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



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

Oil Filter Module

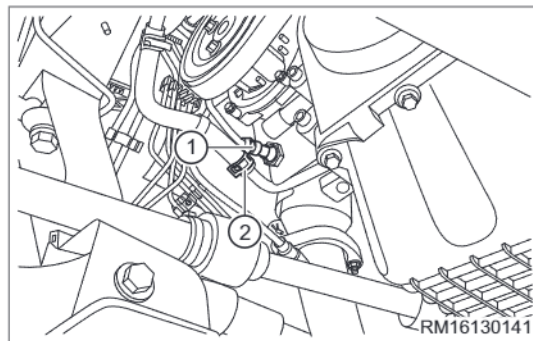
Removal

WARNING

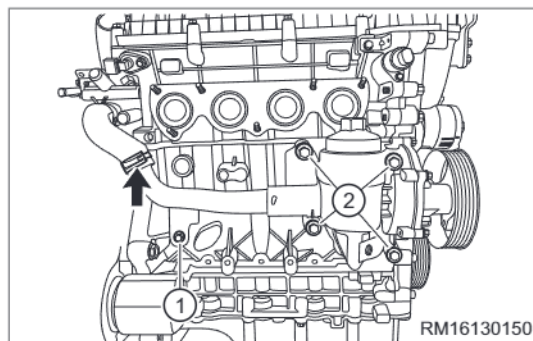
- DO NOT remove oil filter module until engine cools down.
- There will be residual coolant in engine, if your skin contacts coolant directly, clean it with water immediately. If it is serious, please go to hospital.
- Prolonged and repeated contact with engine oil will be harmful to your skin. If engine oil spills on your skin, wash it off immediately with water. In addition, 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 lower protector assembly (See page 49-22).
4. Move away the accessory drive belt (See page 07-21).
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 the elastic clamp (2) and disconnect the connection between expansion tank outlet hose and cooling pipe assembly I.



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



9. Remove the water pump and cooling pipe assembly I from oil filter module.

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.

Oil Pan

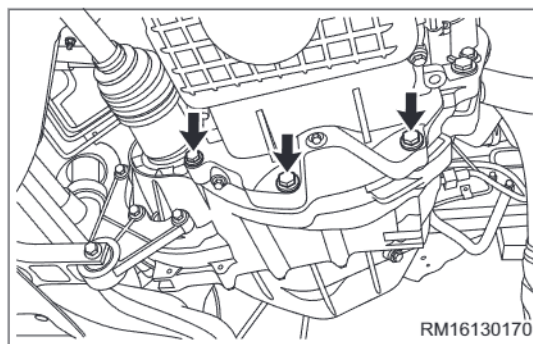
Removal

⚠ 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, 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 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 31-75).
4. Remove the engine lower protector assembly (See page 49-22).
5. Drain the engine oil (See page 13-12).
6. Remove the compressor assembly (See page 31-114).
7. Remove the oil pan.

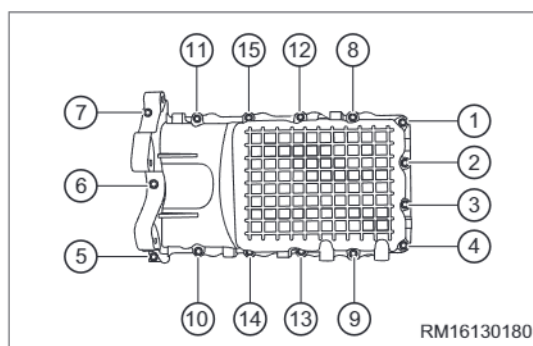
- a. Remove 3 coupling bolts (arrow) between oil pan and transmission case, and remove the plate between oil pan and transmission.
(Tightening torque: $50 \pm 5 \text{ N}\cdot\text{m}$)



HINT:

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

- b. Remove 15 coupling bolts from oil pan in the order shown in the illustration.
(Tightening torque: $20 + 5 \text{ N}\cdot\text{m}$)



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

HINT:

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.

CAUTION

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

8. Remove the residual seal gum on oil pan and engine frame with oil pan remover and scraper.

CAUTION

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

Installation

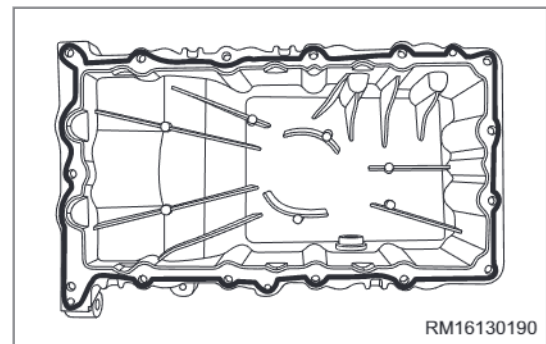
CAUTION

- 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.

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

Recommended seal gum: Loctite 5910

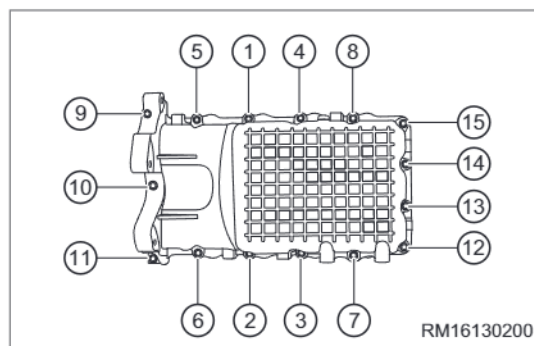


RM16130190

CAUTION

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

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



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

CAUTION

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

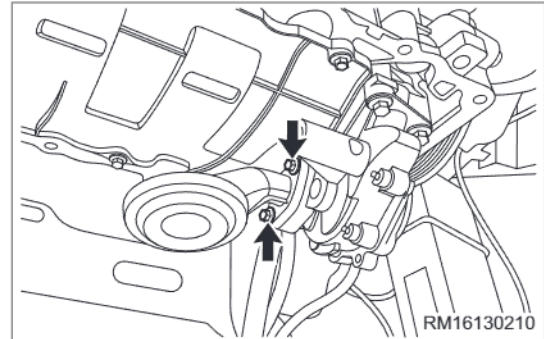
Oil Strainer

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, 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 ([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 the oil strainer.
(Tightening torque: $8 + 3 \text{ N}\cdot\text{m}$)



- b. Remove the 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.

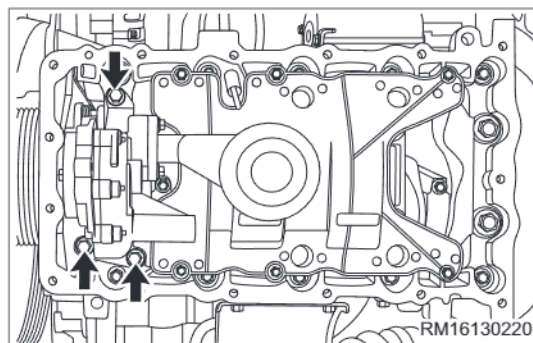
Oil Pump Assembly

Removal

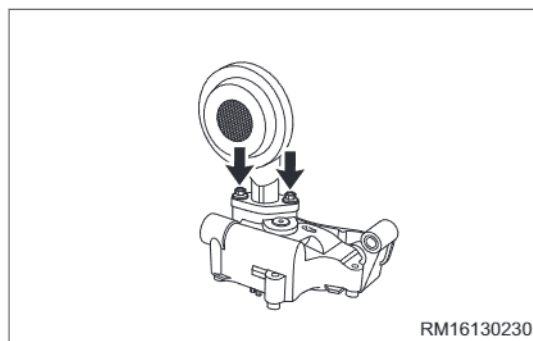
WARNING

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

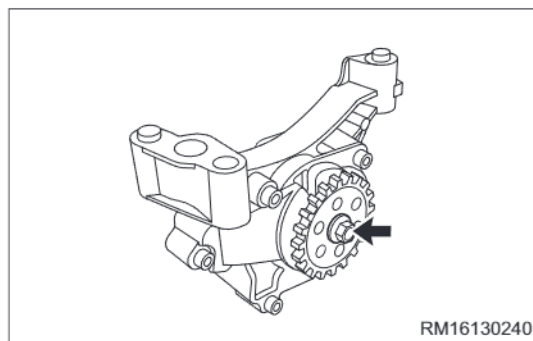
1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Drain the engine oil (See page 13-12).
4. Remove the oil pan (See page 13-20).
5. Remove the oil pump with oil strainer assembly.
 - a. Remove 3 fixing bolts (arrow) from oil pump assembly.
(Tightening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



- b. Move away the movable rail of oil pump chain and remove the oil pump with oil strainer assembly.
6. Remove 2 fixing bolts (arrow) from oil strainer, and then remove the oil strainer from oil pump.
(Tightening torque: $8 + 3 \text{ N}\cdot\text{m}$)



7. Remove the fixing bolt (arrow) from oil pump sprocket, and then remove the oil pump sprocket from oil pump.
(Tightening torque: $20 + 5 \text{ N}\cdot\text{m}$)



**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.

