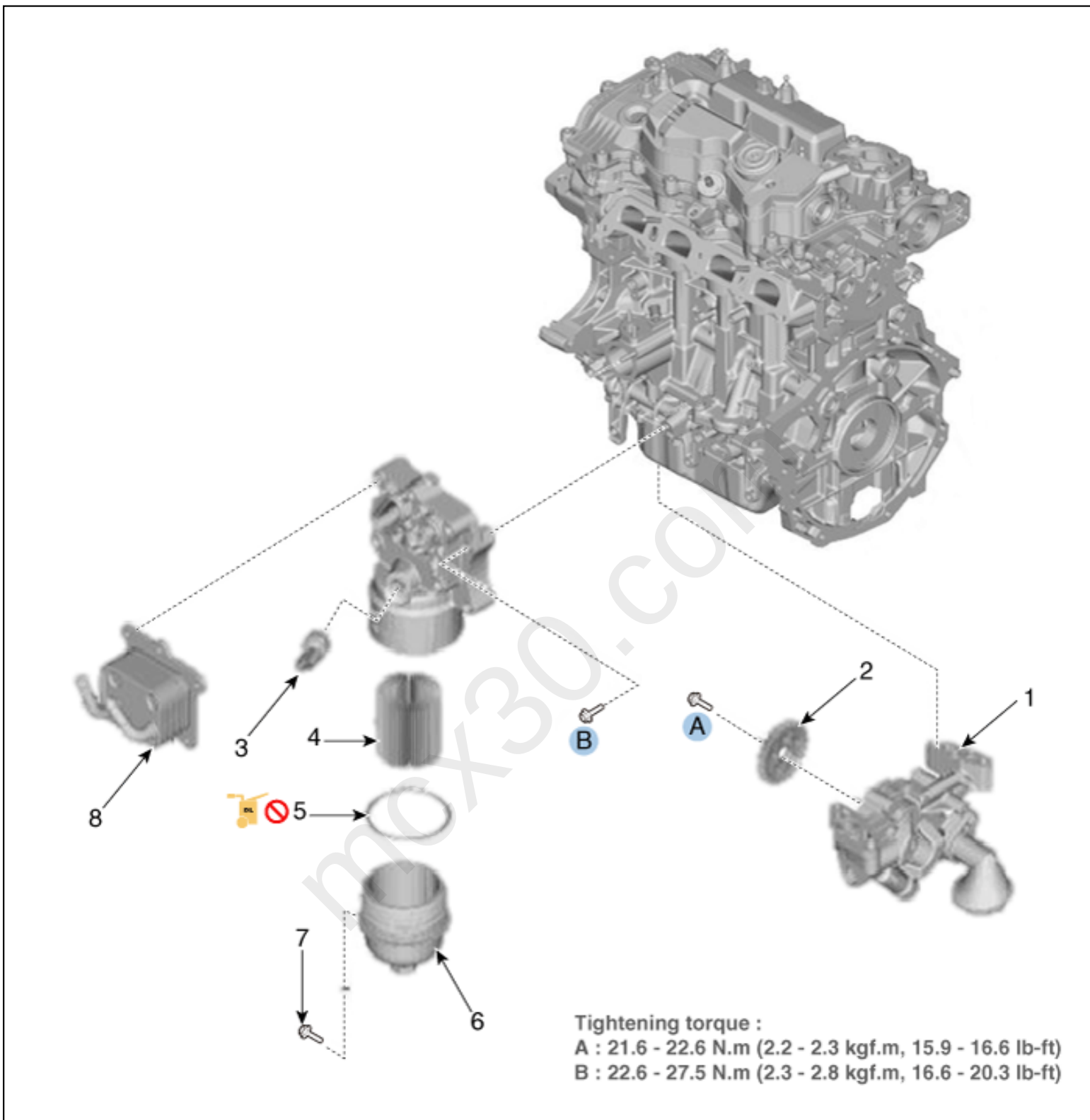


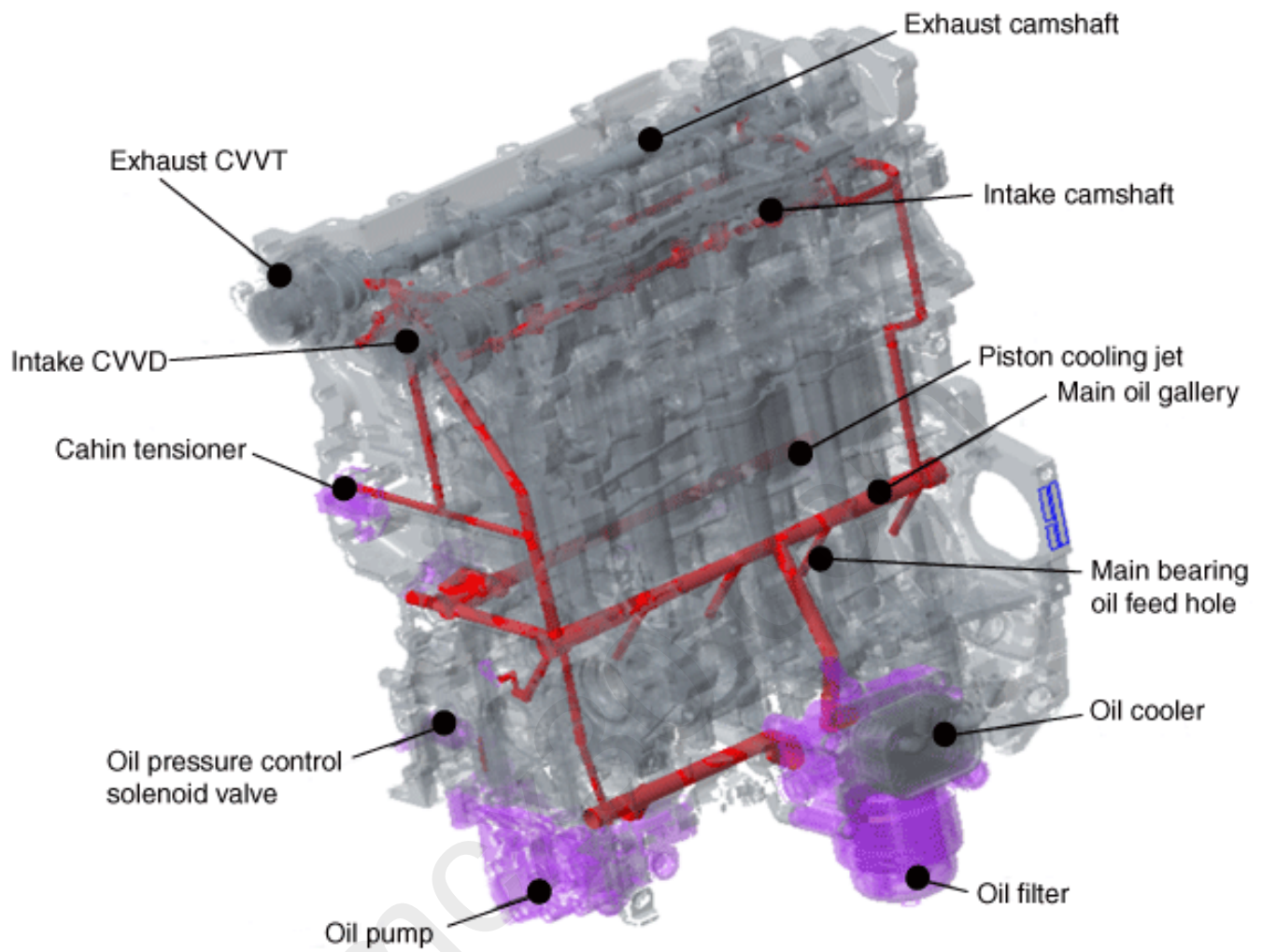
Components



1. Variable oil pump
2. Variable oil pump sprocket
3. Oil Pressure & temperature sensor
4. Oil filter

5. Filter cap O-ring
6. Filter cap
7. Safety pin
8. Oil cooler

Engine oil flow
diagram



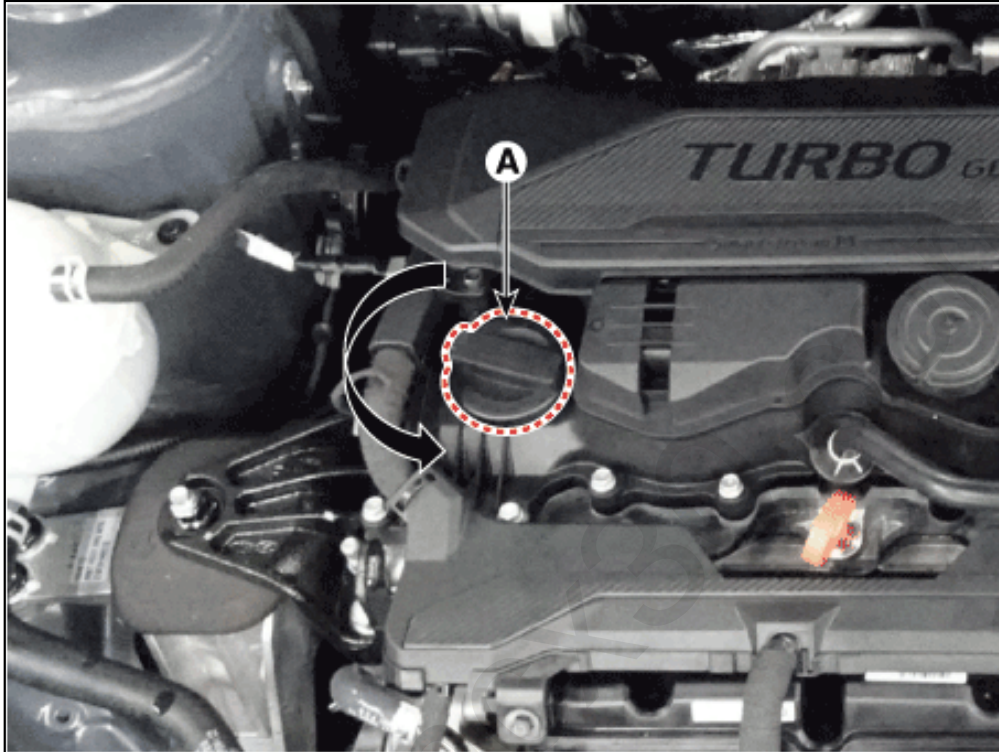
Replacement



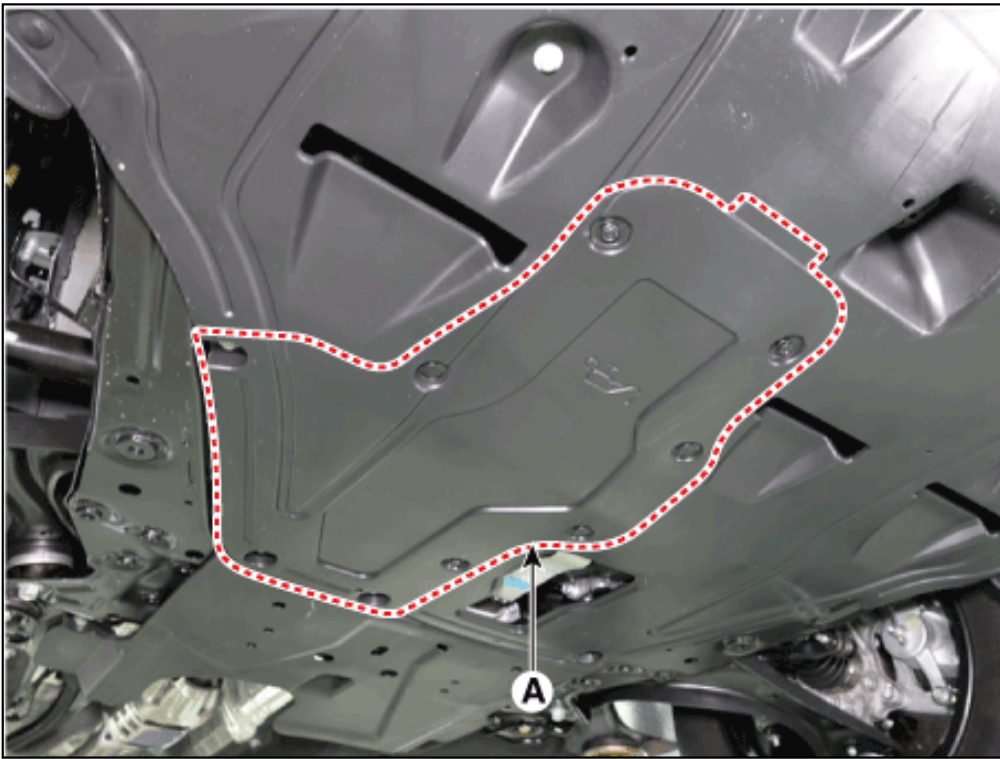
- Prolonged and repeated contact with mineral oil will result in the removal of natural fats from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants which may cause skin cancer.
- Exercise caution in order to minimize the length and frequency of contact of your skin to used oil. Wear protective clothing and gloves. Wash your skin thoroughly with soap and water, or use water-less hand cleaner, to remove any used engine oil. Do not use gasoline, thinners, or solvents.
- In order to preserve the environment, used oil and used oil filter must be disposed of only at designated disposal sites.

1. Drain the engine oil.

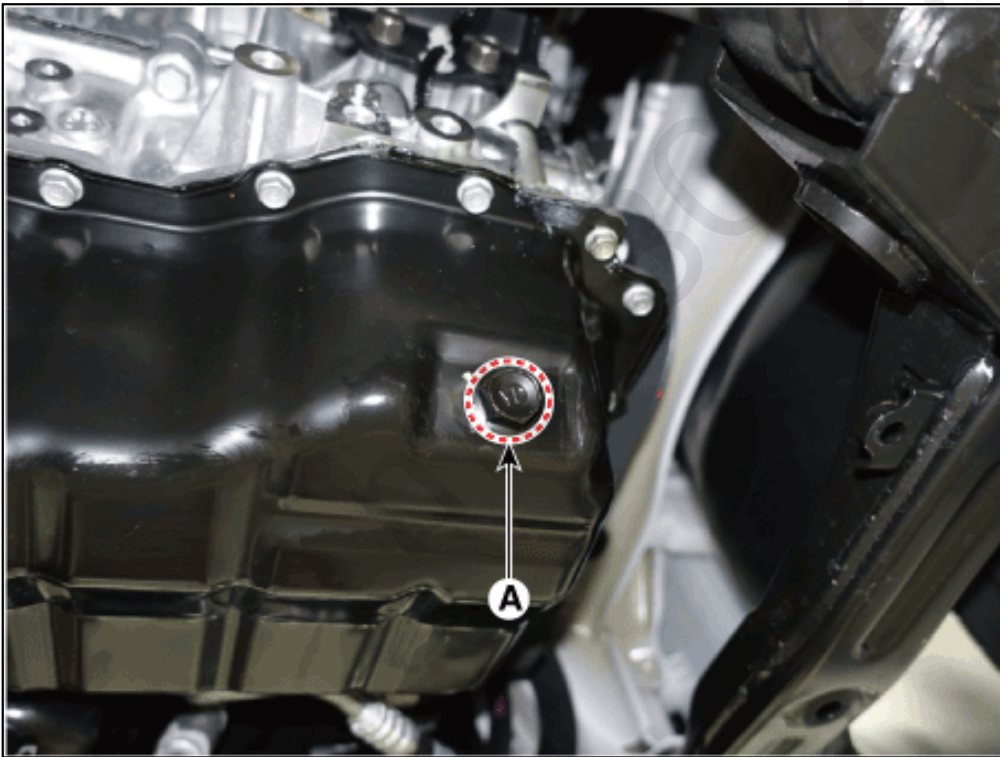
(1) Remove the oil filler cap (A).



(2) Remove the service cover (A).

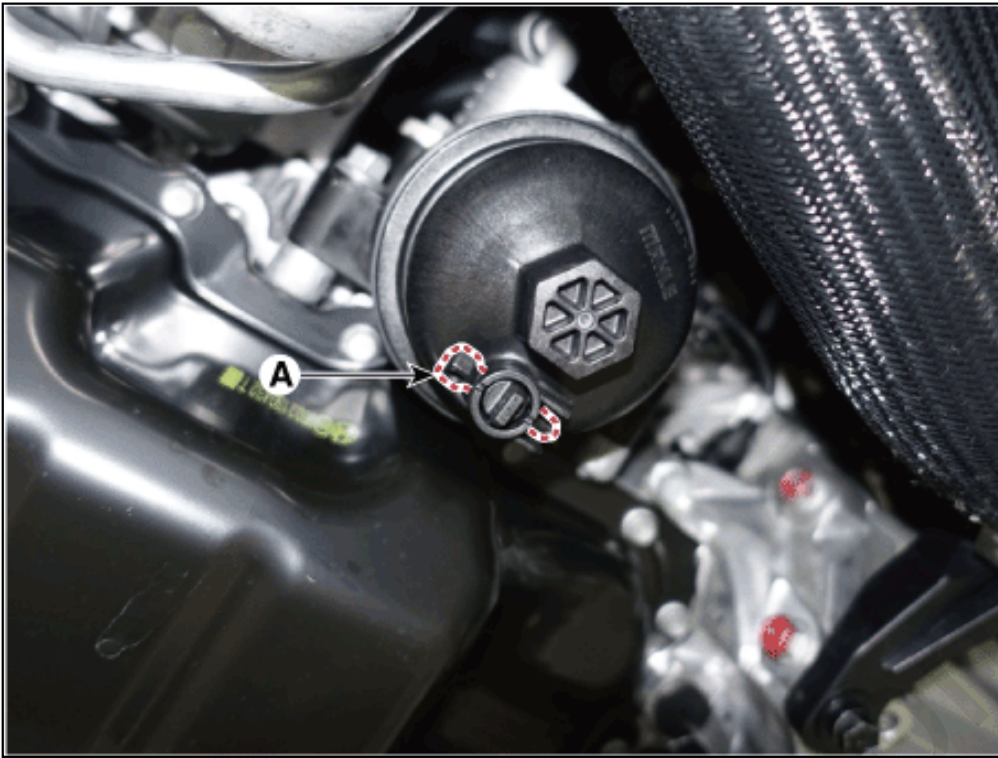


(3) Remove the oil drain plug (A), and drain the oil into a container.

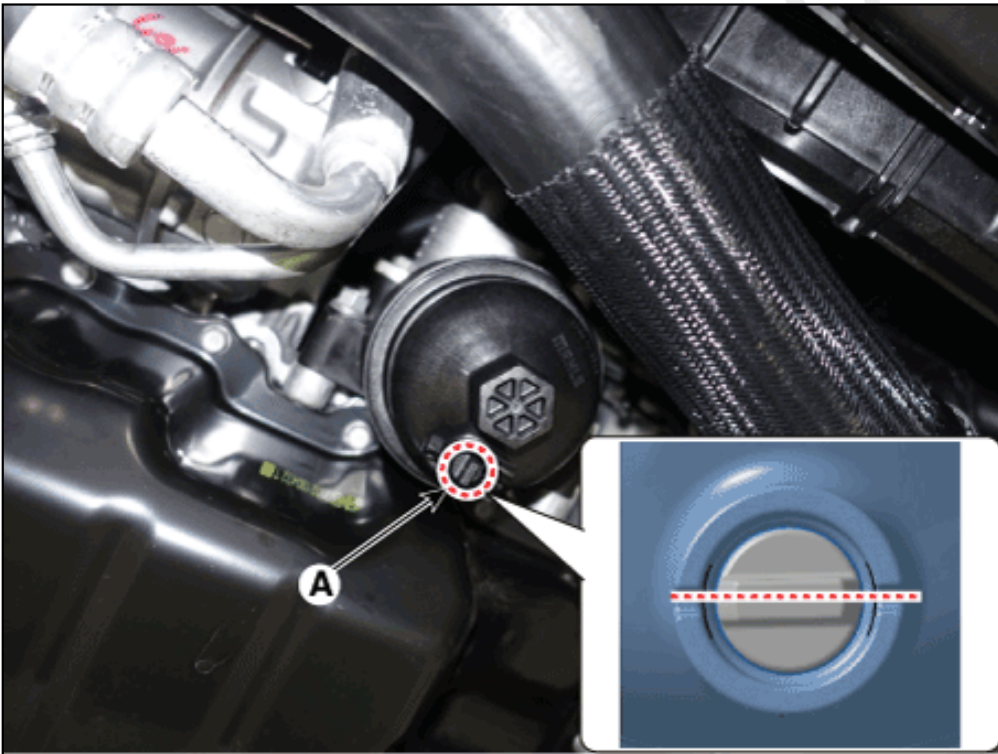


2. Replace the oil filter.

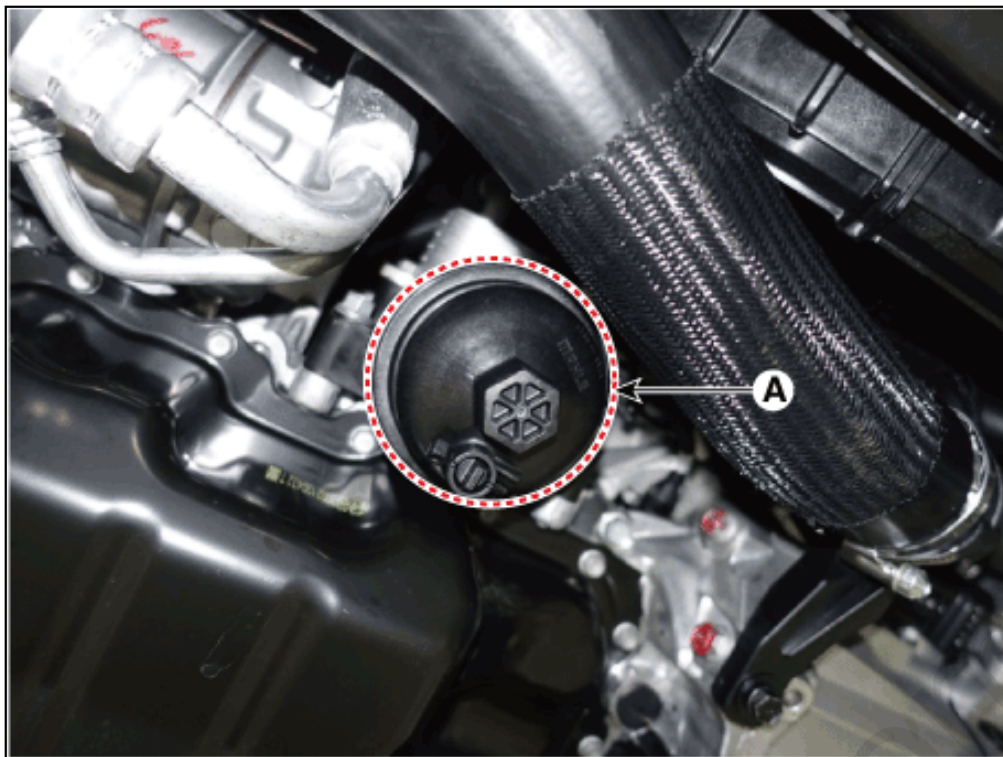
(1) Remove the safety pin (A).



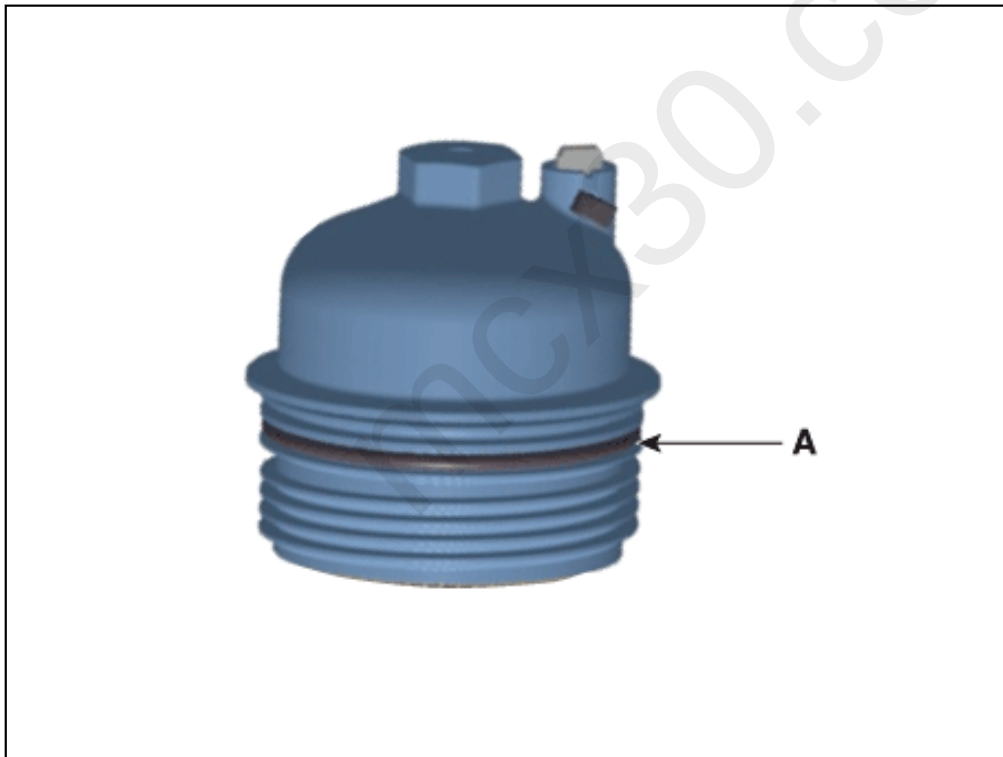
(2) Remove the pre-drain plug (A) by rotating it by 90° and then drain the engine oil in the oil filter.



(3) Using the socket wrench, remove the oil filter cap (A).

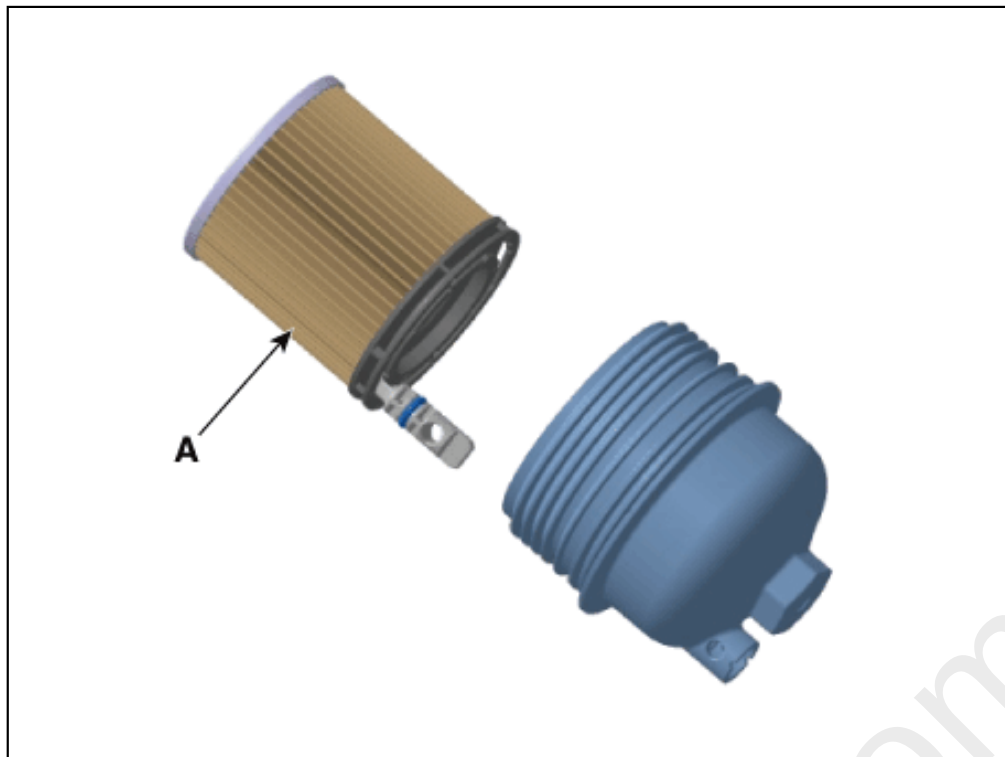


(4) Replace the new o-ring (A) on the oil filter cap.

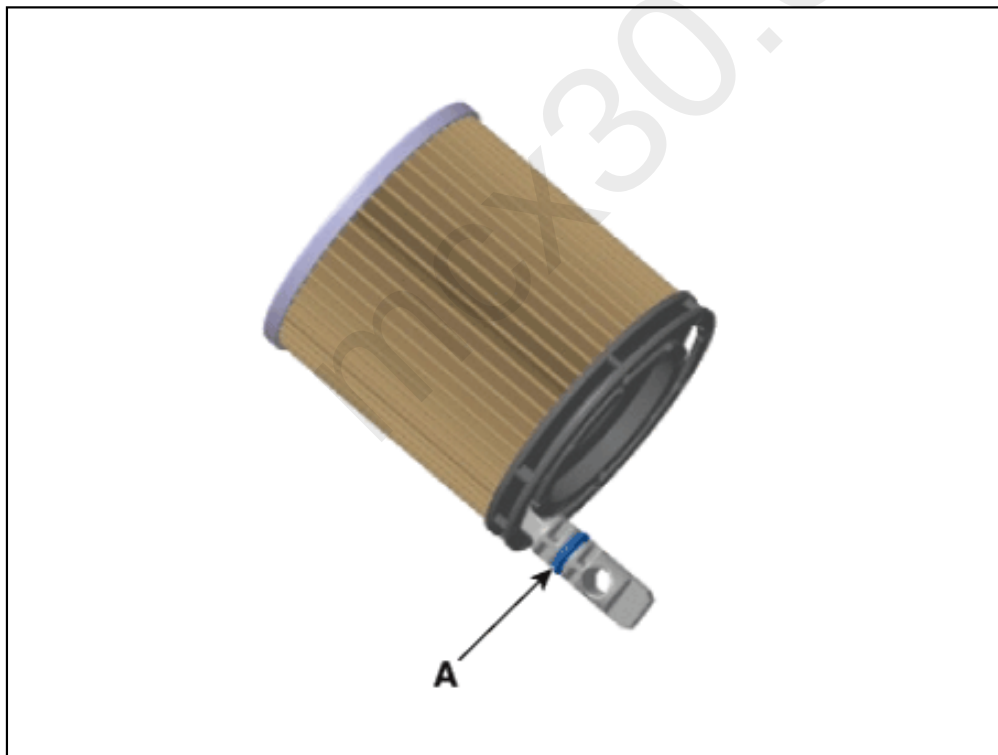


- Always use a new O-ring.
- Wipe off the oil and foreign substances remaining inside the filter housing, threads and cover cap threads as much as possible.
 - ※ If the residual oil is not removed, it may leak between the cover cap and the housing mating surfaces, which can be mistaken for oil leakage. (The amount of leaking oil and the leaking period may differ depending on the amount of residual oil)

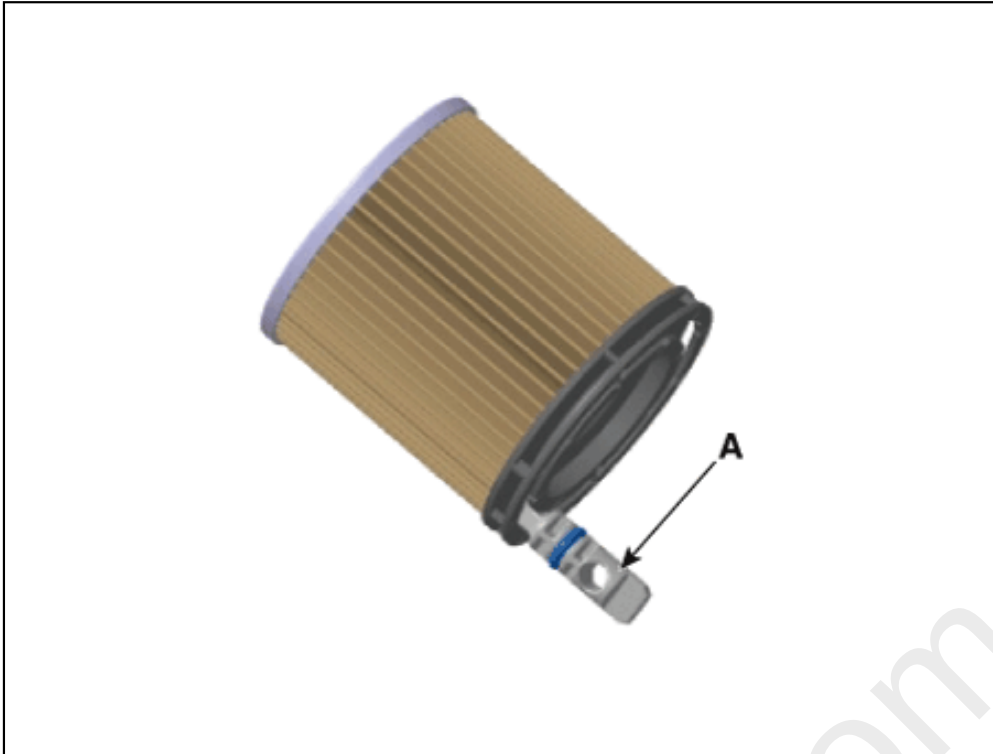
(5) Install the new oil filter (A).



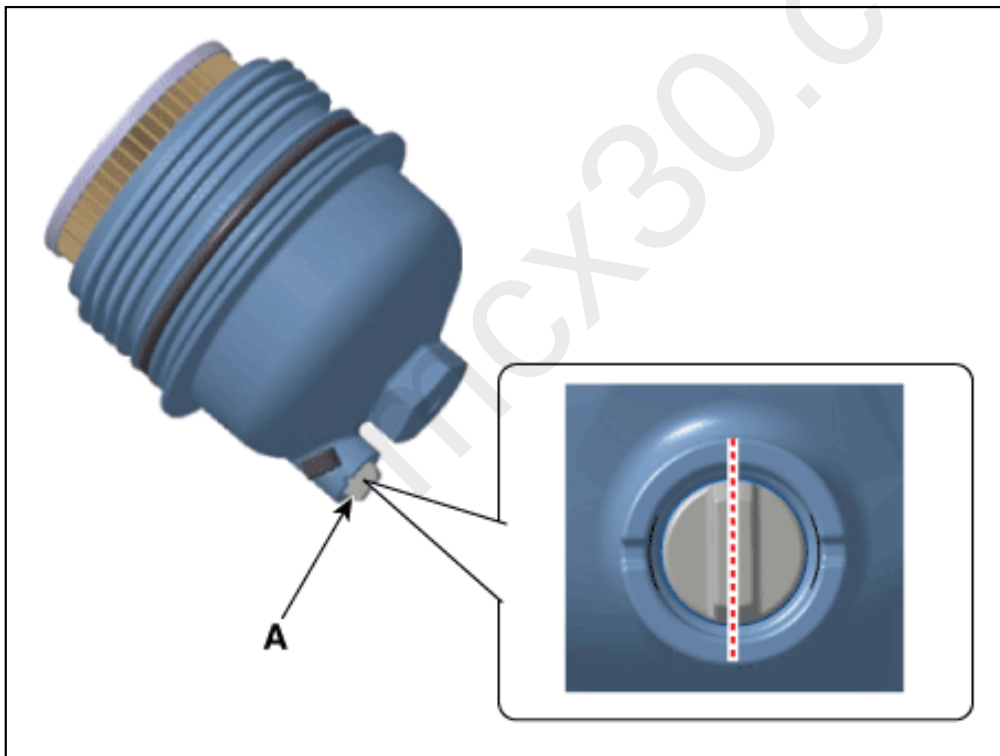
- When install the oil filter, apply engine oil to the drain plug O-ring (A).



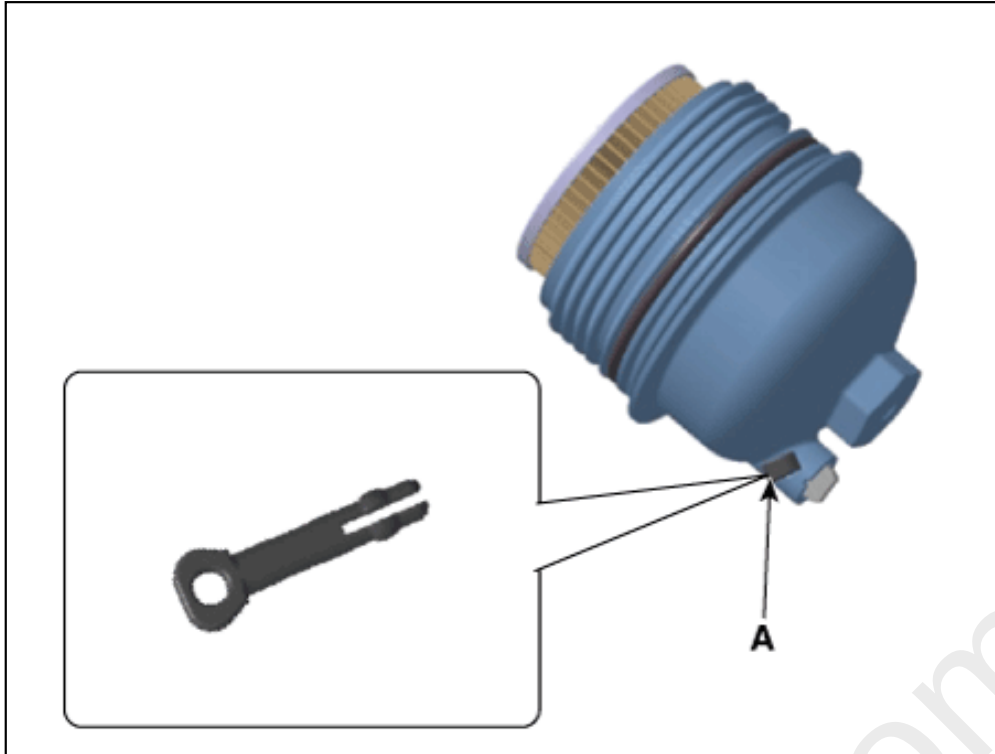
- Must use the drain plug (A) that is installed in a new oil filter.



- (6) Rotate the free drain plug (A) by 90° so that the drain pin is in the locked position.



(7) Install the new safety pin (A).



- Always use a new safety pin.

(8) Lightly tighten the O-ring of the oil filter cap until it contacts with the installed surface, then tighten the oil filter cap (A) to the specified torque using a socket wrench..

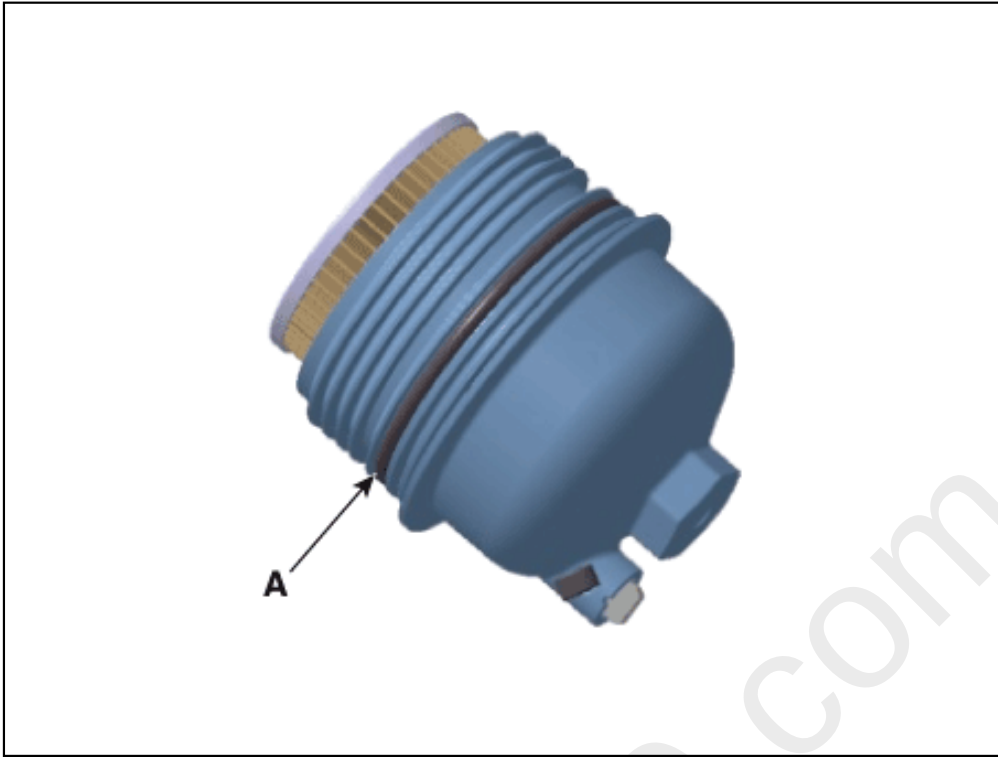
Tightening torque :

34.3 N.m (3.5 kgf.m, 25.3 lb-ft)





- Always use a new O-ring.
- When install the oil filter cap, Check if the new o-ring (A) is installed correctly the cap.
- When install the oil filter cap, apply engine oil to the new O-ring (A).



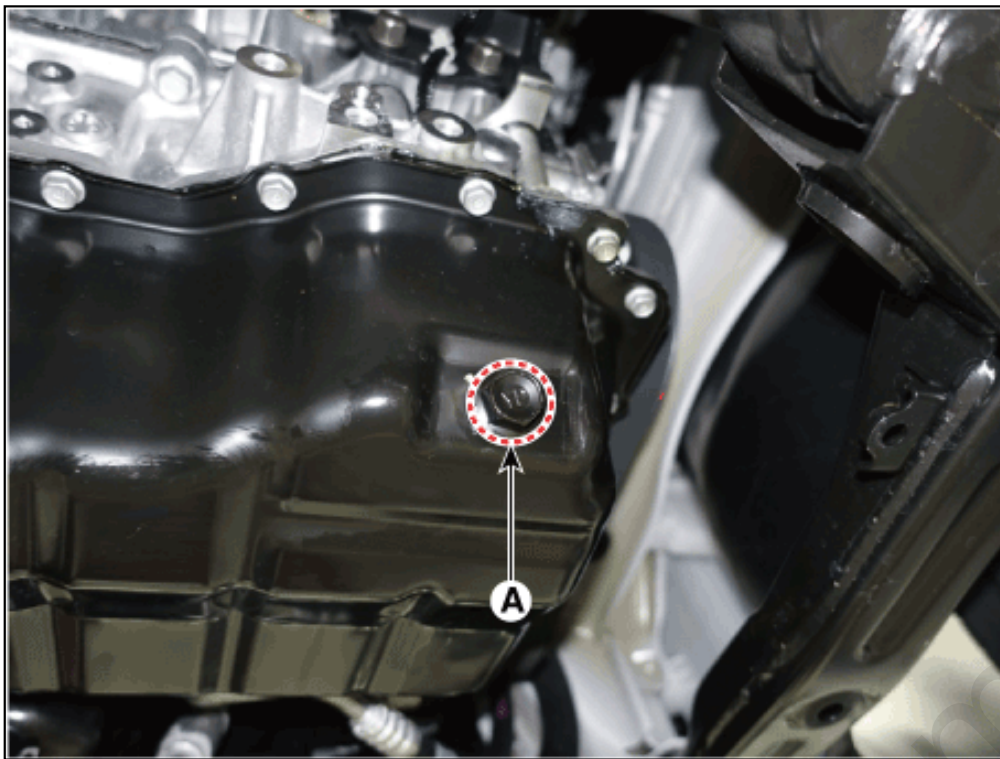
- Assemble the drain plug to the specified torque using a torque wrench.
※ When manually assembling the drain plug using a hexagonal wrench, it may result in the damage to the drain plug or leakage due to the failure to comply with the specified torque.

3. Refill with engine oil.

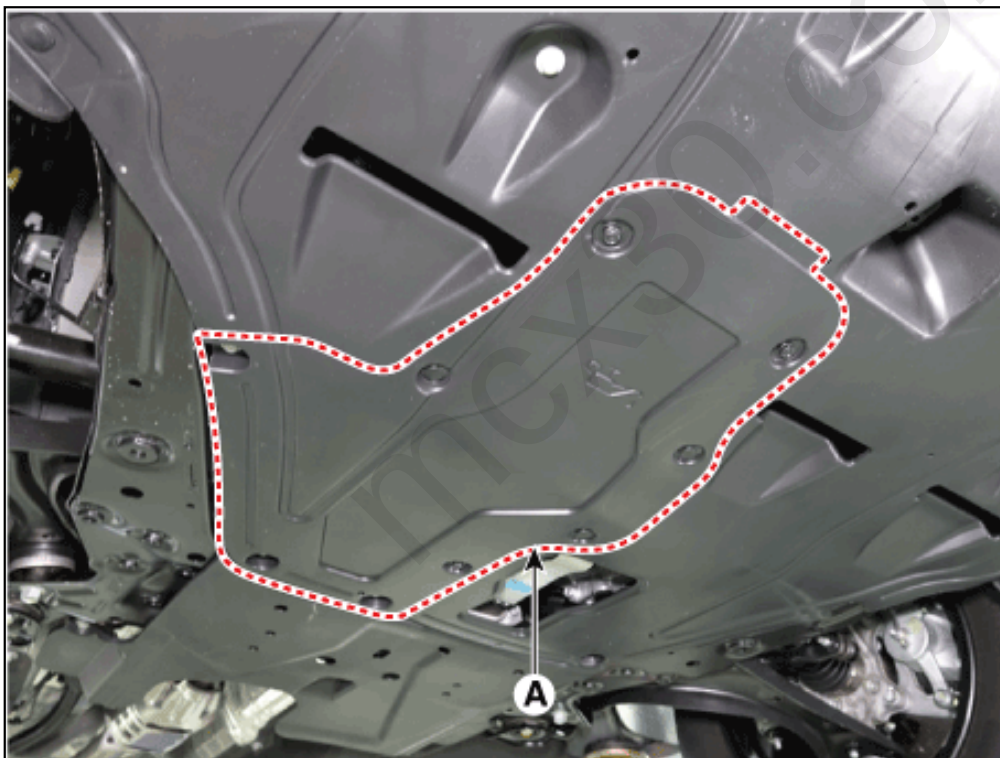
- (1) Install the oil drain plug (A) with a new gasket.

Tightening torque :

34.3 - 44.1 N.m (3.5 - 4.5 kgf.m, 25.3 - 32.5 lb-ft)



(2) Install the service cover (A).



(3) Fill with fresh engine oil.

Capacity

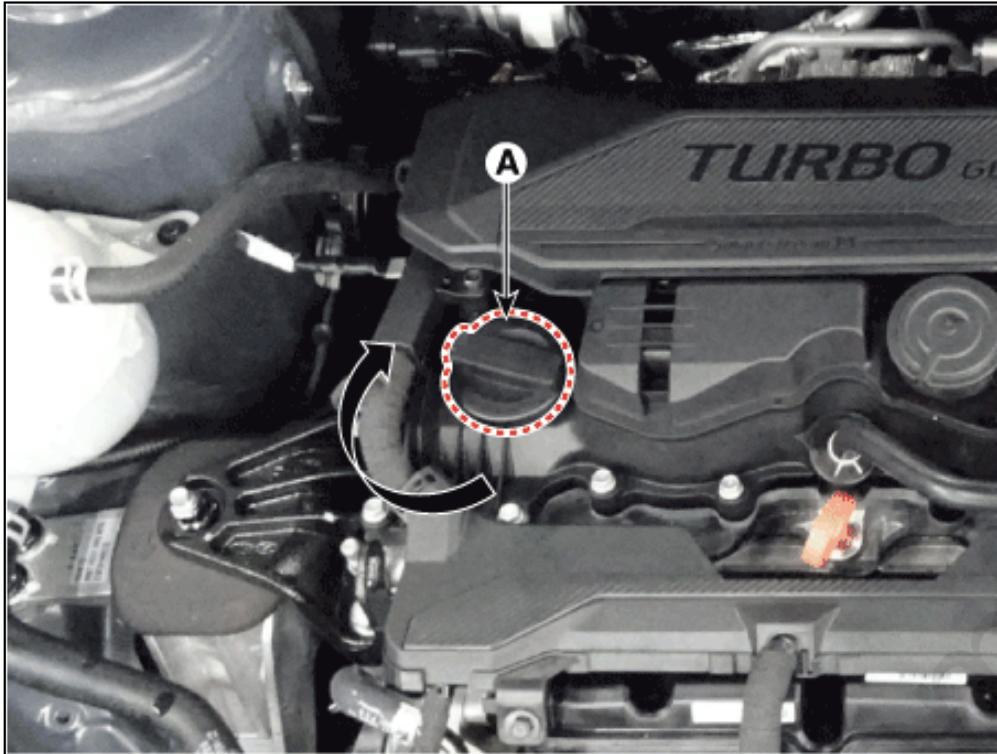
Total : 5.0 L (1.32 U.S.gal., 5.28 U.S.qt., 4.4 imp.qt.)

Oil pan : 4.4 L (1.16 U.S.gal., 4.65 U.S.qt., 3.87 imp.qt.)

Drain and refill including oil filter :

4.8 L (1.27 U.S.gal., 5.07 U.S.qt., 4.22 imp.qt.)

(4) Install the oil filler cap (A).



4. Engine and check for oil leaks.
5. Recheck the engine oil level.

Inspection

Engine Oil

1. Check the engine oil quality.

Check the oil deterioration, entry of water, discoloring or thinning.

If the quality is visibly poor, replace the oil.

2. Check the engine oil level.

After warming up the engine and then 10 minutes after the engine stop, oil level should be between the "L" and "F" marks in the dipstick.

If low, check for leakage and add oil up to the "F" mark.



- Do not fill with engine oil above the "F" mark.
- Check the oil level gauge, based on a condition in which the engine oil temperature is a room temperature (20°C – 25°C).
- Make sure the tire pressure falls within the normal range.
- When measuring engine oil, make sure the road surface is even.
- After draining engine oil, make sure you check the total amount of drained oil before injection.

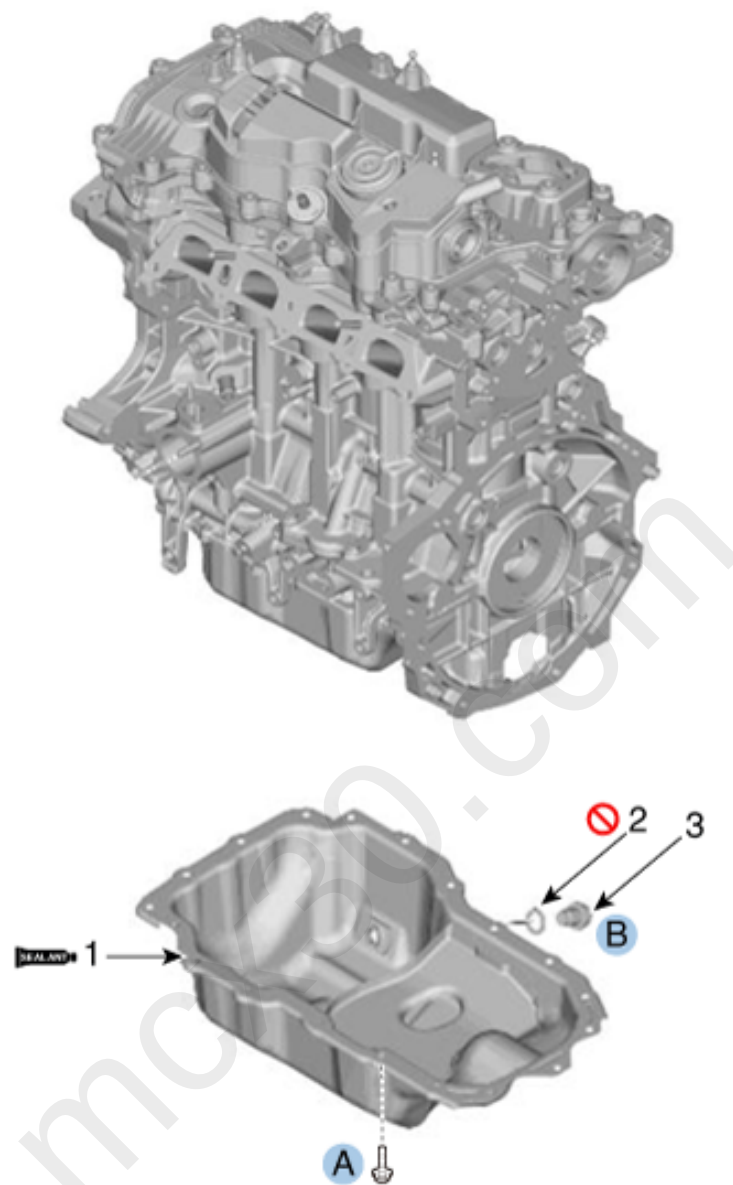
Selection of Engine Oil

Specification : SAE 0W-20, API SN PLUS (or above grade)

Allowed oil SAE viscosity : Refer to the recommended SAE viscosity number

TEMPERATURE RANGE OF SAE VISCOSITY NUMBERS										
Temperature	°C	-30	-20	-10	0	10	20	30	40	50
	°F	-10	0	20	40	60	80	100	120	
Allowed SAE Viscosity Grade										
					0W-20					

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Tightening torque :

A : 9.8 - 11.8 N.m (1.0 - 1.2 kgf.m, 7.2 - 8.7 lb-ft)

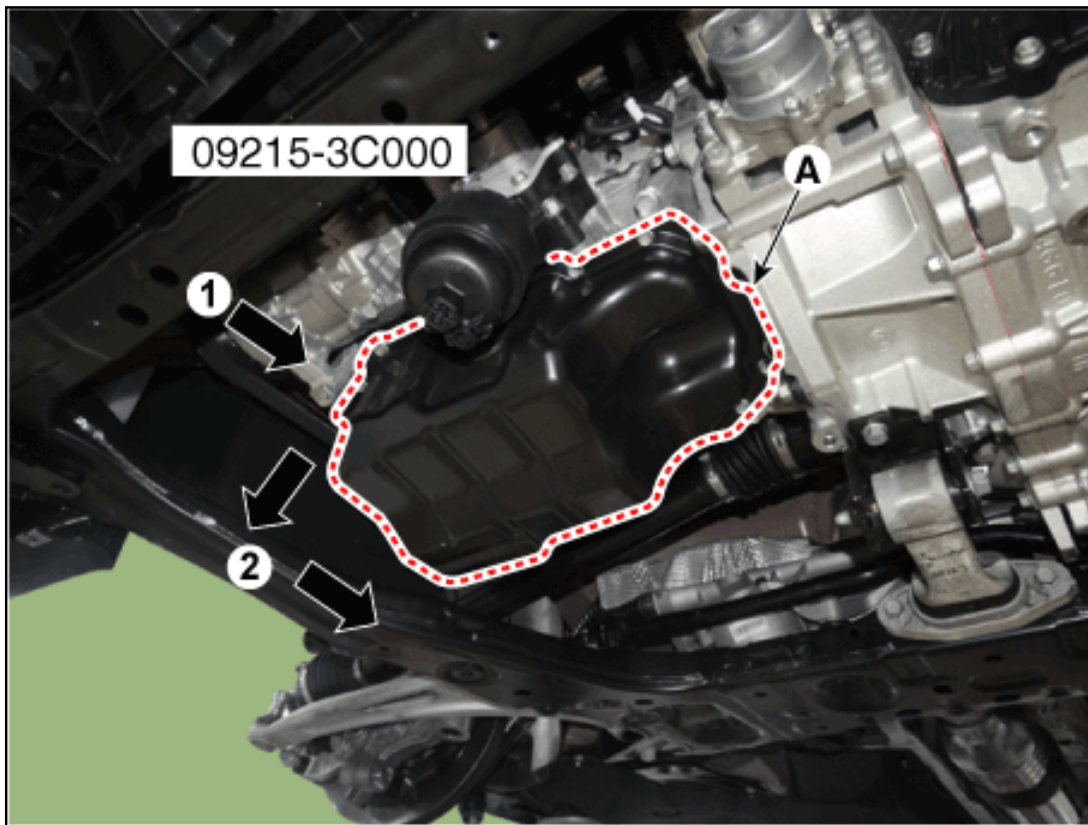
B : 34.3 - 44.1 N.m (3.5 - 4.5 kgf.m, 25.3 - 32.5 lb-ft)

- 1. Oil pan
- 2. Oil drain plug gasket

- 3. Oil drain plug

Removal

1. Remove the engine room under cover.
(Refer to Engine and Transaxle Assembly System - "Engine Room Under Cover")
2. Drain the engine oil.
(Refer to Lubrication System - "Engine Oil")
3. Using the SST (09215-3C000) and remove the oil pan (A).



- Insert the SST between the oil pan and the ladder frame by tapping it with a plastic hammer in the direction of ① arrow.
- After tapping the SST with a plastic hammer along the direction of ② arrow around more than 2/3 edge of the oil pan, remove it from the cylinder block.



- Do not turn over the SST abruptly without tapping. It will result in damage of the SST.

Installation

1. Install the oil pan.

- (1) Before assembling the oil pan, the surface where the sealant is applied to should be free from the hardened sealant, foreign matters, oil, dust, moisture and etc.
- (2) After applying liquid sealant on the oil pan, assemble it within 5 minutes.

Width : Ø 2.5 - 3.5 mm (0.0984 - 0.1378 in.)

Specification : MS721-40AA or AAO or above.

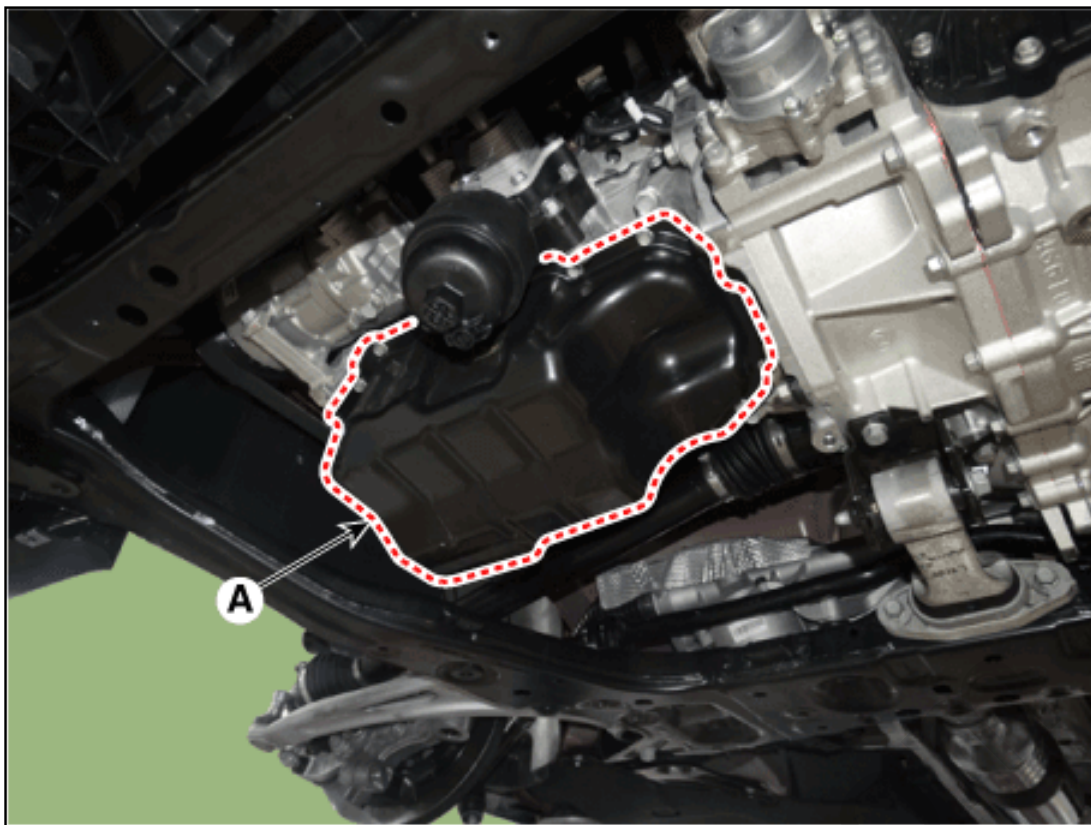


- When applying sealant gasket, sealant must not be protruded into the inside of oil pan.
- To prevent leakage of oil, apply sealant gasket to the inner threads of the bolt holes.
- If the sealant is applied to the bottom surface of the lower crankcase, it should be the same position as the oil pan.

- (3) Install the oil pan (A) with the bolts.
Uniformly tighten the bolts in several passes.

Tightening torque :

9.8 - 11.8 N.m (1.0 - 1.2 kgf.m, 7.2 - 8.7 lb-ft)



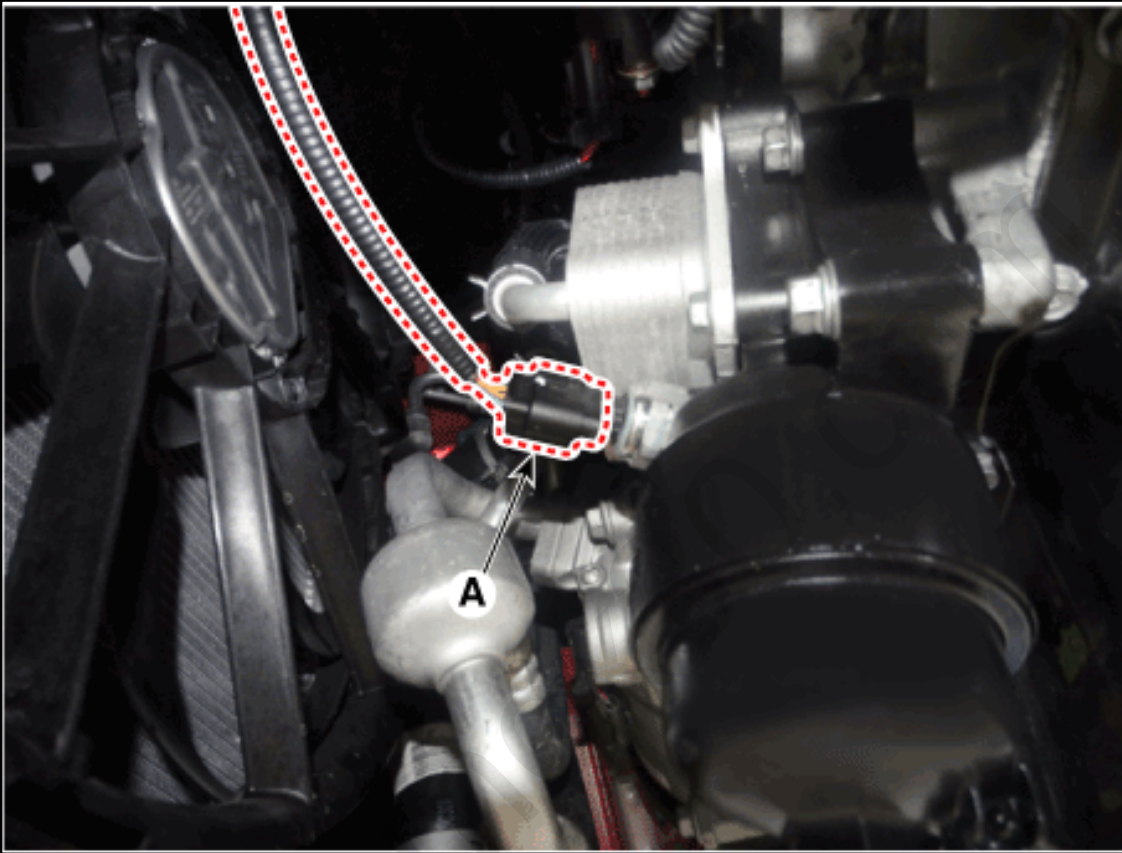
- After assembly, wait at least 30 minutes before filling the engine with oil.

2. Refill engine oil.

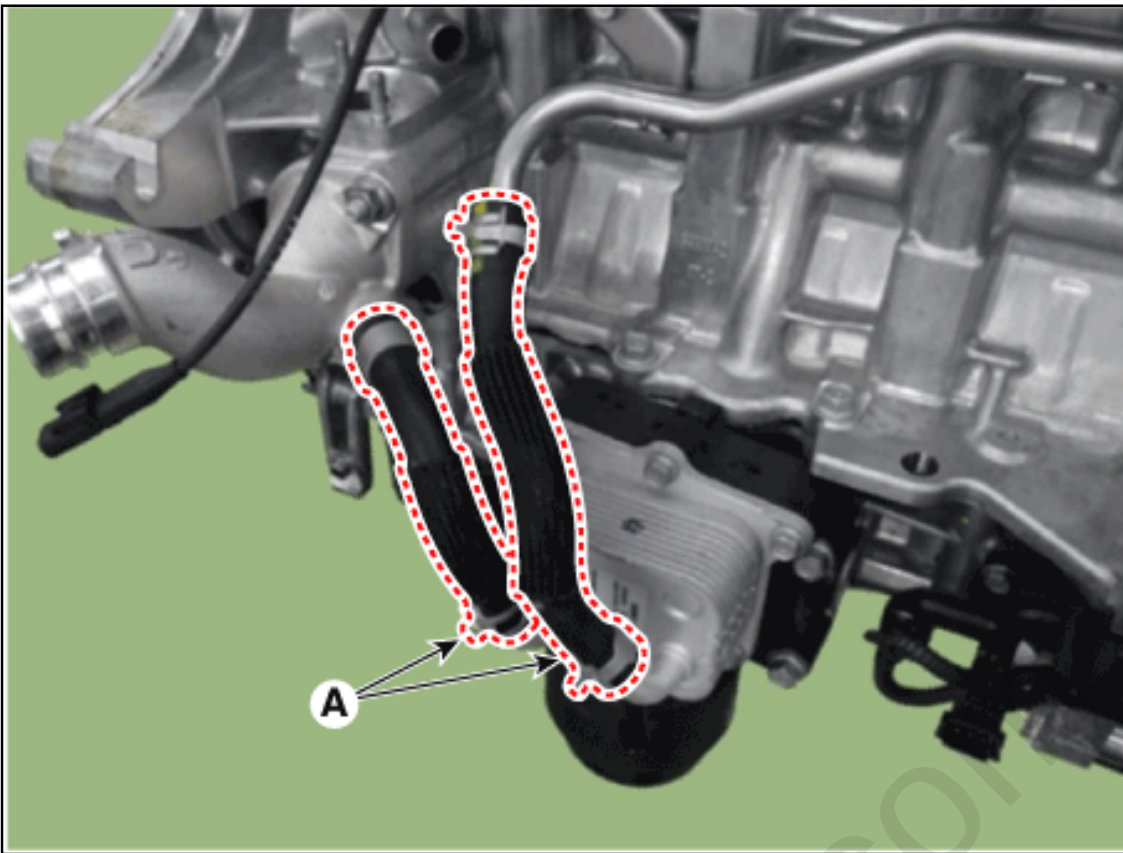
(Refer to Lubrication System - "Engine Oil")

Removal and
Installation

1. Disconnect the battery negative terminal.
2. Remove the engine room under cover.
(Refer to Engine and Transaxle Assembly - "Engine Room Under Cover")
3. Drain the coolant.
(Refer to Cooling System - "Coolant")
4. Drain the engine oil.
(Refer to Lubrication System - "Engine Oil")
5. Disconnect the oil pressure temperature sensor connector (A).



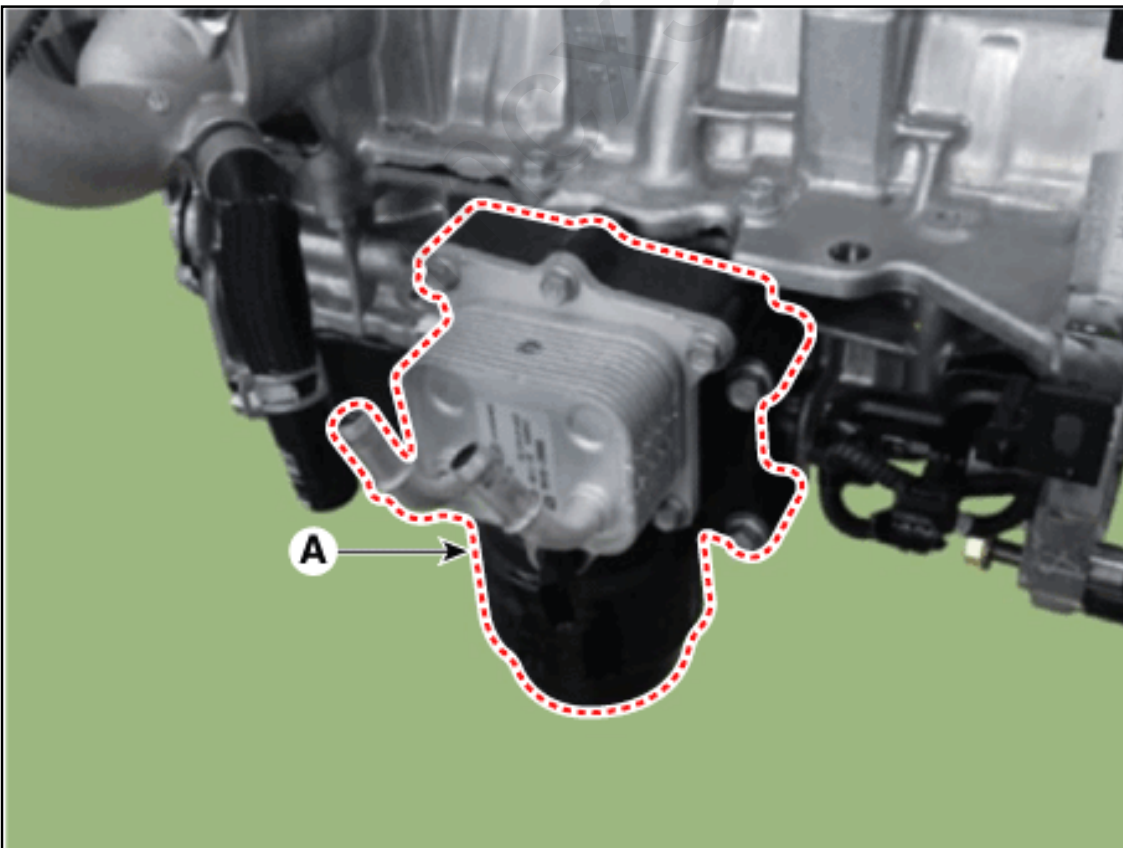
6. Disconnect the oil cooler hoses (A).



7. Remove the oil filter & cooler assembly (A).

Tightening torque :

22.6 - 27.5 N.m (2.3 - 2.8 kgf.m, 16.6 - 20.3 lb-ft)



8. Install the other parts in the reverse order of removal.

9. Refill with the engine oil.

(Refer to Lubrication System - "Engine Oil")

10. Fill the radiator with coolant.

(Refer to Cooling System - "Coolant")



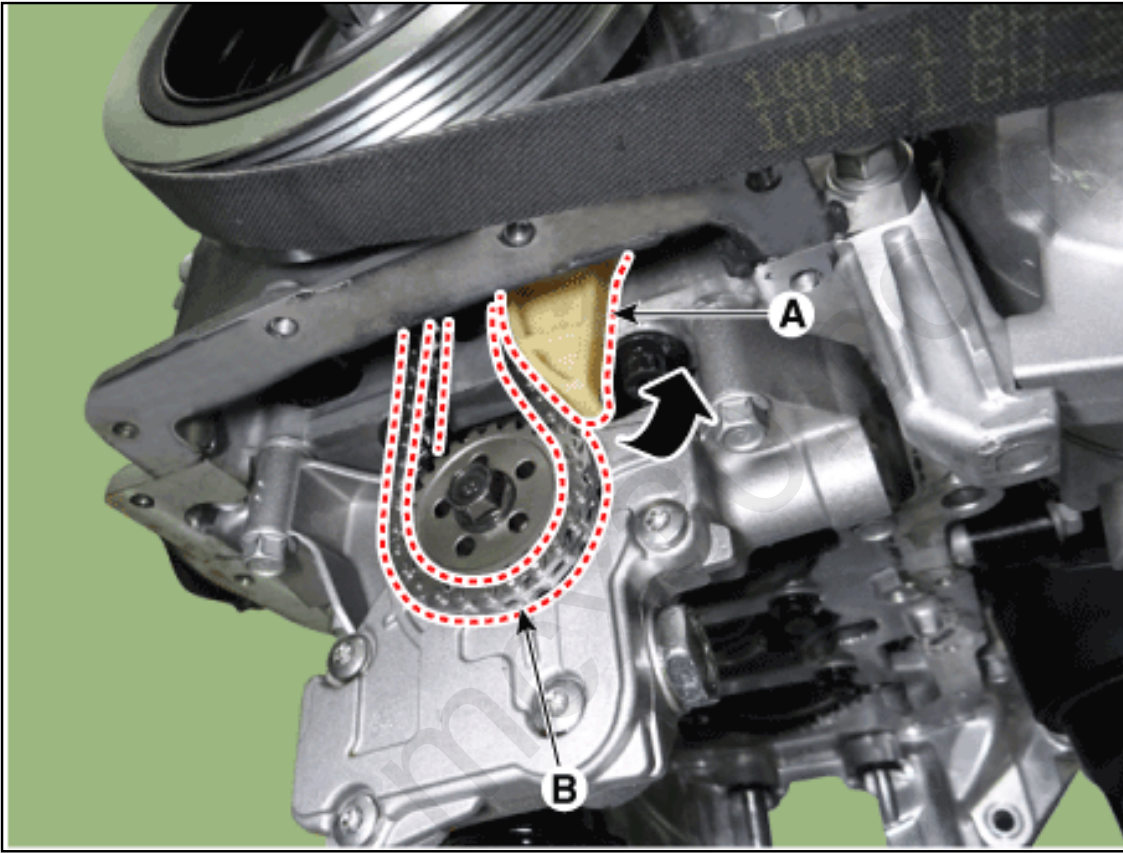
- The coolant must be injected according to the integrated thermal management module (ITM) coolant filling method.

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Removal and Installation

Oil Pump

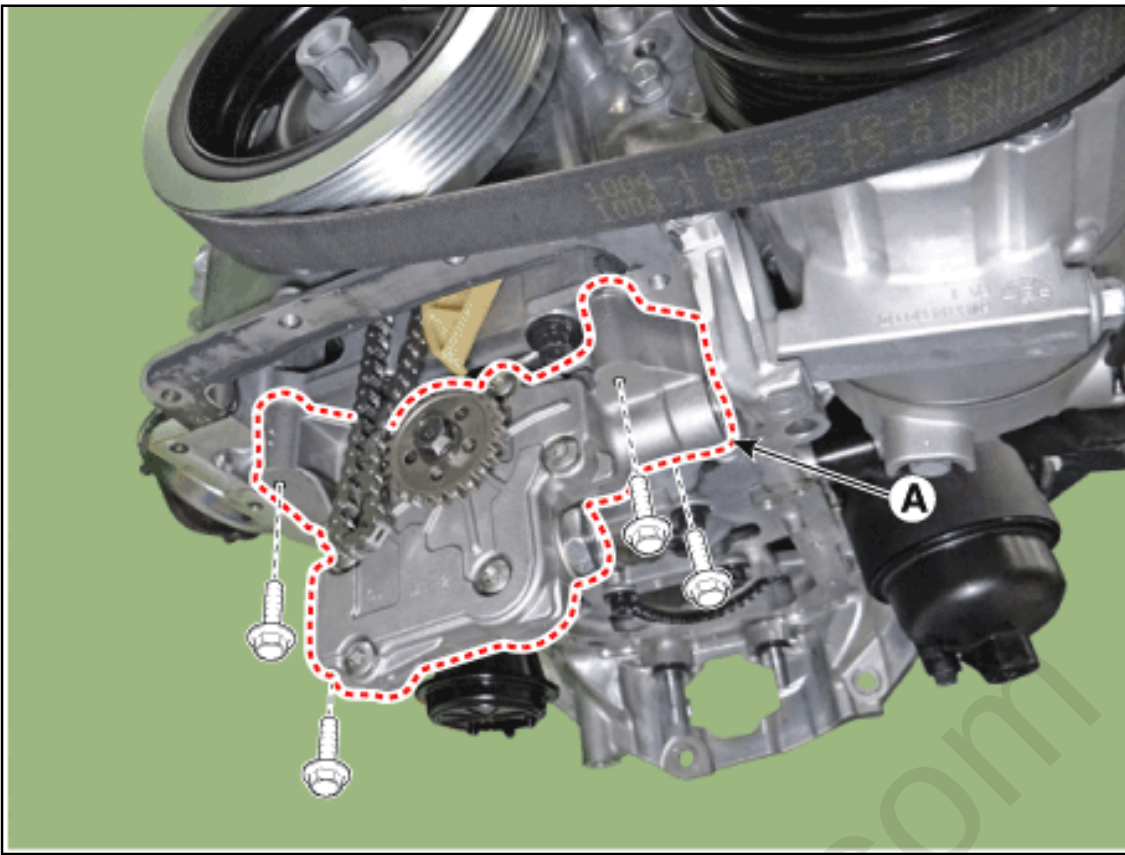
1. Remove the engine room under cover.
(Refer to Engine and Transaxle Assembly - "Engine Room Under Cover")
2. Drain the engine oil.
(Refer to Lubrication System - "Engine Oil")
3. Remove the oil pan.
(Refer to Lubrication System - "Oil Pan")
4. Turn the oil pump chain tensioner (A) in the direction of the arrow and remove the oil pump chain (B) from the oil pump.



5. Remove the oil pump (A).

Tightening torque :

18.6 - 23.5 N.m (1.9 - 2.4 kgf.m, 13.7 - 17.4 lb-ft)



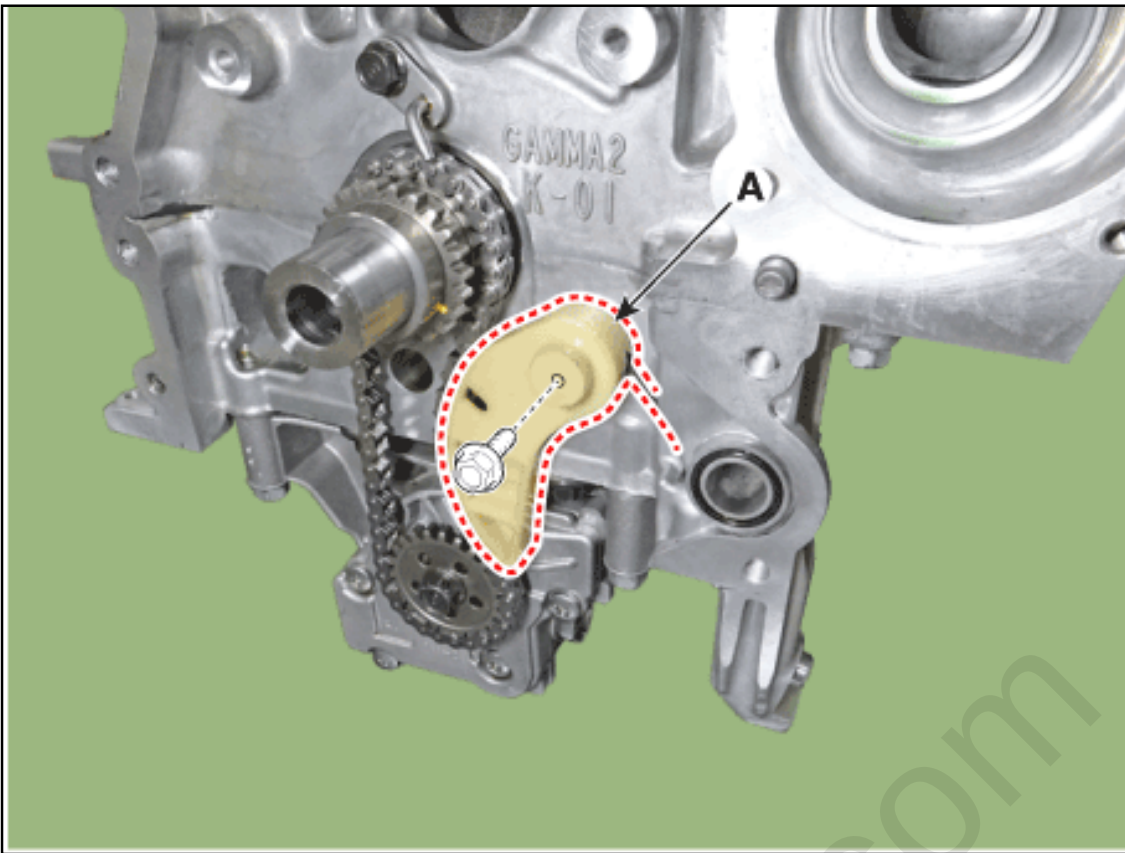
6. Install in the reverse order of removal.
7. Refill engine oil.
(Refer to Lubrication System - "Engine Oil")
8. Start engine and check for oil leaks.

Oil Pump Chain

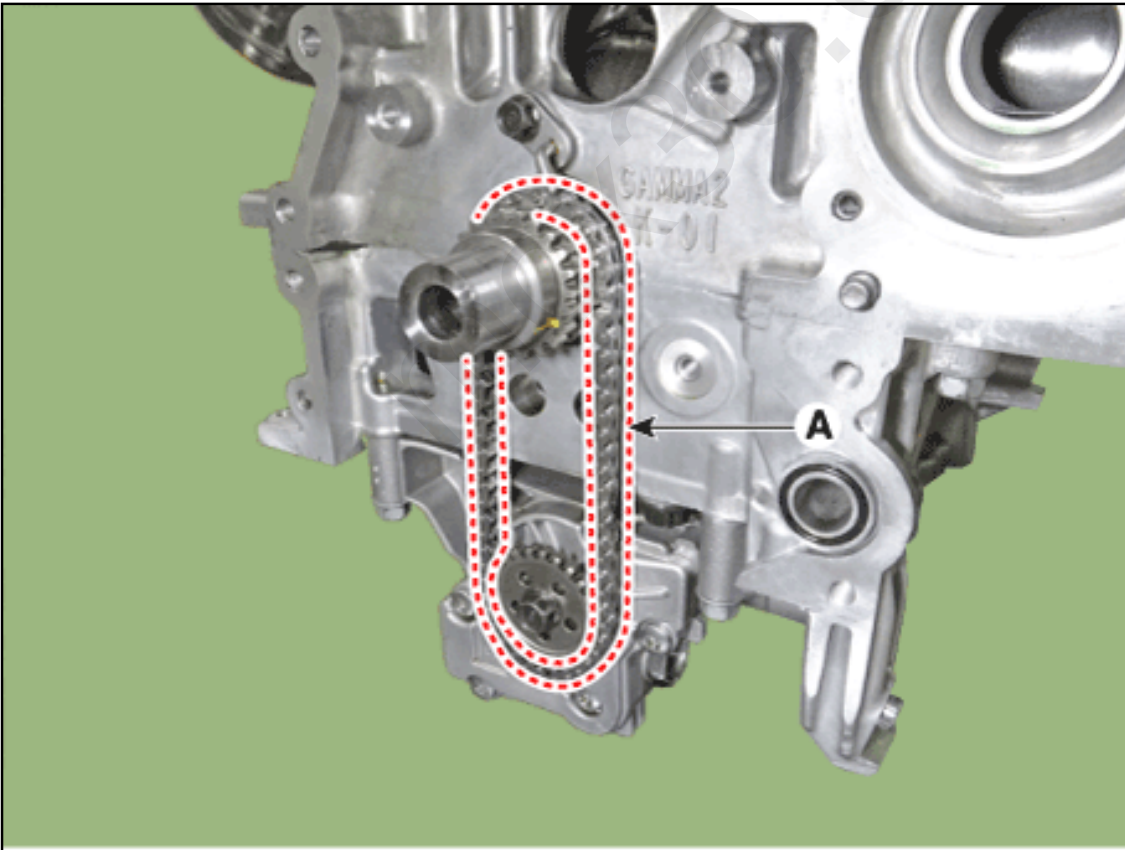
1. Disconnect the battery negative terminal.
2. Remove the timing chain.
(Refer to Timing System - "Timing Chain")
3. Remove the oil pump chain tensioner (A).

Tightening torque :

9.8 - 11.8 N.m (1.0 - 1.2 kgf.m, 7.2 - 8.7 lb-ft)



4. Remove the oil pump chain (A).



5. Install in the reverse order of removal.

6. Refill engine oil.

(Refer to Lubrication System - "Engine Oil")

Removal and Installation

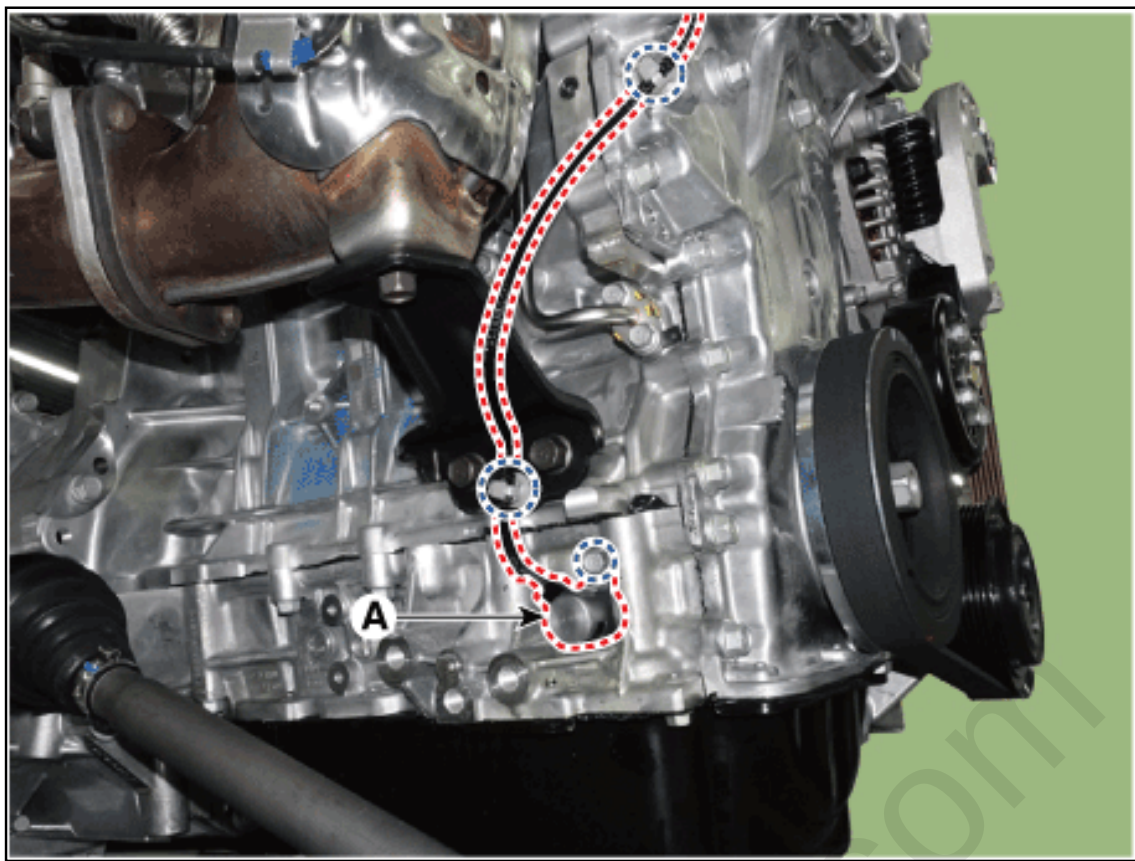
1. Disconnect the battery negative terminal.
2. Disconnect the oil pressure control solenoid valve connector (A).



3. Remove the engine room under cover.
(Refer to Engine and Transaxle Assembly System - "Engine Room Under Cover")
4. Remove the oil pressure control solenoid valve (A) after loosening the bolt and disconnecting the wiring fastener.

Tightening torque :

9.8 - 11.8 N.m (1.0 - 1.2 kgf.m, 7.2 - 8.7 lb-ft)



- When installing, apply engine oil to the O-ring.

5. Install in the reverse order of removal.