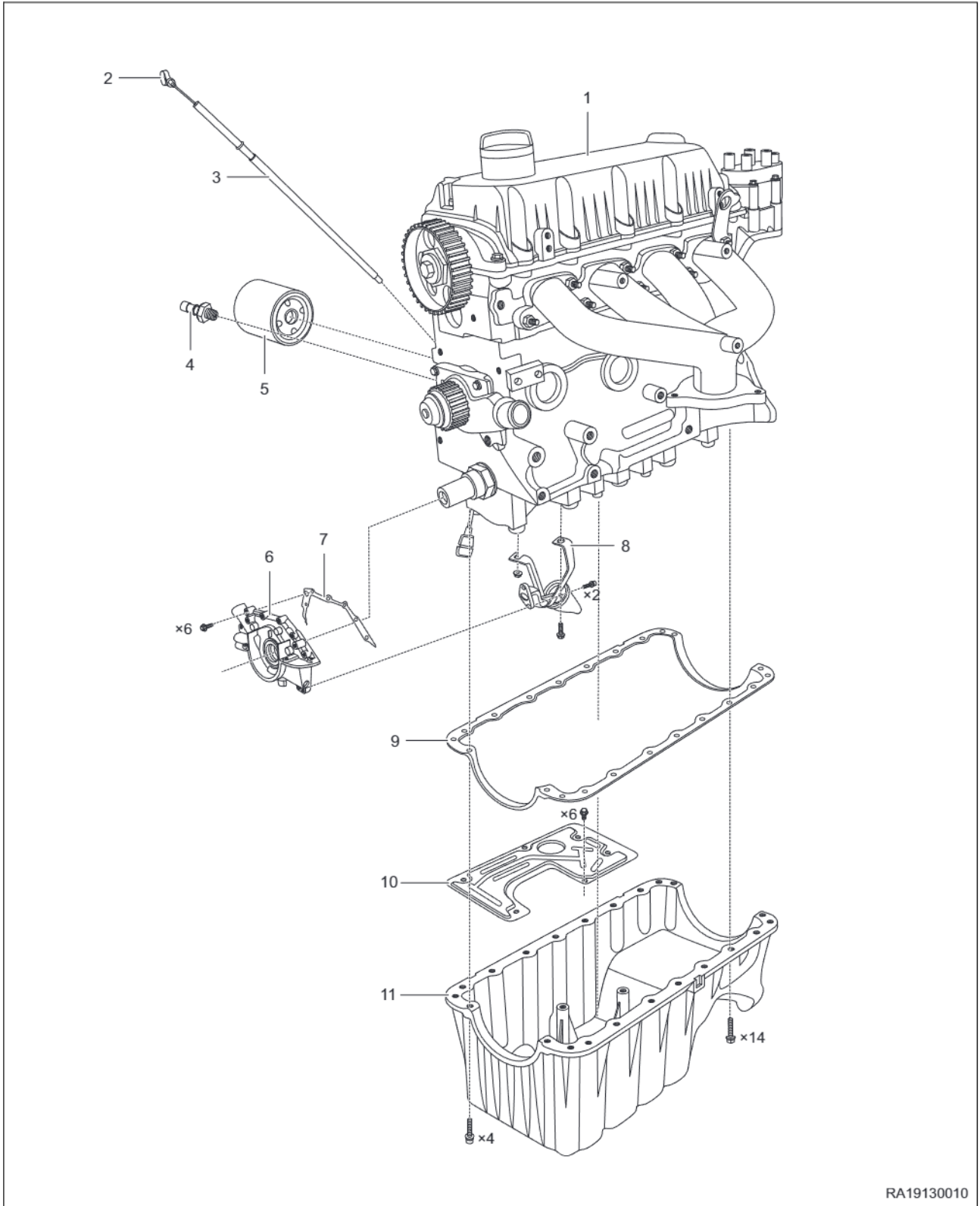

SQR477F LUBRICATION SYSTEM

GENERAL INFORMATION	13-3	Oil Filter	13-13
Description	13-3	Removal	13-13
Specifications	13-5	Installation	13-14
Tools	13-6	Oil Pressure Switch	13-15
Lubrication System Flowchart	13-7	Removal	13-15
DIAGNOSIS & TESTING	13-8	Installation	13-16
Problem Symptoms Table	13-8	Oil Pan	13-17
Engine Oil Level Inspection	13-9	Removal	13-17
Oil Pressure Inspection	13-10	Installation	13-18
ON-VEHICLE SERVICE	13-11	Oil Strainer	13-20
Engine Oil Replacement	13-11	Removal	13-20
Engine Oil Draining	13-11	Installation	13-20
Engine Oil Adding	13-12	Oil Pump Assembly	13-21
		Removal	13-21
		Installation	13-22

GENERAL INFORMATION

Description



1 - Engine Assembly	2 - Oil Dipstick
3 - Oil Dipstick Tube	4 - Oil Pressure Switch
5 - Oil Filter	6 - Oil Pump Assembly
7 - Oil Pump Assembly Gasket	8 - Oil Strainer
9 - Oil Pan Gasket	10 - Oil Baffle Plate
11 - Oil Pan	

The function of the lubrication system is that the crankshaft, when the engine is operating, drives the oil pump assembly to suck oil from the oil pan. The oil sucked out is filtered by the oil filter, then it flows to the friction surfaces of all drive parts through the oil passage and forms oil films between the friction surfaces to realize liquid friction, and finally returns to the oil pan, thus reducing friction resistance of drive parts, power consumption and wear of part and increasing the 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 (kPa)
Idling Speed (650 ± 50 r/min, oil temperature 90°C)	Above 1.5
High Speed (4000 ± 50 r/min, oil temperature 100°C)	Above 3.5

Oil Specifications

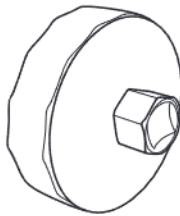
Engine Type	SQR477F
Oil Capacity (L)	3.9 ± 0.5
Oil Specifications	Summer: SAE 10W-40 (SL or higher) Winter: SAE 5W-40 (SL or higher)

Torque Specifications

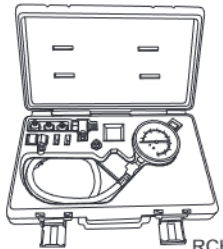
Description	Torque (N·m)
Drain Plug	35 ± 3
Oil Filter	25 ± 3
Coupling Bolt Between Oil Pan and Transmission Housing	45 ± 5
Fixing Bolt of Baffle Plate Between Oil Pan and Transmission	45 ± 5
Oil Pressure Switch	20 ± 2
Oil Pan Fixing Bolt	11 ± 1
Oil Pan Baffle Plate Fixing Bolt	$8 + 3$
Oil Strainer Bracket Fixing Bolt	17 - 23
Oil Strainer Bracket Fixing Nut	17 - 23
Coupling Bolt Between Oil Strainer and Oil Pump Assembly	17 - 23
Oil Pump Assembly Fixing Bolt	8 - 11

Tools

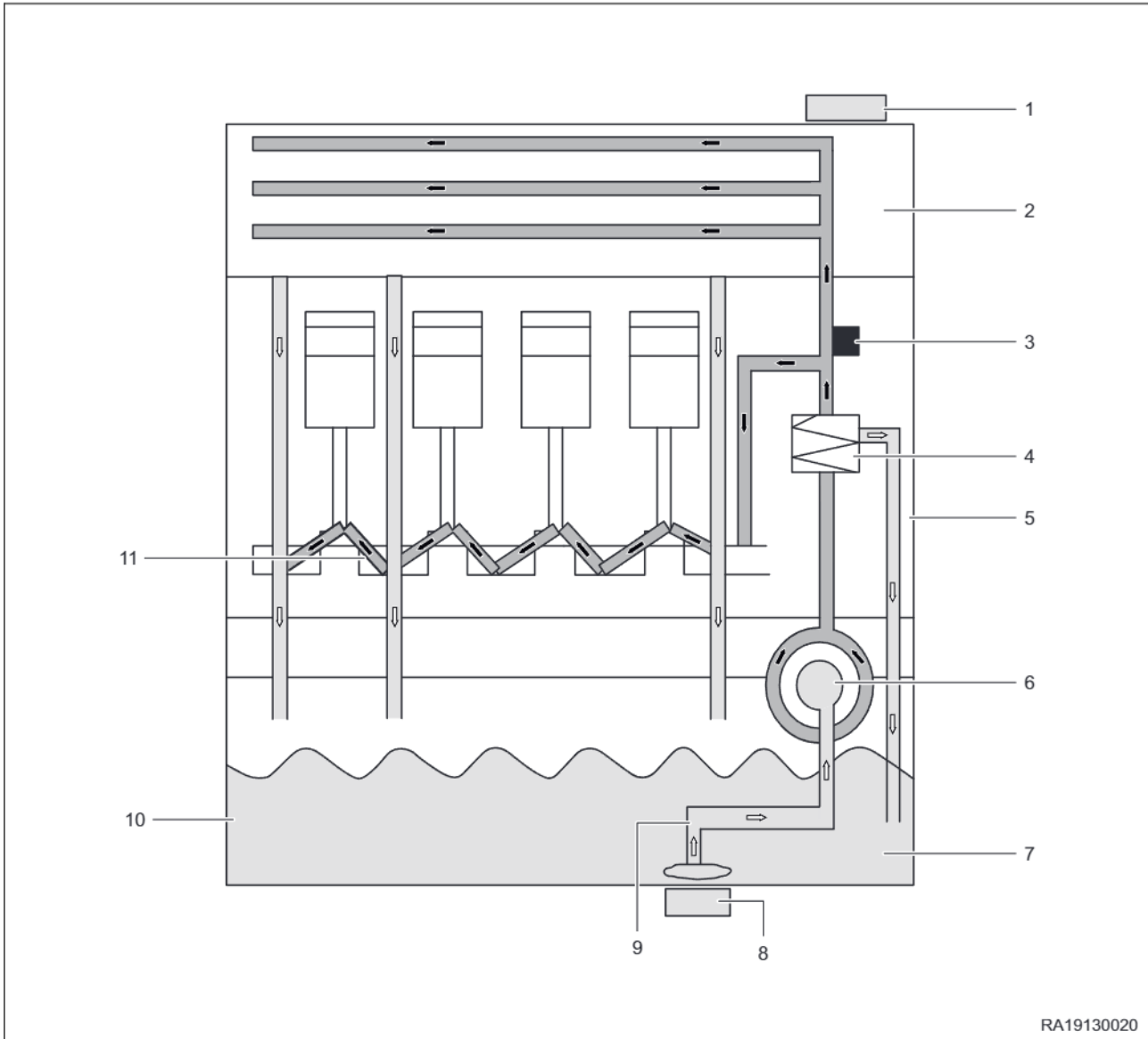
Special Tools

Oil Pan Remover and Scraper	 RCH0000056
Oil Filter Remover	 RCH0000054

General Tool

Oil Pressure Tester	 RCH0000006
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Lubrication System Flowchart



13

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

Description

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

DIAGNOSIS & TESTING

Problem Symptoms Table

HINT:

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

Symptom	Suspected Area	See page
Low pressure in lubrication system	Oil pan (dirty, leaked)	13-17
	Oil strainer (mesh dirty, blocked)	13-20
	Oil pump assembly	13-21
	Line (blocked)	-
High oil consumption	Engine oil (excessive oil filling capacity)	13-11
	Oil filter	13-13
	Each engine seal surface leakage	-
	Engine oil leakage	-
Oil pressure warning light comes on	Engine oil (insufficient oil, low oil viscosity)	13-11
	Oil filter (blocked)	13-13
	Leakage in lubrication system	-
	Oil pressure switch	13-15
	Instrument cluster (oil pressure warning light)	36-34
	Cylinder block (cracks occur in water jacket, resulting in coolant leaking into the oil pan, which will cause oil dilution)	07-67
	Line (blocked)	-
After engine cranked, the engine produces clunk sound	Engine oil (high oil viscosity, excessive oil filling capacity)	13-11
	Cylinder block (oil passage blocked)	07-67

Engine Oil Level Inspection

HINT:

Check the oil level indicated by the oil dipstick with the engine at operating temperature and stopped.

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

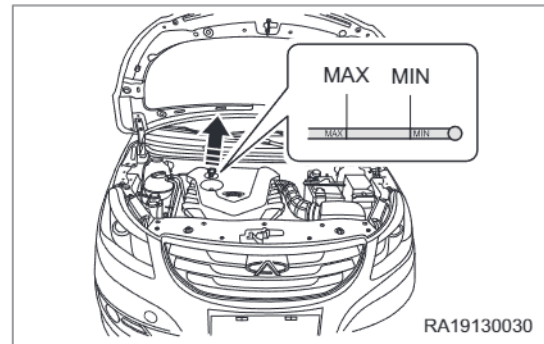
CAUTION

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

3. Reinsert the oil dipstick, check if the oil level is proper.
4. Pull out the oil dipstick again, check if the oil level is proper.

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

- a. If the oil level is at or above the "MAX" mark, drain the excessive engine oil.
- b. If the oil level is between "MIN" mark and "MAX" mark, it shows that the oil level is proper.
- c. If the oil level is below the "MAX" mark, it is necessary to add engine oil.



CAUTION

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

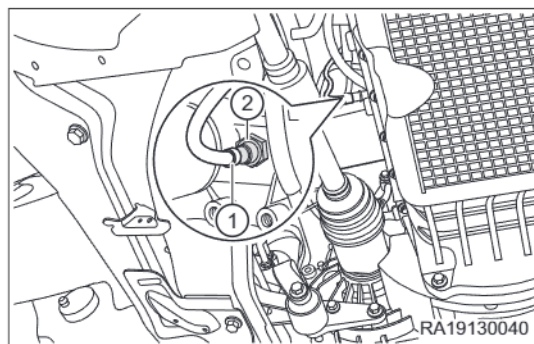
Oil Pressure Inspection

Preconditions

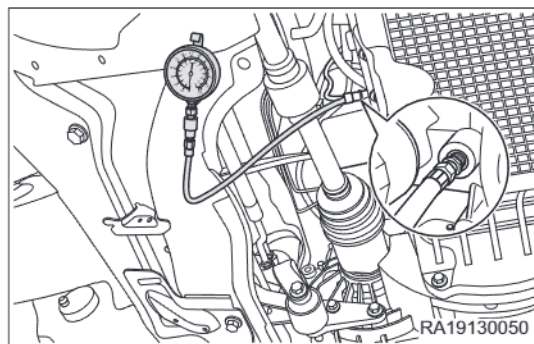
1. The engine oil level is normal.
2. The oil filter is used within 5000 km.
3. The engine reaches the normal operating temperature.

Inspection

1. Disconnect the oil pressure switch connector (1) and remove the oil pressure switch (2).
(Tightening torque: $20 \pm 2 \text{ N}\cdot\text{m}$)



2. Screw the oil pressure tester into the thread 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 the lubrication system pressure is low, clean the oil pan and oil strainer mesh, and then test again. If the lubrication system pressure is still low, it shows there is a malfunction in the oil pump assembly and the oil pump assembly must be replaced.

Oil pressure at idling speed ($650 \pm 50 \text{ r/min}$): higher than 1.5 bar.

Oil pressure at high speed ($4000 \pm 50 \text{ r/min}$): higher than 3.5 bar.

4. Install the oil pressure switch.

HINT:

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

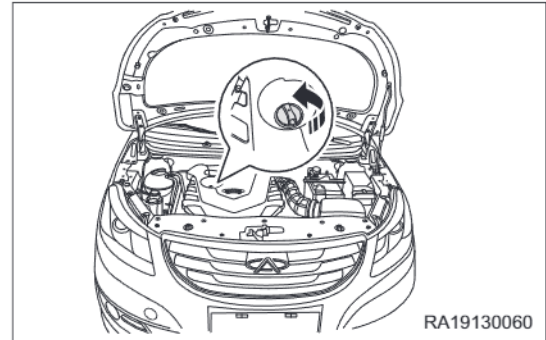
5. Connect the oil pressure switch connector and check the engine oil for leakage.

ON-VEHICLE SERVICE

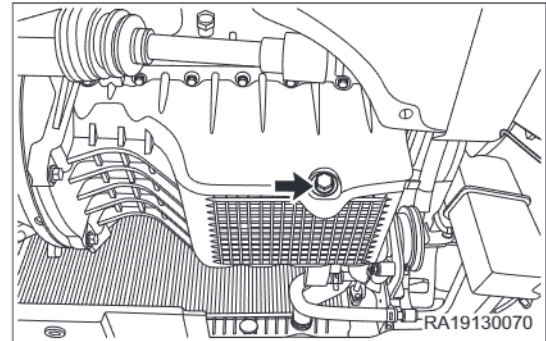
Engine Oil Replacement

Engine Oil Draining

1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Open the oil filler cap.



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



13

WARNING

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

ENVIRONMENTAL PROTECTION

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

5. Wipe off the drain plug and tighten it.
(Tightening torque: $35 \pm 3 \text{ N}\cdot\text{m}$)

Engine Oil Adding

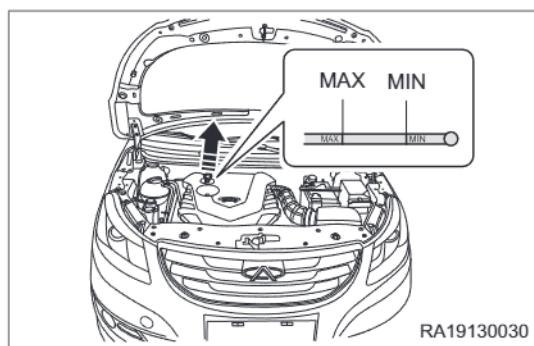
Only use engine oil that meets Chery specifications

Engine Type	SQR477F
Oil Capacity (L)	3.9 ± 0.5
Oil Specifications	Summer: SAE 10W-40 (SL or higher) Winter: SAE 5W-40 (SL 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 the engine oil.

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



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

Oil Filter

Removal

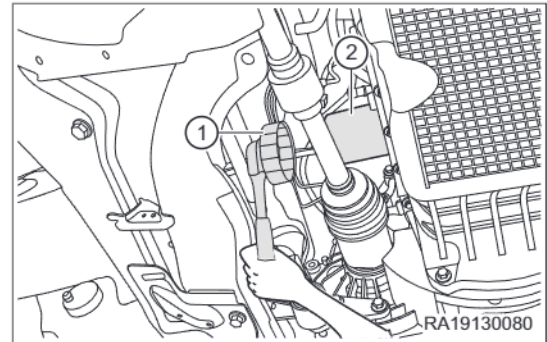
WARNING

- DO NOT remove the oil filter until the engine cools down.
- Prolonged and repeated contact with engine oil will be harmful to your skin. If the 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

- When repairing the oil filter, use the special oil filter installer to prevent the oil filter from deforming.

1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Drain the engine oil ([See page 13-11](#)).
4. Remove the oil filter.
 - a. Using the oil filter remover (1), remove the oil filter (2).
(Tightening torque: $25 \pm 3 \text{ N}\cdot\text{m}$)



ENVIRONMENTAL PROTECTION

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

Installation

Installation is in the reverse order of removal.

CAUTION

- Check the oil filter bracket grommet for damages and cracks. If there are damages or cracks, replace the grommet.
- Check and clean the installation surface between oil filter and oil filter bracket.
- Apply a layer of clean engine oil to the new oil filter grommet.
- Slightly rotate the oil filter in place by hand, and tighten the oil filter until the grommet contacts with the oil filter bracket base.
- Using a special tool to tighten the oil filter.
(Tightening torque: $25 \pm 3 \text{ N}\cdot\text{m}$)

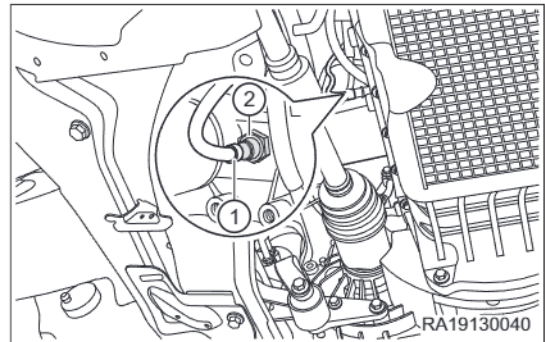
Oil Pressure Switch

Removal

WARNING

- DO NOT remove the oil pressure switch until the engine cools down.
- Prolonged and repeated contact with engine oil will be harmful to your skin. If the 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 the electrical equipment and 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: $20 \pm 2 \text{ N}\cdot\text{m}$)



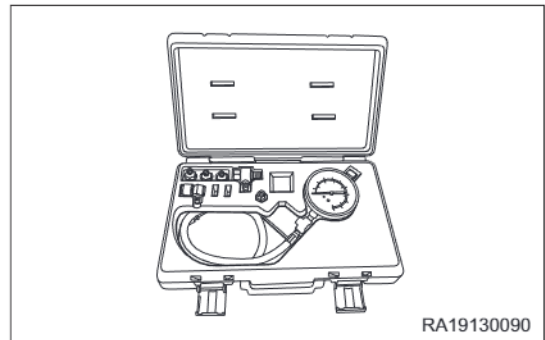
13

Inspection

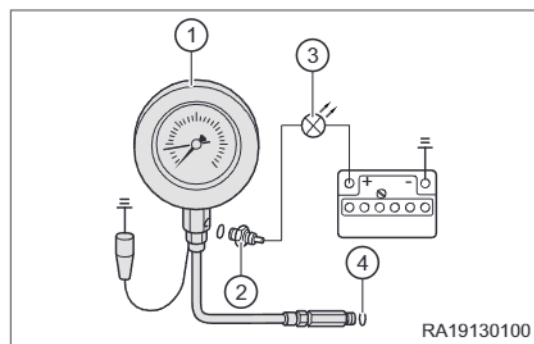
CAUTION

- Before inspecting the oil pressure switch, please make sure that the oil level is proper and coolant temperature is up to above 90°C , and that the oil filter is used within 5000 km and electrical fan stops operating.

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

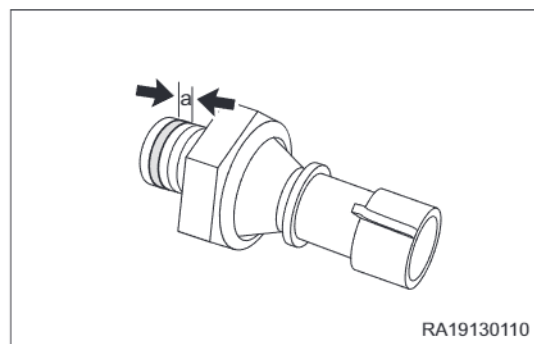


2. Install the oil pressure tester into the thread hole (4) of oil pressure switch as shown in the illustration.
3. Install the oil pressure switch (2) onto the tester (1) and connect the oil pressure switch connector.
4. Connect the oil pressure switch to the body.
5. Start the engine and the oil pressure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



Installation

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



Oil Pan

Removal

WARNING

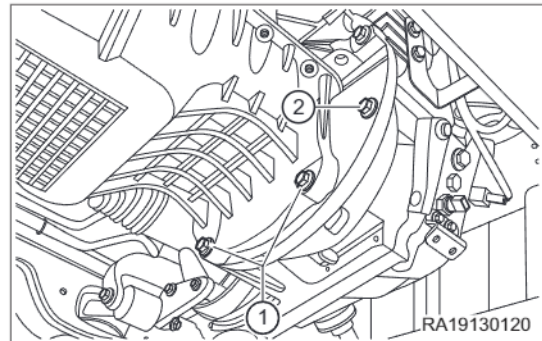
- DO NOT remove the oil pan until the engine cools down.
- Prolonged and repeated contact with engine oil will be harmful to your skin. If the engine oil spills on your skin, wash it off immediately with water. In addition, the used engine oil contains potentially harmful contaminants, which may cause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

1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the main catalytic converter assembly (See page 11-11).
4. Drain the engine oil (See page 13-11).

ENVIRONMENTAL PROTECTION

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

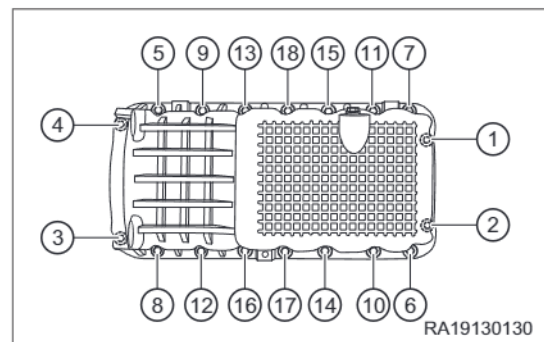
5. Remove the baffle plate between oil pan and transmission.
 - a. Remove 2 coupling bolts (1) between oil pan and transmission housing.
(Tightening torque: 45 ± 5 N·m)
 - b. Remove the fixing bolt (2) of baffle plate between oil pan and transmission.
(Tightening torque: 45 ± 5 N·m)



13

- c. Remove the baffle plate between oil pan and transmission.
6. Remove the oil pan.

- a. Pre-loosen the oil pan fixing bolts first, and then remove them in the order shown in the illustration.
(Tightening torque: 11 ± 1 N·m)

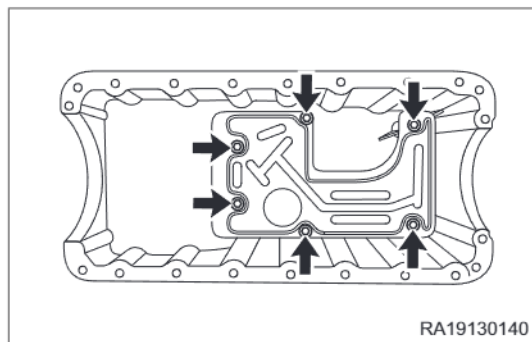


- b. Pry the oil pan at specific prying locations on the oil pan with the oil pan remover and scraper and remove it.

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.

- Remove the oil pan gasket.
- Remove the fixing bolts (arrow) from the oil pan baffle plate, and remove the oil pan baffle plate.
(Tightening torque: $8 + 3 \text{ N}\cdot\text{m}$)

**Installation**

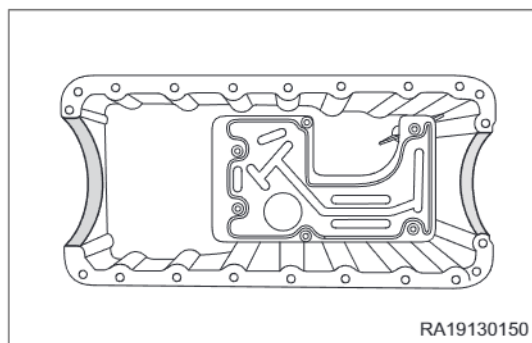
Installation is in the reverse order of removal.

CAUTION**13**

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

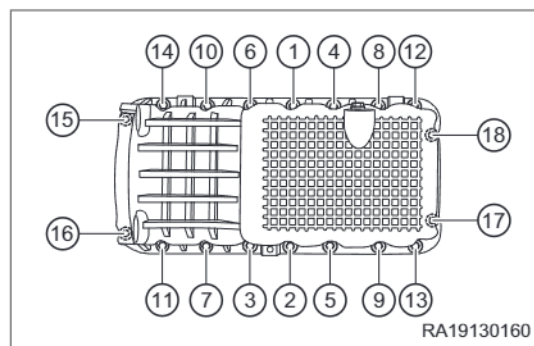
- Apply seal gum to the semicircular matching surfaces between oil pan gasket and oil pump, rear oil seal bracket and oil pan as shown in the illustration.

Recommended seal gum: Loctite 5910



- Replace the oil pan gasket with a new one.

3. Pre-tighten the oil pan fixing bolts until they are enough for press fit, and then tighten the oil pan fixing bolts in the order shown in the illustration.
(Tightening torque: $11 \pm 1 \text{ N}\cdot\text{m}$)



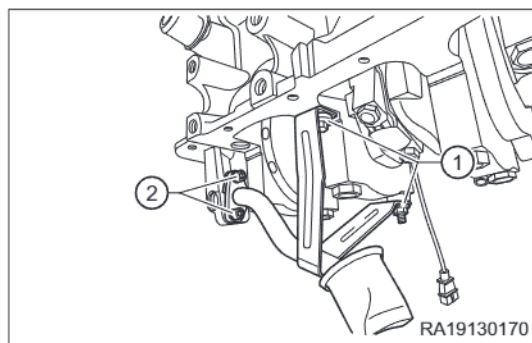
Oil Strainer

Removal

WARNING

- DO NOT remove the oil strainer until the engine cools down.
- Prolonged and repeated contact with engine oil will be harmful to your skin. If the 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 the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the oil pan ([See page 13-17](#)).
4. Remove the oil strainer.
 - a. Remove the fixing bolt and nut (1) from the oil strainer bracket.
(Tightening torque: 17 - 23 N·m)
 - b. Remove the coupling bolts (2) between oil strainer and oil pump assembly.
(Tightening torque: 17 - 23 N·m)



- c. Remove the oil strainer and its grommet.

Installation

Installation is in the reverse order of removal.

CAUTION

- Check the oil strainer grommet for damage and cracks. If there are damage or cracks, replace the grommet.

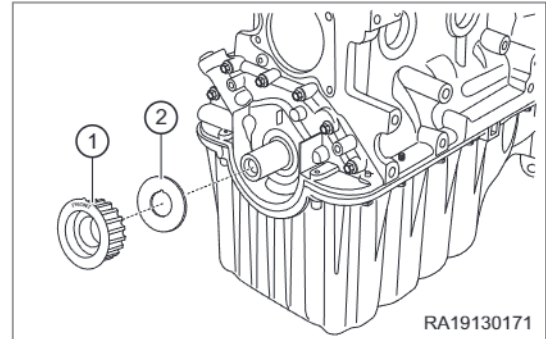
Oil Pump Assembly

Removal

WARNING

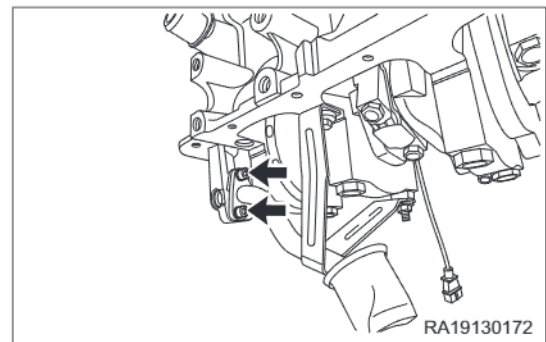
- DO NOT remove the oil pump assembly until the engine cools down.
- Prolonged and repeated contact with engine oil will be harmful to your skin. If the engine oil spills on your skin, wash it off immediately with water. In addition, the used engine oil contains potentially harmful contaminants, which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

1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Drain the engine oil ([See page 13-11](#)).
4. Remove the engine accessory drive belt ([See page 07-21](#)).
5. Remove the engine timing belt ([See page 07-28](#)).
6. Remove the crankshaft timing pulley (1) and crankshaft timing pulley washer (2) from the crankshaft.

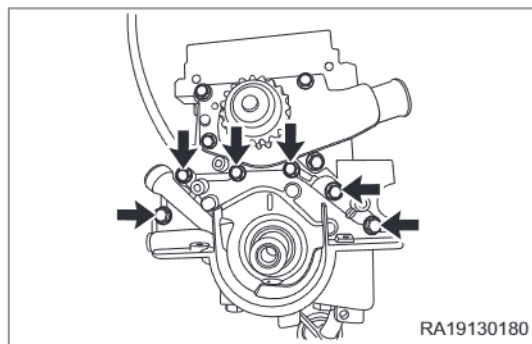


13

7. Remove the crankshaft front oil seal ([See page 07-33](#)).
8. Remove the main catalytic converter assembly ([See page 11-11](#)).
9. Remove the oil pan ([See page 13-17](#)).
10. Remove the oil pump assembly.
 - a. Remove the coupling bolts (2) between oil strainer and oil pump assembly.
(Tightening torque: 17 - 23 N·m)



- b. Remove 6 fixing bolts (arrow) from the oil pump assembly.
(Tightening torque: 8 - 11 N·m)



- c. Remove the oil pump assembly and its gasket.

ENVIRONMENTAL PROTECTION

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

Installation

Installation is in the reverse order of removal.

CAUTION

- When installing the crankshaft timing pulley, the side with "FRONT" should face forward.
- Rotate the oil pump until the oil in the oil passage flows out of the outlet.
- Replace the oil pump assembly gasket.
- Apply seal gum to the surface between oil pump assembly bottom and cylinder block before installing the oil pump assembly.
- Replace the oil strainer grommet before installing the oil strainer.
- Replace the oil pan gasket before installing the oil pan.

