

			will be a noise at idle.	
		Remove the thermostat and inspect	<ul style="list-style-type: none"> Check if there are dusts or chips in the thermostat valve. Check adherence of the thermostat. 	<ul style="list-style-type: none"> Clean the thermostat valve and reuse the thermostat. Replace the thermostat, if it doesn't work properly.
Heated excessively	<ul style="list-style-type: none"> Engine overheated Thermogauge indicates 'HI' 	Visually check after removing the radiator cap.	<ul style="list-style-type: none"> Insufficient coolant or leakage. ※ Be careful when removing a radiator cap of the overheated vehicle. Check air in cooling system. 	<ul style="list-style-type: none"> After refilling coolant, recheck. Check the cylinder head gaskets for damage and the tightening torque of the mounting bolts.
		GDS check&Starting engine	<ul style="list-style-type: none"> Check DTCs Check the fan motor performance as temperature varies. Check if the fan clutch slips. Check the water pump adherence or impeller damaged. 	<ul style="list-style-type: none"> Check the engine coolant sensor, wiring and connectors. Check the fan motor, the relay and the connector. Replace the fan clutch, if it doesn't work properly. Replace the water pump, if it doesn't work properly.
		Immerse the thermostat in boiling water and inspection.	<ul style="list-style-type: none"> After removing the thermostat, check it works properly. ※ Check the thermostat opens at the valve opening temperature. 	<ul style="list-style-type: none"> Replace the thermostat, if it doesn't work properly.

Engine Mechanical System > Lubrication System > Engine Oil > Repair procedures

Engine Oil And Filter Replacement

CAUTION

- 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. Park the car on level ground.

Start the engine and let it warm up.

2. Drain engine oil.
 - (1) Remove the oil filler cap.
 - (2) After lifting the car, remove the oil drain plug and drain oil into a container.
3. Replace the oil filter.
 - (1) Remove the oil filter cap from the oil filter body.
 - (2) Remove the oil filter element.
 - (3) Check and clean the oil filter installation surface.
 - (4) Check the part number of a new oil filter is same as old one.
 - (5) Install a new oil filter element and new O-rings.
 - (6) Apply clean engine oil to the new O-ring.
Lightly screw the oil filter cap into place, and tighten it until the O-ring contacts the seat.
 - (7) Finally tighten it again by specified tightening torque.

Tightening torque :

25N.m (2.54kgf.m, 18.4lb-ft)

4. Fill new engine oil.
 - (1) Install the oil drain plug with a new gasket.

Tightening torque :

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

- (2) Fill with new engine oil, after removing the engine oil level gauge.

Capacity :

Total : 7.5 L (7.92 US qt, 6.59 Imp qt)

Oil pan : 6.0 L (6.34 US qt, 5.27 Imp qt)

Drain and refill including oil filter :

6.5 L (6.86 US qt, 5.71 Imp qt)

- A. Fill a half oil of the total amount first and do the rest again after about one minute later.
 - B. Do not fill oil over the 'F' line, checking the level with the oil level gauge.

- (3) Install the oil filler cap and oil level gauge.

5. Start the engine and check to be sure no oil is leaking from the drain plug or oil filter.

6. Recheck the engine oil level.

Inspection

1. Check the engine oil quality. Check the oil deterioration, addition of water or coolant, 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 5 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.

NOTE

Do not fill with engine oil above the "F" mark.

Selection Of Engine Oil

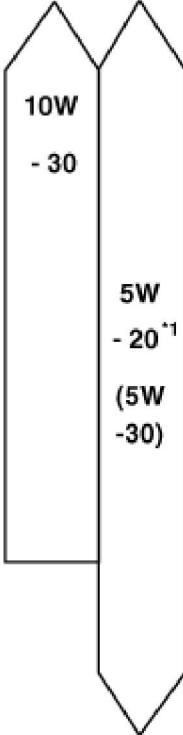
Recommendation : 5W-20/GF4&SM (If not available, refer to the recommended API or ILSAC classification and

SAE viscosity number.)

API classification : SL, SM or above

ILSAC classification : GF3, GF4 or above

SAE viscosity grade : Refer to the recommended SAE viscosity number.

Temperature range anticipated before next oil change	Recommended SAE viscosity number
<p>- 18°C - 0.4°F</p>	

*1 If 5W-20 / GF4 engine oil is not available, 5W-30 or secondary recommended engine oil for corresponding temperature range can be used.

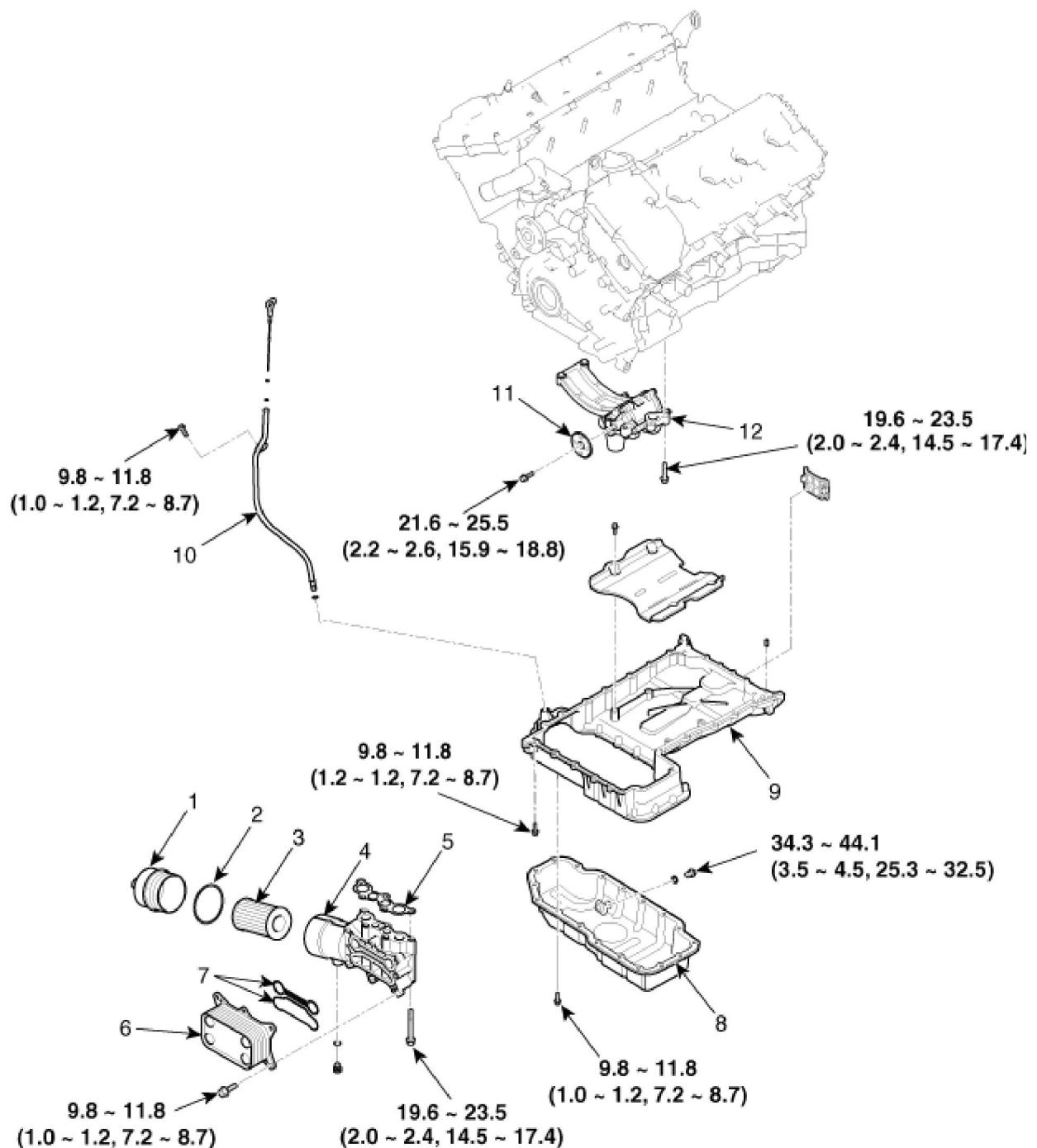
NOTE

For best performance and maximum protection of all types of operation, select only those lubricants which :

1. Satisfy the requirement of the API or ILSAC classification.
2. Have proper SAE grade number for expected ambient temperature range.
3. Lubricants that do not have both an SAE grade number and API or ILSAC service classification on the container should not be used.

Engine Mechanical System > Lubrication System > Oil Pump > Components and Components Location

Components



Torque : N.m (kgf.m, lb-ft)

1. Oil filter cap	5. Oil filter assembly gasket	9. Upper oil pan
2. Oil filter cap O-ring	6. Oil cooler	10. Oil level gauge
3. Oil filter	7. Oil cooler gasket	11. Oil pump sprocket
4. Oil filter body	8. Lower oil pan	12. Oil pump assembly

Engine Mechanical System > Lubrication System > Oil Pump > Repair procedures

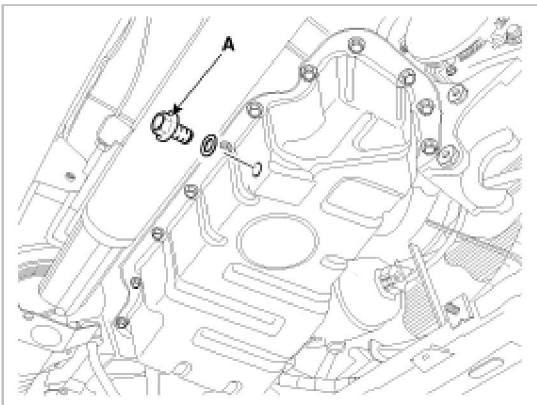
Removal

1. Remove the sub frame. (Refer to SS group)

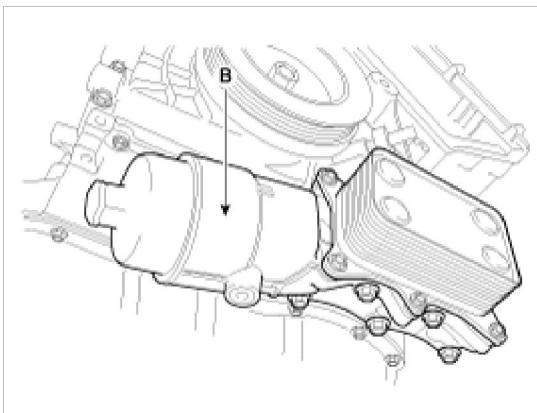
2. Drain engine oil.

(1) Remove the oil filler cap.

(2) After lifting the car, remove the oil drain plug and drain oil into a container.

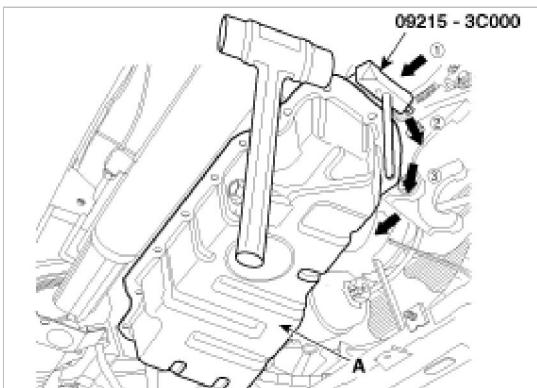


3. Remove the oil filter & cooler assembly (B).



4. Remove the lower oil pan(A).

Insert the blade of SST(09215-3C000) between the upper oil pan and the lower oil pan. Cut off applied sealer and remove the lower oil pan.

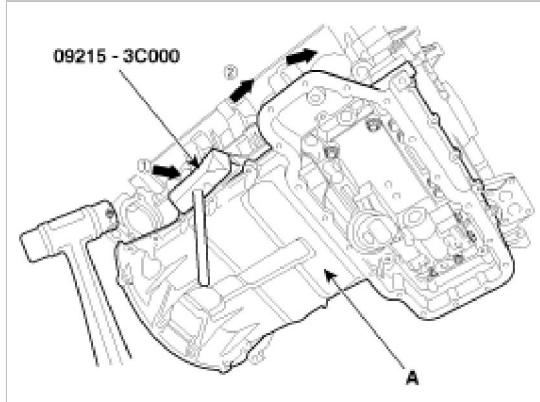


NOTE

- Insert the SST between the lower oil pan and the upper oil pan 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 lower oil pan, remove it from the lower oil pan.
- Do not use the SST as a prybar. Hold the tool in position (on the gasket line) and tap in with a light hammer.
- Be careful not to damage the contact surfaces of Upper oil pan and lower oil pan.

5. Remove the upper oil pan (A).

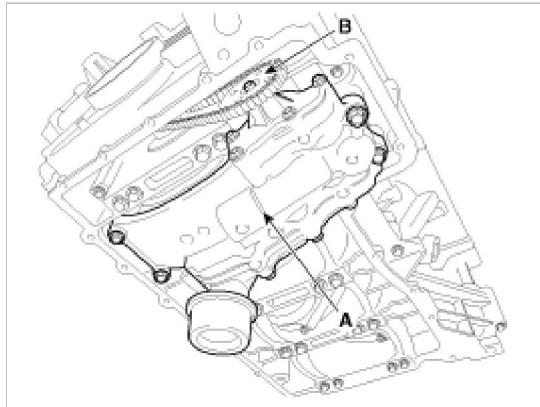
Insert the blade of SST(09215-3C000) between the upper oil pan and the cylinder block. Cut off applied sealer and remove upper oil pan.



NOTE

- Insert the SST between the upper oil pan and the cylinder block 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 upper oil pan, remove it from the upper oil pan.
- Do not use the SST as a prybar. Hold the tool in position (on the gasket line) and tap in with a light hammer.
- Be careful not to damage the contact surfaces of Upper oil pan and cylinder block.

6. Remove the oil pump assembly (A) after remove the oil pump sprocket (B).



Installation

1. Install the oil pump assembly (A) and then oil pump sprocket (B).

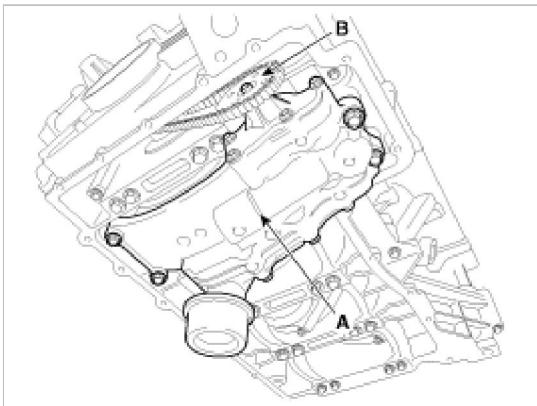
Tightening torque :

Oil pump assembly bolts :

19.6 ~ 23.5Nm (2.0 ~ 2.4kgf.m, 14.5 ~ 17.4lb-ft)

Oil pump sprocket bolts :

21.6 ~ 25.5Nm (2.2 ~ 2.6kgf.m, 15.9 ~ 18.8lb-ft)



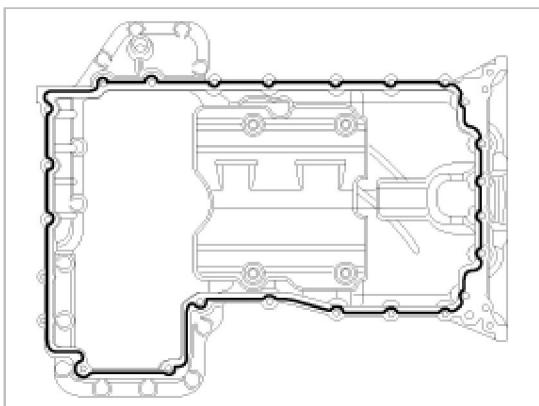
2. Install the upper oil pan.

(1) Using a gasket scraper, remove all the old gasket material from the gasket surfaces.

(2) Before assembling the oil pan, the liquid sealant TB1217H or LT5900H should be applied on upper oil pan.

The part must be assembled within 5 minutes after the sealant was applied.

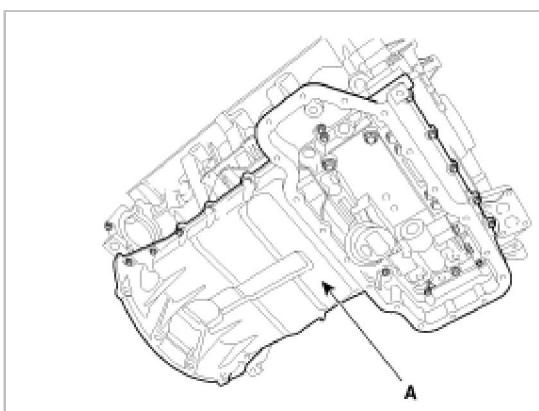
Bead width : 2.5mm(0.1in)



NOTE

- Clean the sealing face before assembling two parts.
- Remove harmful foreign materials on the sealing face before applying sealant.
- When applying sealant gasket, sealant must not protrude into the inside of oil pan.
- To prevent leakage of oil, apply sealant gasket to the inner threads of the bolt holes.

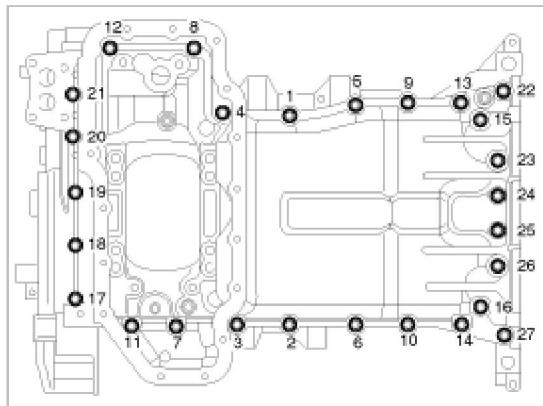
(3) Install the upper oil pan.



Uniformly tighten the bolts in several passes.

Tightening torque :

9.8 ~ 11.8Nm (1.0 ~ 1.2kgf.m, 7.2 ~ 8.7lb·ft)



3. Install the lower oil pan.

(1) Using a gasket scraper, remove all the old packing material from the gasket surfaces.

(2) Before assembling the oil pan, the liquid sealant TB1217H or LT5900H should be applied on lower oil pan. The part must be assembled within 5 minutes after the sealant was applied.

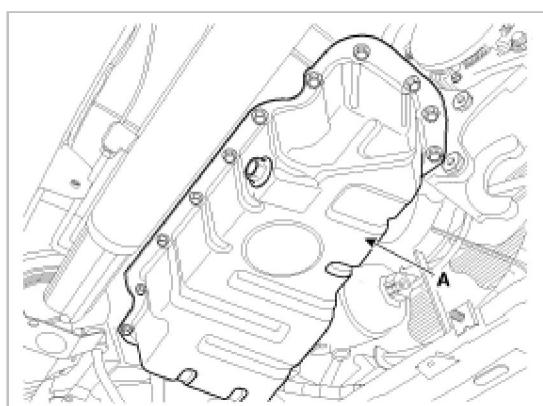
Bead width : 2.5mm(0.1in)



NOTE

- Clean the sealing face before assembling two parts.
- Remove harmful foreign materials on the sealing face before applying sealant.
- When applying sealant gasket, sealant must not protrude into the inside of oil pan.
- To prevent leakage of oil, apply sealant gasket to the inner threads of the bolt holes.

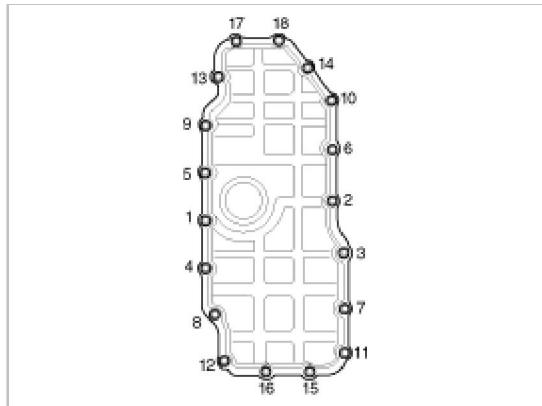
(3) Install the lower oil pan.



Uniformly tighten the bolts in several passes.

Tightening torque :

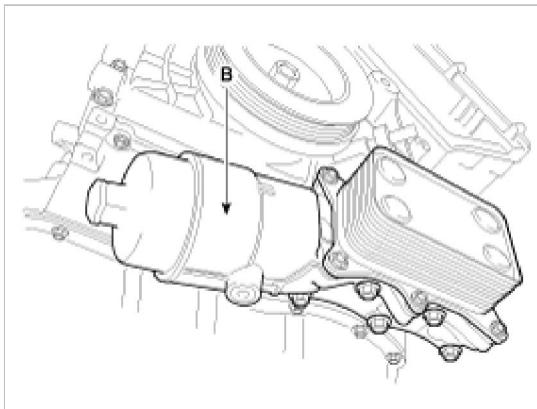
9.8 ~ 11.8Nm (1.0 ~ 1.2kgf.m, 7.2 ~ 8.7lb-ft)



4. Install the oil filter & cooler assembly (B).

Tightening torque :

19.6 ~ 23.5Nm (2.0 ~ 2.4kgf.m, 14.5 ~ 17.4lb-ft)



5. Install the sub frame. (Refer to SS group)

6. Refill the engine oil.

Engine Mechanical System > Lubrication System > Oil Pressure Switch > Repair procedures

Inspection

1. Check the continuity between the terminal and the body with an ohmmeter.
If there is no continuity, replace the oil pressure switch.