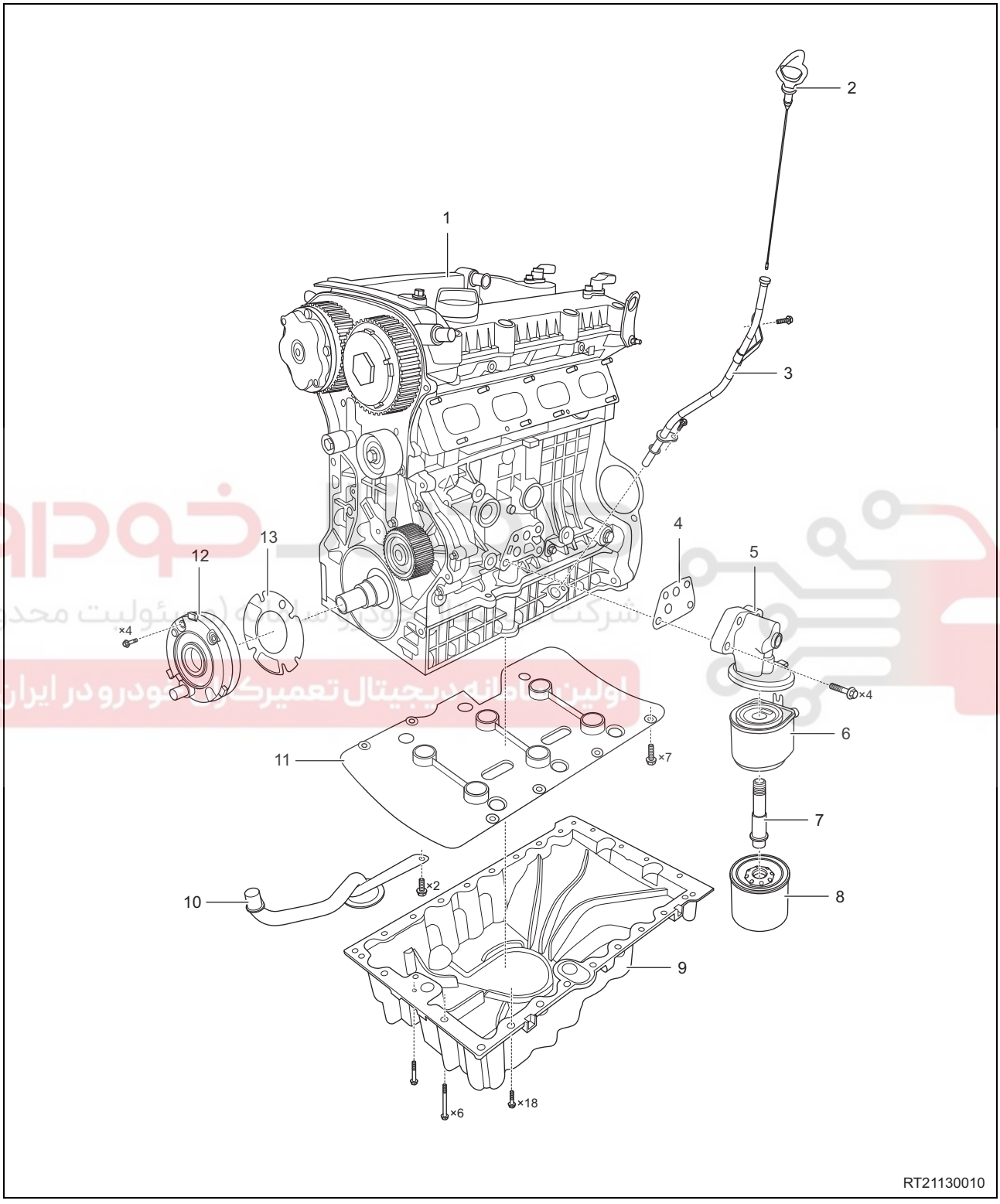
SQR484F LUBRICATION SYSTEM

GENERAL INFORMATION

Description



1 - Engine Assembly	2 - Oil Dipstick
3 - Oil Dipstick Tube	4 - Oil Cooler Bracket Shim
5 - Oil Cooler Bracket	6 - Oil Cooler Assembly
7 - Oil Filter Joint	8 - Oil Strainer Filter
9 - Oil Pan	10 - Oil Strainer
11 - Oil Baffle Plate	12 - Oil Pump Assembly
13 - Oil Pump Assembly Gasket	

The function of lubrication system is that crankshaft, when the engine is operating, drives oil pump to suck oil from oil pan. The sucked oil is filtered by oil filter, then it flows to the friction surfaces of all drive parts through oil passage and forms oil films between the friction surfaces to realize liquid friction, and finally returns to oil pan, thus reducing the 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 (bar)
Idling Speed (750 ± 50 r/min)	Above 1.5 (oil temperature 90°C)
High Idling Speed (2000 r/min)	Above 3.6 (oil temperature 90°C)
High Speed (4000 r/min)	Above 4.7 (oil temperature 90°C)

Oil Specifications

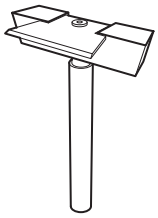
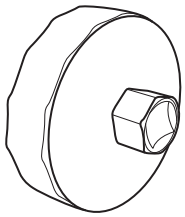
Engine Type	SQR484F
Oil Capacity (L)	4 ± 0.5
Oil Specifications	Summer: SAE 10W - 40 (SM grade or higher) Winter: SAE 5W - 40 (SM grade or higher)

Torque Specifications

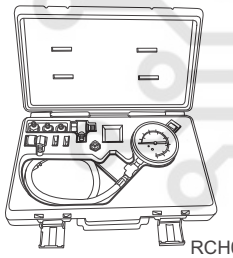
Description	Torque (N·m)
Drain Plug	35 ± 3
Oil Filter	25 ± 3
Coupling Bolt Between Oil Pan and Transmission Case	45 ± 5
Fixing Bolt of Baffle Plate Between Oil Pan and Transmission Case	45 ± 5
Oil Pressure Switch	20 ± 2
Oil Pan Fixing Bolt	11 ± 1
Oil Pan Baffle Plate Fixing Bolt	8 + 3
Oil Strainer Bracket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

Tools

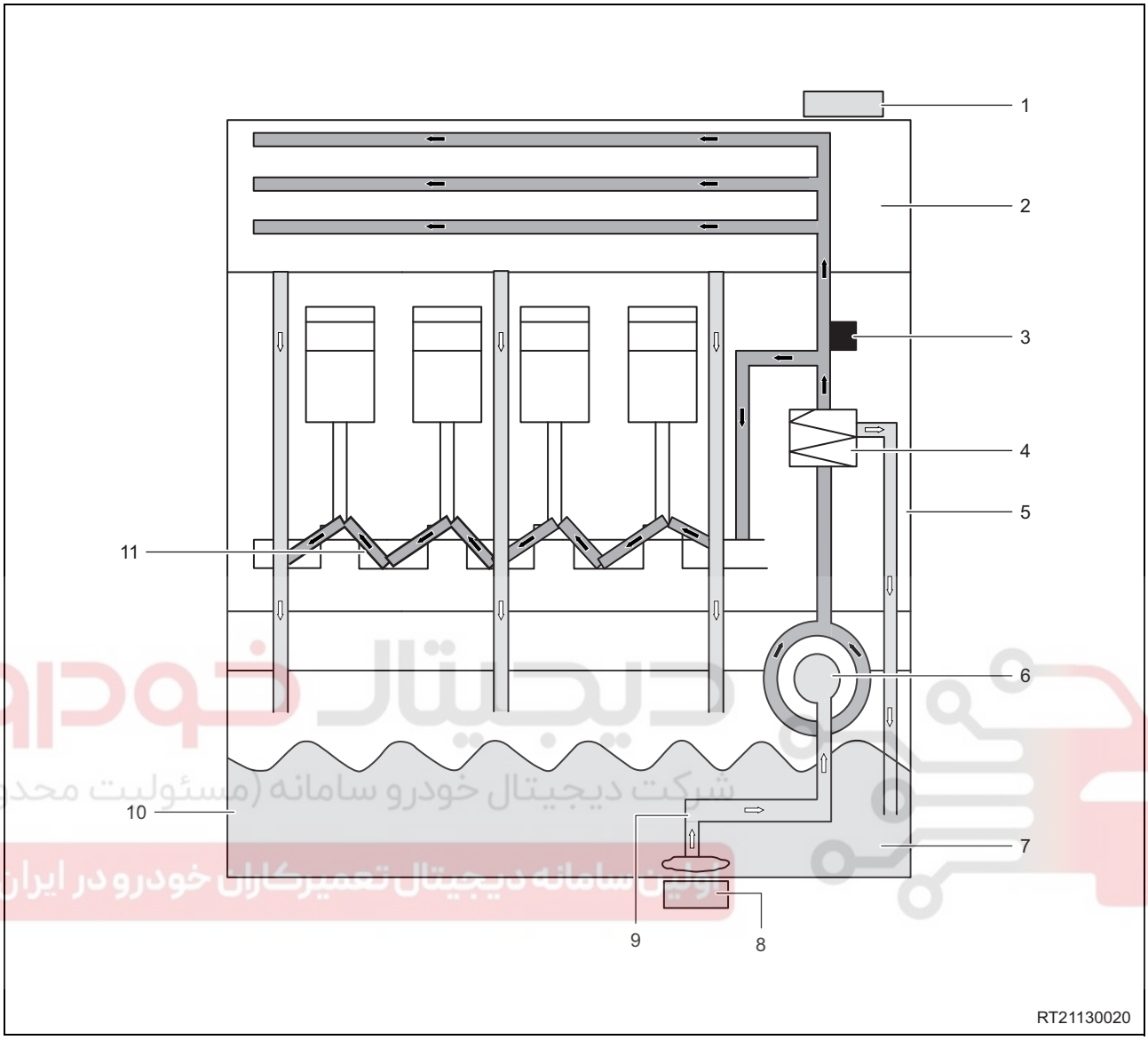
Special Tools

Oil Pan Remover and Scraper	 RCH0000056
Oil Filter Remover	 RCH0000054

General Tool

Oil Pressure Tester	 RCH0000006

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 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

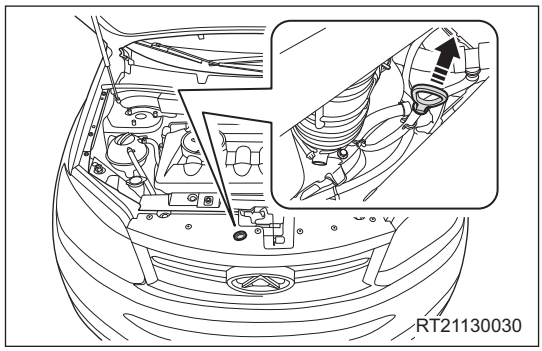
HINT:
Use the table below to help determine the cause of the problem symptoms. Check each suspected area in sequence. Repair or replace the faulty components, or adjust as necessary.

Symptom	Suspected Area	See page
Low pressure in lubrication system	Oil pan (dirty, leaked)	20-20
	Oil strainer (mesh dirty, blocked)	20-23
	Oil pump	20-24
	Line (blocked)	-
High oil consumption	Engine oil (excessive oil filling capacity)	20-9
	Oil filter (leaked)	20-13
	Crankshaft front oil seal (damaged)	07-39
	Crankshaft rear oil seal (damaged)	07-44
	Oil pressure switch	20-16
	Oil drain plug (leaked)	-
	Oil pan (leaked)	20-20
	Each engine seal surface leakage	-
	Engine oil leakage	-
Oil pressure warning light comes on	Engine oil (insufficient oil, low oil viscosity)	-
	Oil filter (blocked)	20-13
	Oil strainer (blocked)	20-23
	Crankshaft front oil seal (damaged)	07-39
	Crankshaft rear oil seal (damaged)	07-44
	Oil pressure switch (damaged)	20-16
	Instrument cluster (oil pressure warning light)	51-48
	Cylinder block (cracks occur in water jacket, resulting in coolant leaking into the oil pan, which will cause oil dilution)	07-78
	Line (blocked)	-
After cranking , clunking sound from engine is heard	Engine oil (high oil viscosity, excessive oil filling capacity)	-
	Cylinder block (oil passage blocked)	07-78

Engine Oil Level Inspection

HINT:
Check the oil level indicated by oil dipstick, when engine stops after it reaches operating temperature.

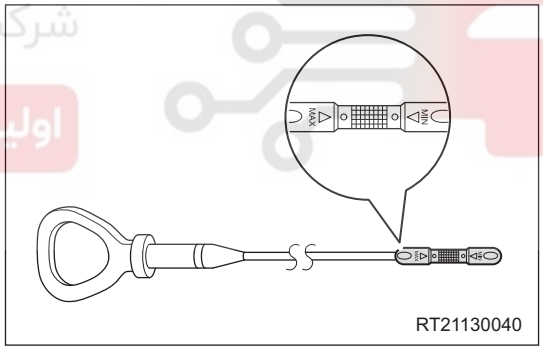
1. Park vehicle on level ground, stop the engine after warming up and wait for 5 minutes.
2. Open the engine hood and pull out the oil dipstick, and wipe it clean with a piece of clean cloth.



CAUTION

- Please place 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 oil level is proper.
4. Pull out the oil dipstick again, check if oil level is proper.
   If engine oil level is 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 the oil level is proper.
   c. If oil level is below the "MIN" 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

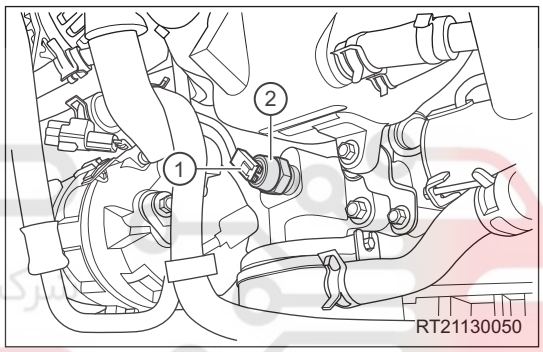
⚠ WARNING

- 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.

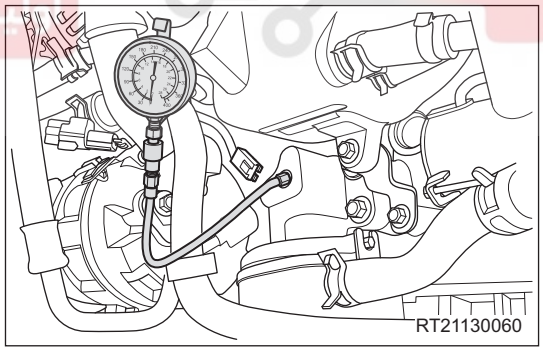
1. Engine oil level is normal.
2. Oil filter is used within 5000 km.
3. Engine reaches the normal operating temperature.

Inspection

1. Remove the engine lower right protector assembly (See page 62-29).
2. Disconnect the oil pressure switch connector (1) and remove the oil pressure switch (2).
   (Tightening torque: 20 ± 2 N·m)



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



4. Start 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 idling speed (700 ± 50 r/min): higher than 1.5 bar.
   Oil pressure at high idling speed (2000 r/min): higher than 3.6 bar.
   Oil pressure at high speed (4000 r/min): higher than 4.7 bar.
5. Install the oil pressure switch.

   HINT:
   Apply a small amount of seal gum to the threads when installing the oil pressure switch.
6. Connect the oil pressure switch connector and check the engine oil for leakage.
7. Install the engine lower right protector assembly.

ON-VEHICLE SERVICE

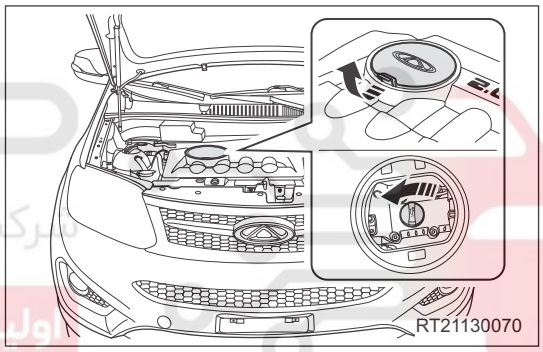
Engine Oil Replacement

Engine Oil Draining

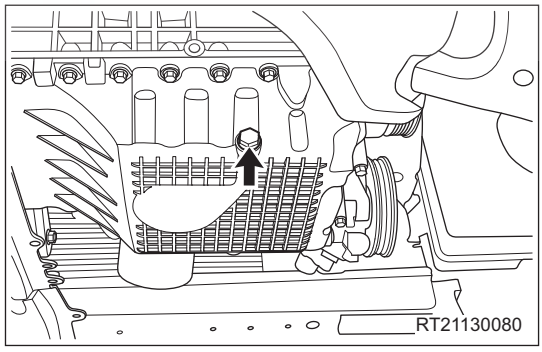
⚠ WARNING

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



4. 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 the thread tightly to prevent oil from overflowing in advance. Move away the hand quickly to prevent burn by the 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.

5. Wipe off the drain plug and tighten it.
   (Tightening torque: 35 ± 3 N·m)

Engine Oil Adding

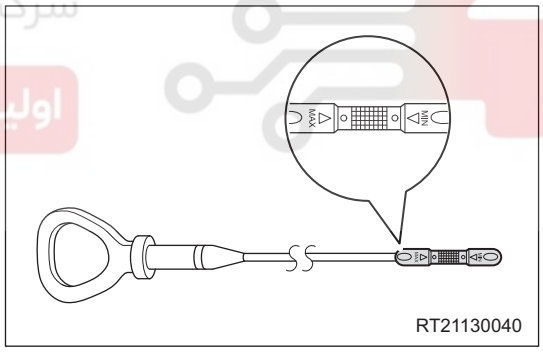
Only use engine oil that meets Chery specifications

Engine Type	SQR484F
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 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 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.
3. Check the vehicle for leakage after replacing oil.

Oil Filter

Removal

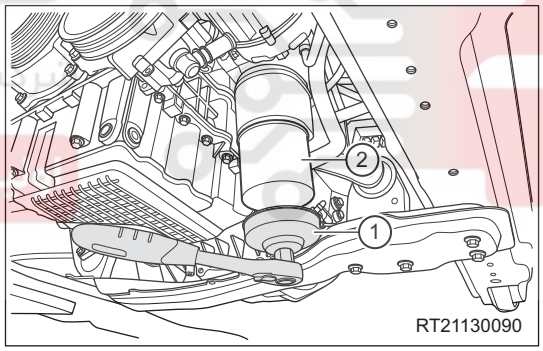
⚠ WARNING

- DO NOT remove oil filter 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

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

1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the engine lower right protector assembly (See page 62-29).
4. Drain the engine oil (See page 20-11).
5. Remove the oil filter.
   a. Using the oil filter remover (1), remove the oil filter (2). (Tightening torque: 25 ± 3 N·m)



ENVIRONMENTAL PROTECTION

- The removed oil filter 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

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

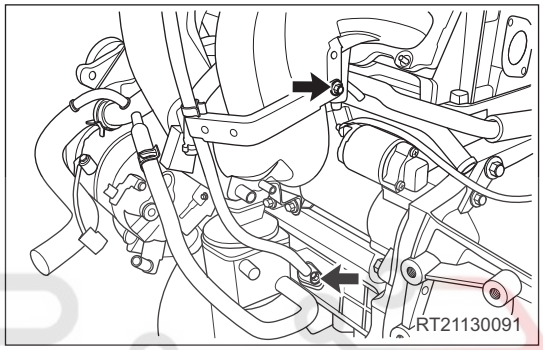
Oil Dipstick Tube

Removal

CAUTION

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover assembly (See page 14-9).
4. Remove the oil dipstick tube with oil dipstick assembly.
   a. Remove 2 oil dipstick tube fixing bolts (arrow).
   (Tightening torque: 8 ± 3 N·m)



   b. Remove the oil dipstick tube with oil dipstick assembly from the engine block frame.
   c. Separate the oil dipstick from the oil dipstick tube.

Installation

Installation is in the reverse order of removal.

CAUTION

- Check oil dipstick tube grommet when installing, if damaged, replace with a new one.
- Apply a coat of engine oil to oil dipstick tube grommet when installing.

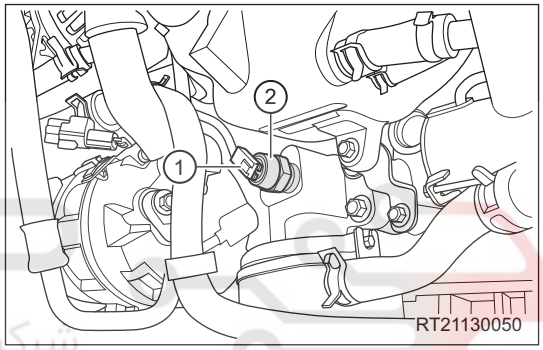
Oil Pressure Switch

⚠ 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.

Removal

1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the engine lower right protector assembly (See page 62-29).
4. Remove the oil pressure switch.
   a. Disconnect the oil pressure switch connector (1) and remove the oil pressure switch (2).
   (Tightening torque: 20 ± 2 N·m)

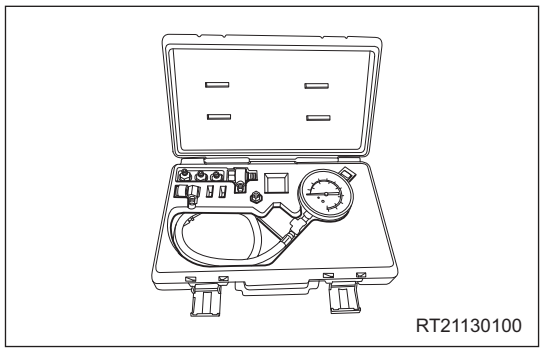


Inspection

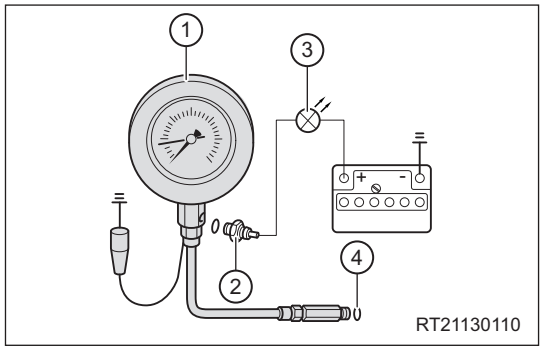
CAUTION

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

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



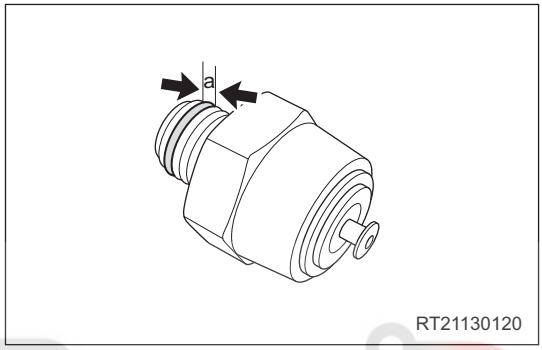
2. Install the oil pressure tester into the thread hole (4) of oil pressure switch as shown in the illustration.
3. Install the oil pressure switch (2) onto the tester (1) and connect the oil pressure switch connector.
4. Connect the oil pressure switch to the body.
5. Start engine and oil pressure warning 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 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



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

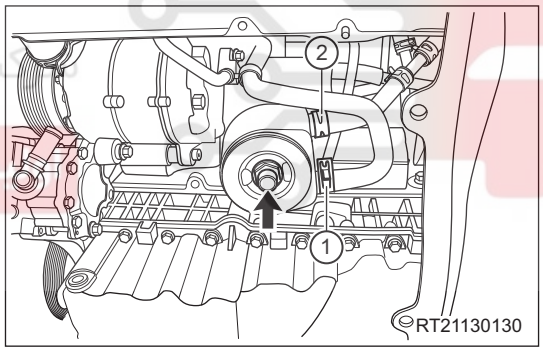
Oil Cooler Assembly

Removal

⚠ WARNING

- DO NOT disconnect oil cooler inlet hose and oil cooler outlet hose until engine is in low temperature. Otherwise, overheated engine coolant and steam with high-pressure may flow out and cause serious personal injury.
- If your body contacts coolant accidentally, clean it with water immediately. If it is serious, please go to hospital.
- DO NOT remove oil filter and oil cooler assembly 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.

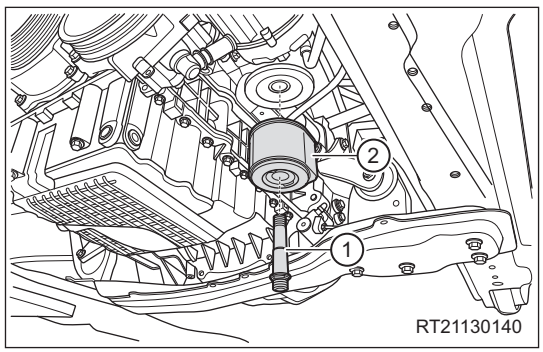
1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the engine lower right protector assembly (See page 62-29).
4. Drain the engine oil (See page 20-11).
5. Remove the oil filter (See page 20-13).
6. Remove the oil cooler assembly.
   a. Loosen the elastic clamp (1) and disconnect the connection between oil cooler outlet hose and oil cooler assembly.
   b. Loosen the elastic clamp (2) and disconnect the connection between oil cooler inlet hose and oil cooler assembly.
   c. Using an appropriate tool, loosen the oil filter joint (arrow).
   (Tightening torque: 50 ± 5 N·m)



CAUTION

- After disconnecting oil cooler outlet hose and oil cooler inlet hose, cover the hoses with wooden corks or equivalent to prevent coolant in hoses from flowing out.

   d. Remove the oil filter joint (1) and oil cooler assembly (2) in order.



Installation

Installation is in the reverse order of removal.

CAUTION

- Clean installation surface of oil cooler assembly.
- Replace fuel filter.
- Add engine oil to specified level.
- Check and add engine coolant.

Oil Pan

Removal

⚠ WARNING

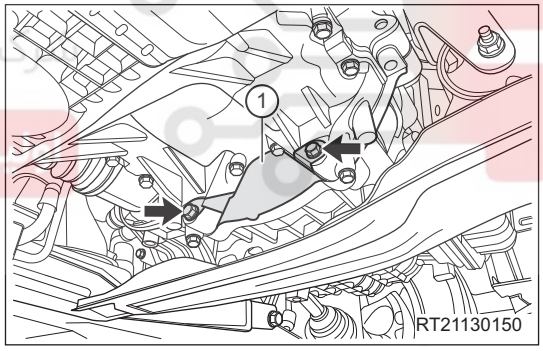
- DO NOT drain engine oil and remove oil pan until engine cools down.
- Prolonged and repeated contact with engine oil will be harmful to your skin. If engine oil spills on your skin, wash it off immediately with water. In addition, the used engine oil contains potentially harmful contaminants, which 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 the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the engine lower protector assembly (See page 62-29).
4. Drain the engine oil (See page 20-11).

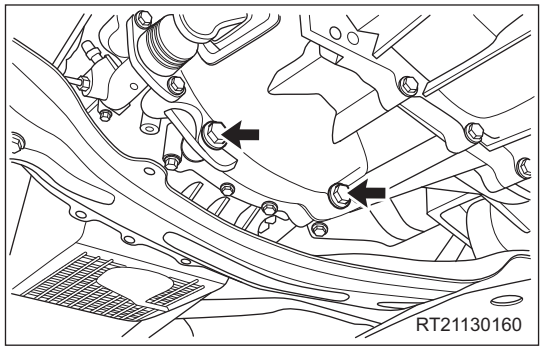
ENVIRONMENTAL PROTECTION

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

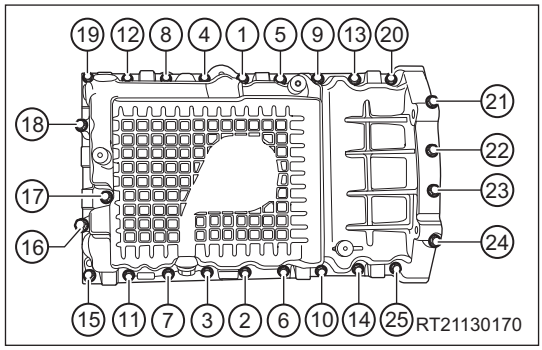
5. Remove the oil pan.
   a. Remove 2 baffle plate fixing bolts (arrow), and remove the baffle plate (1) (for CVT model).
   (Tightening torque: 50 ± 5 N·m)



   b. Remove 2 coupling bolts (arrow) between transmission assembly and oil pan (for MT model).
   (Tightening torque: 50 ± 5 N·m)



c. Loosen and remove the oil pan fixing bolts in the order shown in the illustration.
(Tightening torque: 15 + 3 N·m)



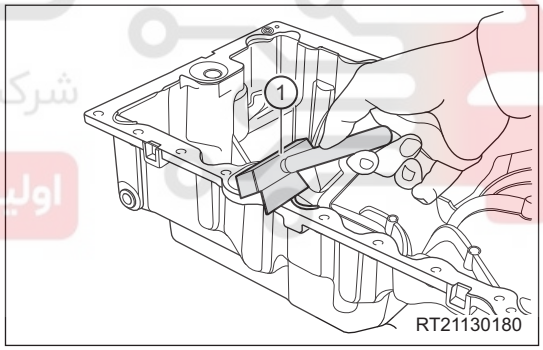
d. Pry off the oil pan at specific prying locations on the oil pan with oil pan remover and scraper and remove it.

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 oil pan during removal, to prevent personal injury from sudden dropping of oil pan.

6. Remove the residual seal gum on oil pan with oil pan remover and scraper (1).



CAUTION

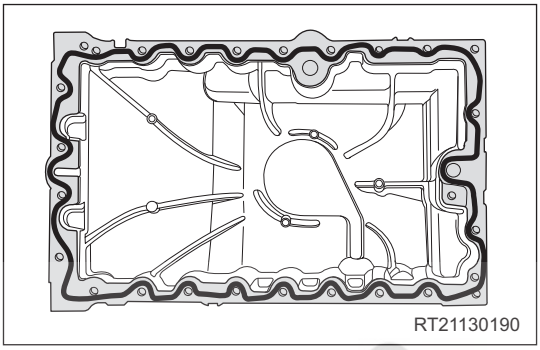
- After removing seal gum with oil pan scraper, clean the cylinder block installation surface, thread hole and oil pan with appropriate cleaner.

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 cylinder block and thread 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.

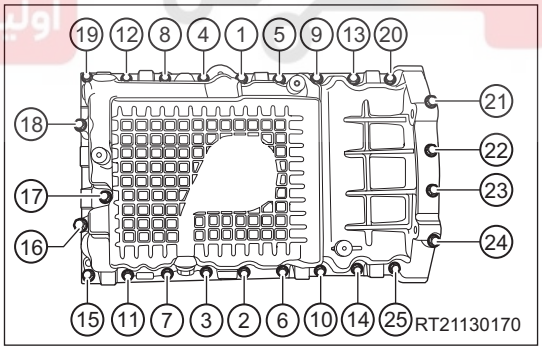
1. Uniformly apply seal gum to the oil pan installation surface as shown in the illustration.
   Recommended seal gum: Loctite 5910



CAUTION

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

2. Pre-tighten the oil pan fixing bolts until it is enough for press fit, and then tighten the oil pan fixing bolts in the order shown in the illustration.
   (Tightening torque: 15 + 3 N·m)



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

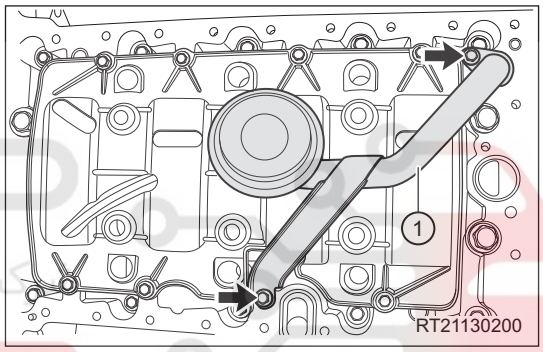
Oil Strainer

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. DO NOT remove oil filter until engine cools down.

1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Drain the engine oil (See page 20-11).
4. Remove the oil pan (See page 20-20).
5. Remove the oil strainer.
   a. Remove 2 fixing bolts (arrow) from the fuel strainer. (Tightening torque: 8 + 3 N·m)
   b. Remove the oil strainer (1) from the engine block frame.

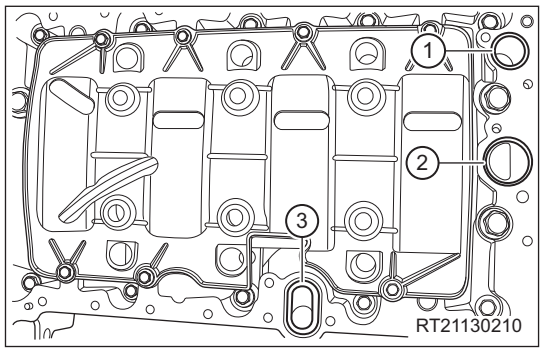


   c. Remove the oil strainer and its gasket.

Installation

Installation is in the reverse order of removal. Pay attention to the following points during installation:

1. Clean the oil strainer mesh.
2. Replace the grommet.
   - Oil strainer grommet (1)
   - Oil pump and oil pan connecting pipe grommet (2)
   - Oil filter and oil pan connecting pipe grommet (3)



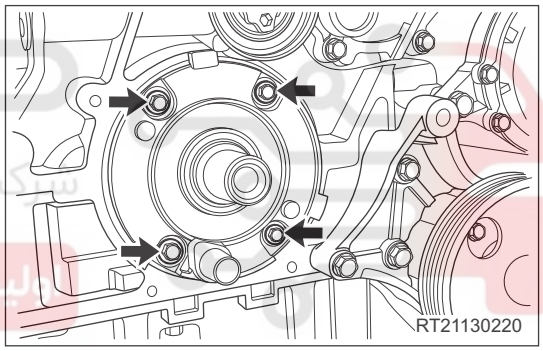
Oil Pump Assembly

⚠ WARNING

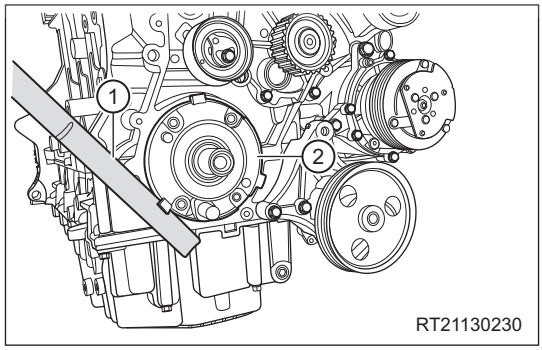
- DO NOT remove oil filter until engine cools down.
- Prolonged and repeated contact with engine oil will be harmful to your skin. If engine oil spills on your skin, wash it off immediately with water. In addition, the used engine oil contains potentially harmful contaminants, which may cause skin cancer.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

Removal

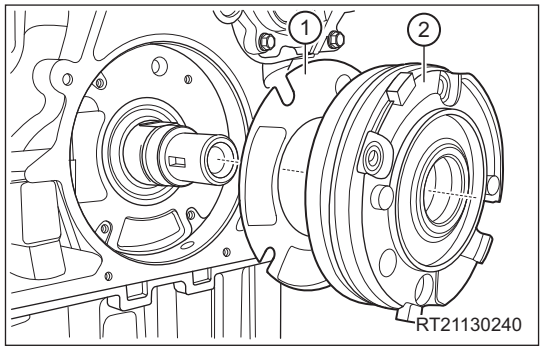
1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Drain the engine oil (See page 20-11).
4. Remove the front right wheel (See page 35-9).
5. Remove the engine accessory drive belt (See page 07-24).
6. Remove the engine timing belt (See page 07-29).
7. Remove the crankshaft front oil seal (See page 07-39).
8. Remove the oil pump assembly.
   a. Remove 4 fixing bolts (arrow) from the oil pump assembly.
   (Tightening torque: 17 - 23 N·m)



   b. Using a proper tool (1), pry out the oil pump assembly (2).



c. Remove the oil pump assembly (2) and oil pump assembly grommet (1) in order.



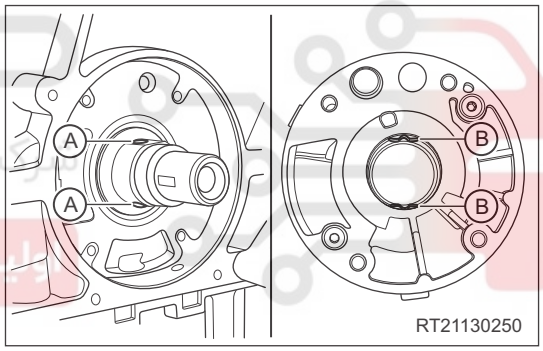
ENVIRONMENTAL PROTECTION

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

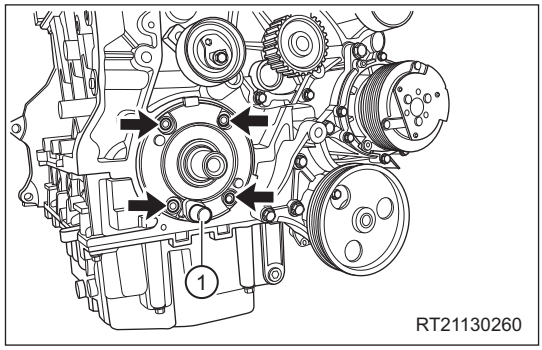
Installation

Installation is in the reverse order of removal. Pay attention to the following points during installation:

1. Replace the oil pump gasket and grommet.
2. Installation and alignment of oil pump:
   - Align the plane (B) of oil pump assembly with plane (A) of crankshaft as shown in the illustration.



   - The relief valve (flange on the pump) (1) on oil pump assembly is facing the outlet direction of cylinder block frame, and the side with characters should face upward.
   - Apply a proper amount of seal gum to the bolt mounting planes (arrow) before installing the oil pump assembly fixing bolts.



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