

LUBRCATION SYSTEM

1128-22/1128-42/1535-01/1535-03/1535-08/1535-30/
1535-31/1545-01/9210-01/

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LUBRCATION SYSTEM

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دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



LUBRCATION SYSTEM**1535-01****GENERAL INFORMATION****1. SPECIFICATION**

Description		Specification
Oil pump	Lubrication type	Gear pump, forced circulation
	Type	Internal gear
Oil filter	Type	Full flow/Paper element
Engine oil	Oil	Quality class: Ssangyong genuine engine oil (Approved by MB 229.51 SAE 5W30)
	Capacity	4.5 L
Oil injection nozzle	Type	Flange and bolt type

**CAUTION**

The engine oil filter element should be changed at the same time with the engine oil.

- Regularly check the engine oil level and add the engine oil if necessary.
- Remember to check the engine oil level and shorten the cycle to replace the engine oil under severe driving conditions.

Severe Driving Condition?

- Frequent stop-and-go traffic, extended idling, short driving distance below 6 km, driving distance below 16 km when the outside temperature remains below freezing
- Driving in a hilly or mountainous terrain, sandy, or dusty area
- High load driving such as trailer towing
- Taxi, patrol service or delivery service (extended idling and excessive driving with low speed)

Modification basis	
Application basis	
Affected VIN	

LUBRCATION SYSTEM

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2. MAINTENANCE

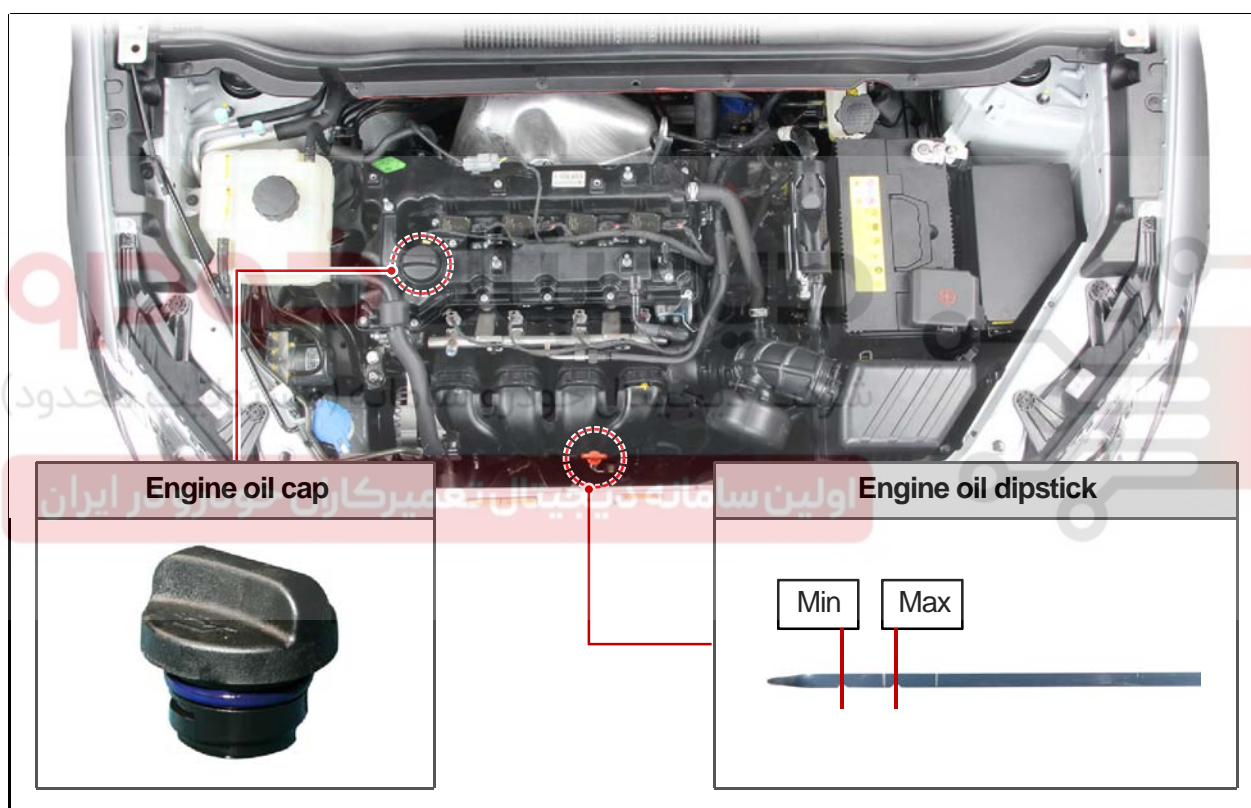
Park the vehicle on a level ground and apply the parking brake. Stop the engine and wait more than 5 minutes.

- Pull out the dipstick and wipe it with a clean cloth. Reinsert it all the way.
- Pull out it again and check the oil level.
- The oil level should be between the maximum (Max) mark and minimum (Min) mark on the oil dipstick. Oil should be replenished before the level goes below the minimum mark.



WARNING

Operating vehicle with insufficient amount of oil can damage the engine. Make sure the engine oil level is correct and add oil if necessary.



► Replenishment

If the level gets to the lower point, open the filler cap on top of the cylinder block and add the genuine oil without exceeding the level of the upper mark.

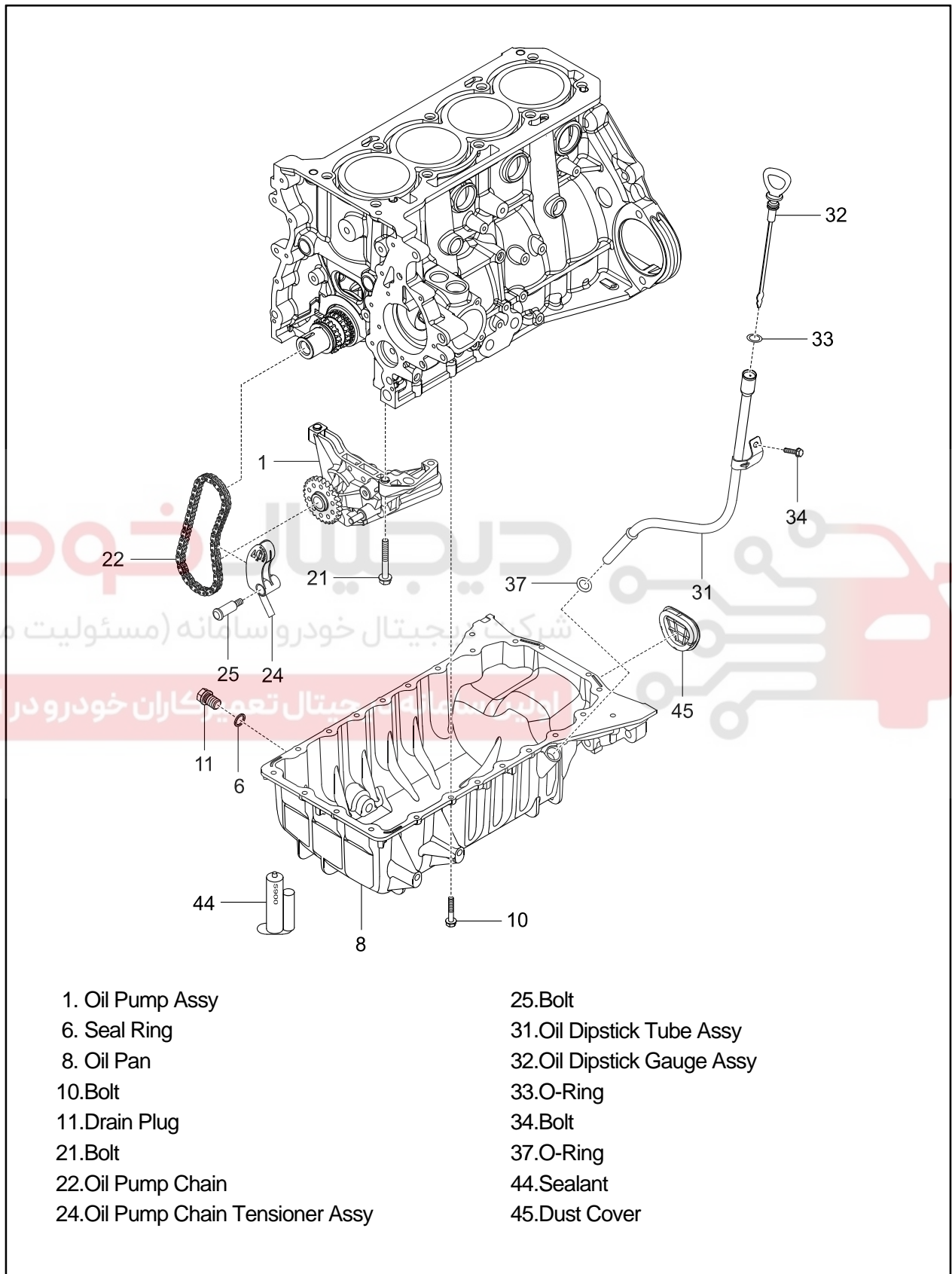
Recheck the oil level after 5 minutes.



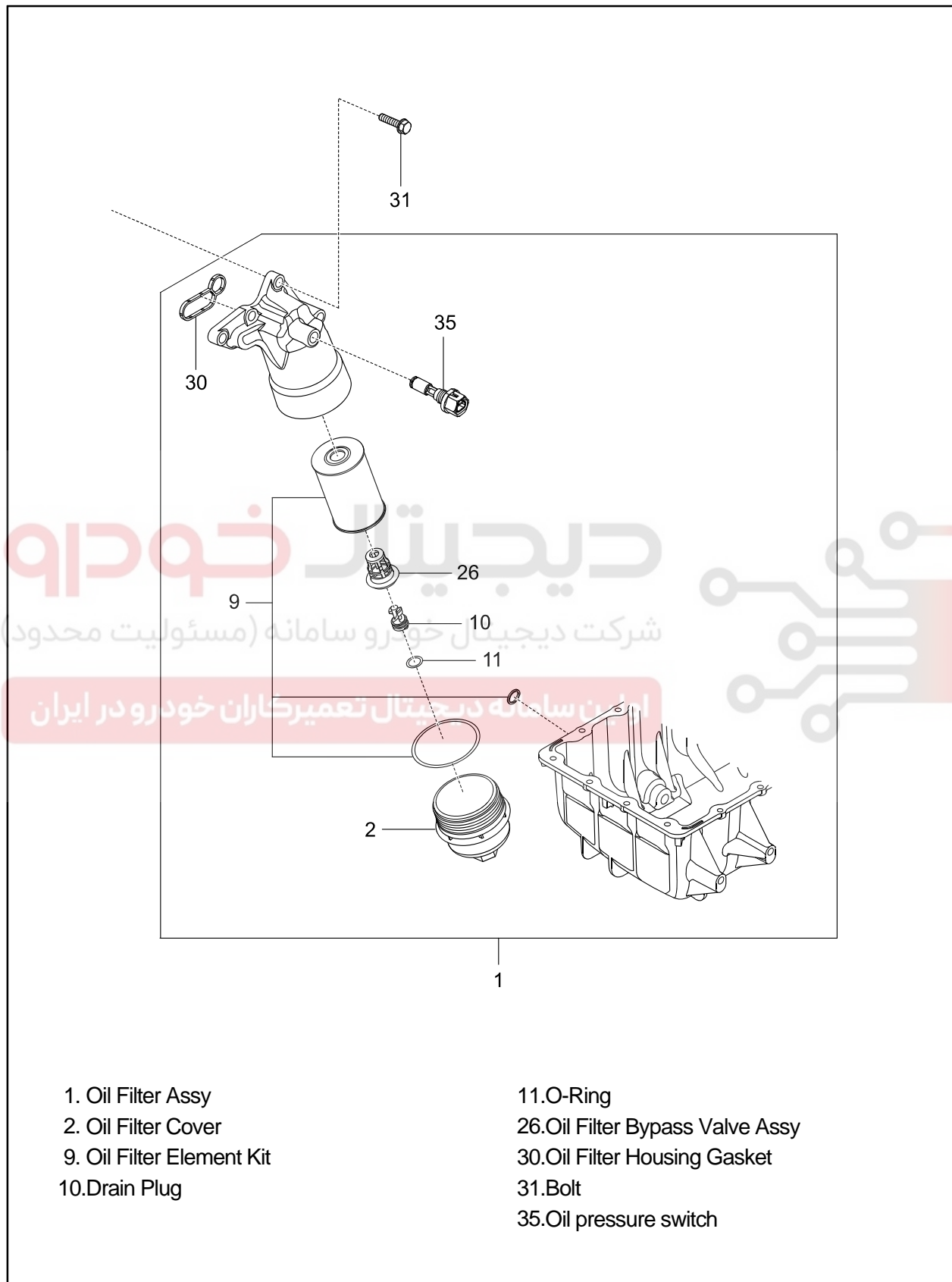
CAUTION

- Regularly check the engine oil level and add Ssangyong genuine engine oil if necessary.
- Clean the dipstick with clean cloth so that any foreign materials cannot get into the engine.
- The oil should not go above the upper mark on the dipstick.
- The engine oil may be consumed more if the engine is new.

3. LAYOUT



Modification basis	
Application basis	
Affected VIN	



Modification basis	
Application basis	
Affected VIN	

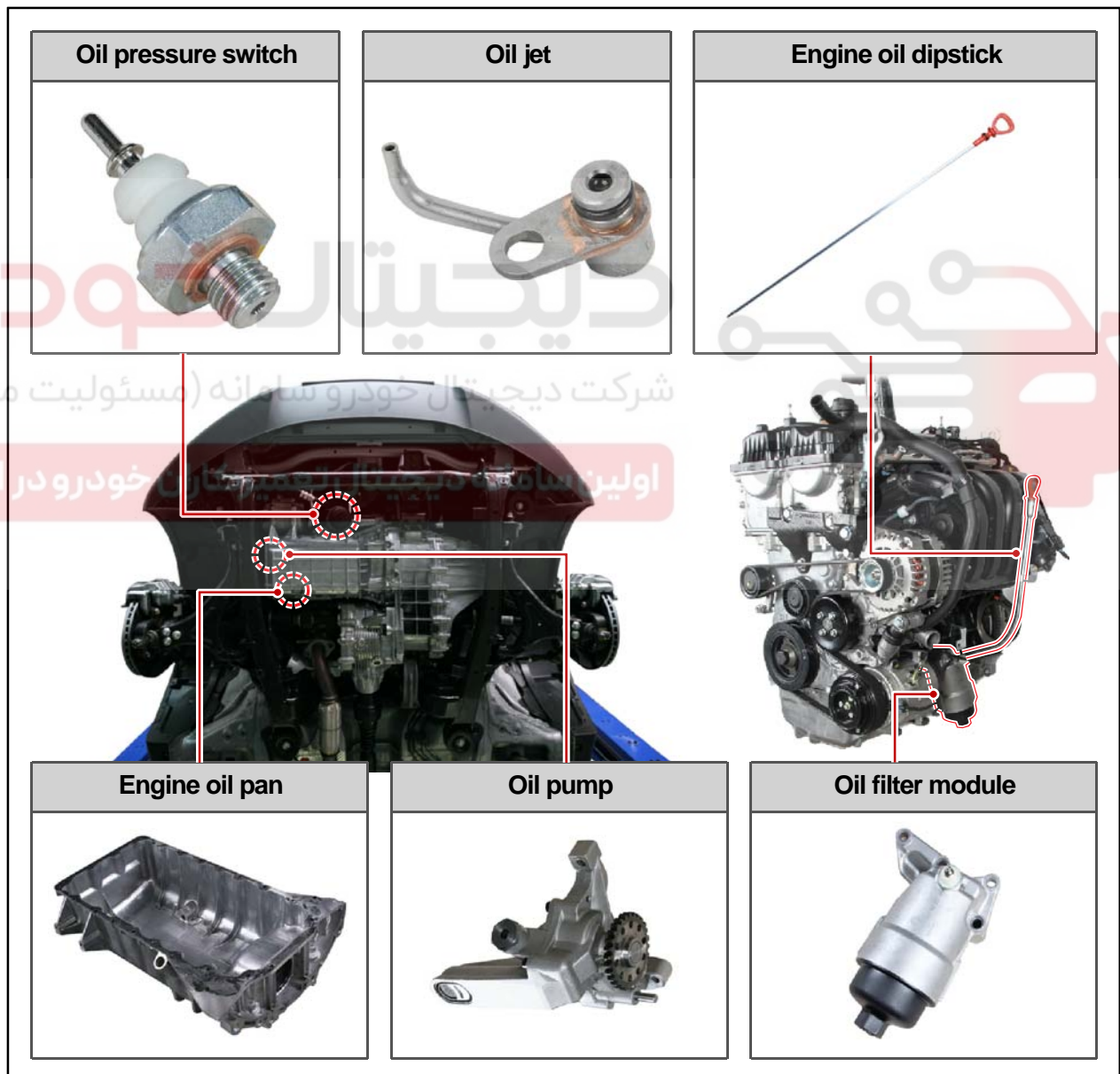
OVERVIEW AND OPERATING PROCESS

1. OVERVIEW

The lubrication system supplies oil to each lubrication section to prevent friction and wear and to remove heat from the friction part. As the engine runs, frictional heat is generated on each lubrication section. If this condition persists, the bearing can be burned and stuck.

In other words, it creates an oil film on each sliding surface to convert solid friction to liquid friction in order to minimize wear and prevent temperature increasing on the friction part.

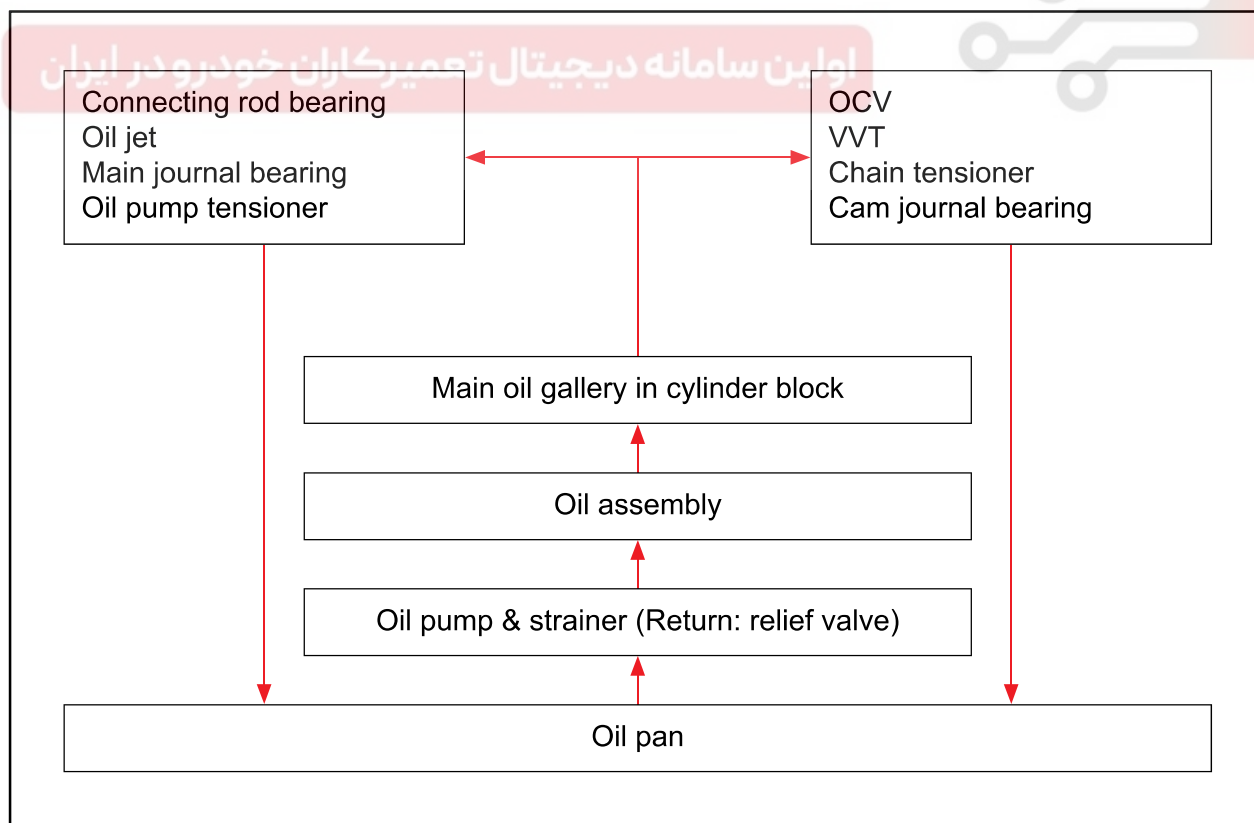
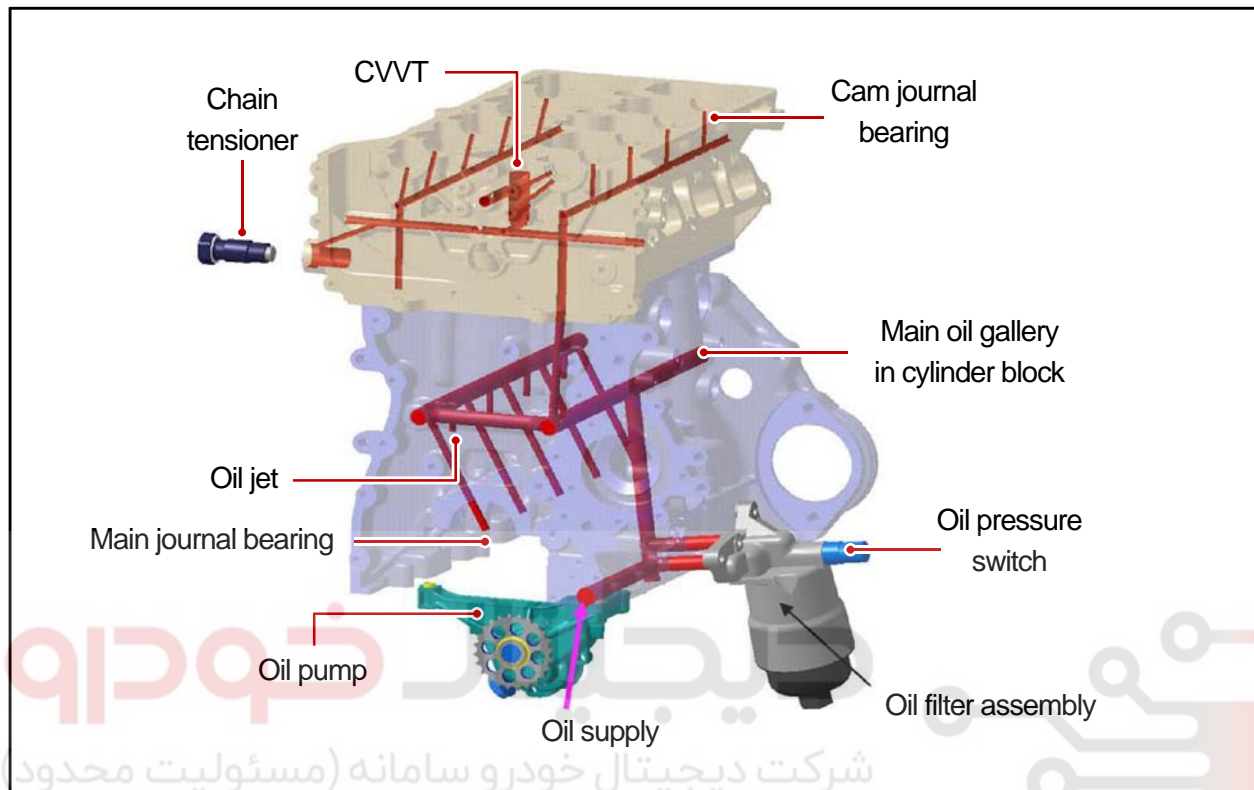
2. COMPONENTS



Modification basis	
Application basis	
Affected VIN	

3. OPERATING PROCESS

1) Operation Flow



CONFIGURATION AND FUNCTION

S.G.N. 9210-01 ENGINE OIL

1) Function of Engine Oil

Engine oil's major function is to lubricate and cool the parts inside of the engine, which enables engine to work properly.

2) Consumption of Engine Oil

The consumption of engine oil is depending on the viscosity and quality of the oil, and the driving habit. More oil may be required under the following conditions;

- When the Vehicle is New

A new engine usually consumes more oil because its pistons, piston ring and cylinder walls are not yet adjusted with an optimal condition.

Oil Consumption : Max. 0.5 Liter per 1,000 km Accordingly, it is necessary for the driver to check frequently the oil level and to replenish oil if needed. SYMC recommends that the oil level be checked every time you refuel the vehicle or you drive the long distance until the first 5,000 km.

3) Engine Care

Observe the followings to keep the engine in good condition:

- Check the engine oil level frequently under severe driving condition and add some if necessary. The change interval should be shortened as well.
- Do not run a new engine at high speed until its driving distance gets 1,000 km. Be extra careful when the engine is cold.
- After installing a new engine, do not tow another vehicle or a trailer until its driving distance gets 1,000 km.

Description	Service Interval
Engine oil and filter	Initial change at 10,000 km of driving, then change at every 15,000 km of driving or 12 months

CAUTION

- Shorten the service interval under severe condition.
- Observe the service interval (driving distance or months, whichever comes first).

Modification basis	
Application basis	
Affected VIN	

S.G.N.

1545-01 OIL FILTER ASSEMBLY**1) Overview**

The oil filter removes the solid foreign materials (combustion residue, dust, metal particles, etc.) from the engine oil and maintains lubrication capability of the oil until its service life ends.

**NOTE**

The filter element should be replaced at the same time when the oil is changed.

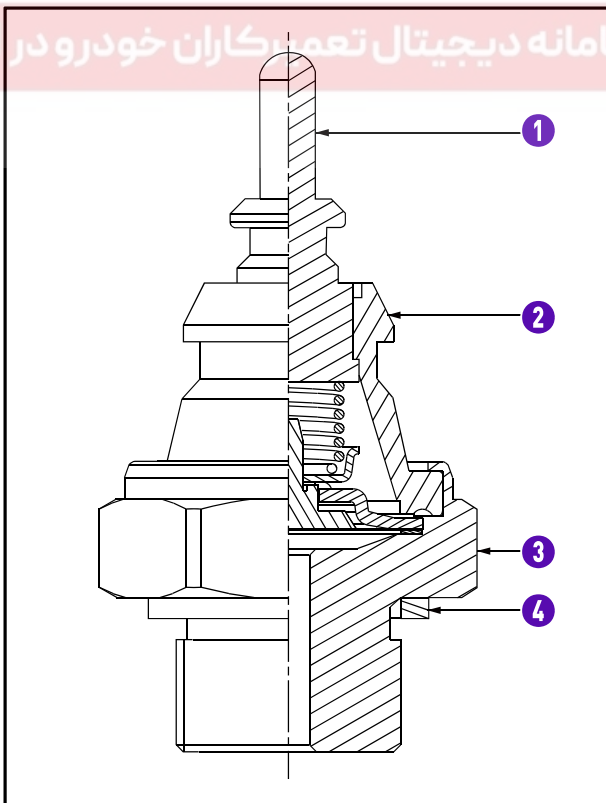
**Oil filter assembly****Components**

NO.	Name
1	Oil filter housing
2	Oil filter element
3	Oil filter cap
4	Oil filter housing gasket
5	Oil filter pressure switch
6	Oil filter housing mounting bolt
7	O-ring in oil filter cap

S.G.N.

1545-35 OIL PRESSURE SWITCH**1) Overview**

If the oil pressure in engine drops below 0.5 bar during engine running, the engine oil warning lamp in the instrument cluster comes on.



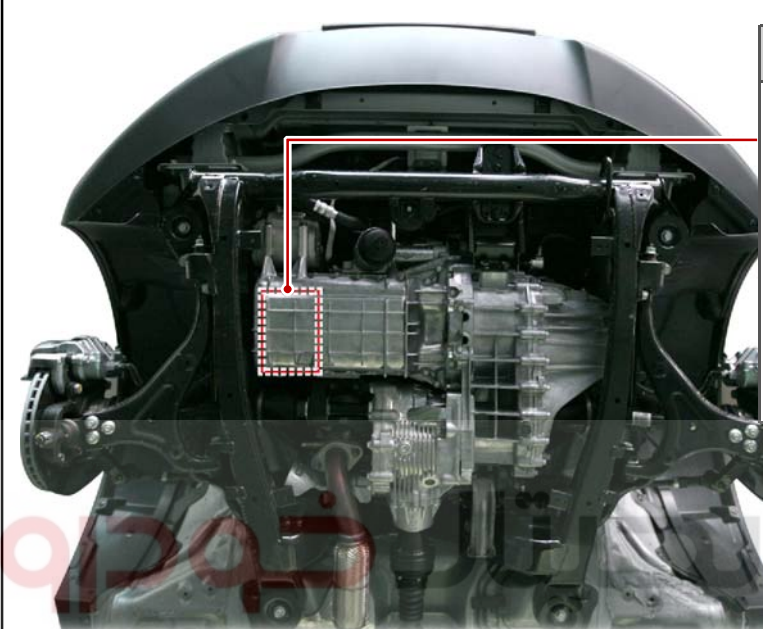
1. Adapter
2. Base
3. Seal washer
4. Body

Modification basis	
Application basis	
Affected VIN	


S.G.N.

1535-01 OIL PUMP ASSEMBLY**1) Overview**


The oil pump circulates the engine oil to lubricate the components such as oil filter, bearings, piston and valve. It uses the internal gear.



Oil pump assembly



Components



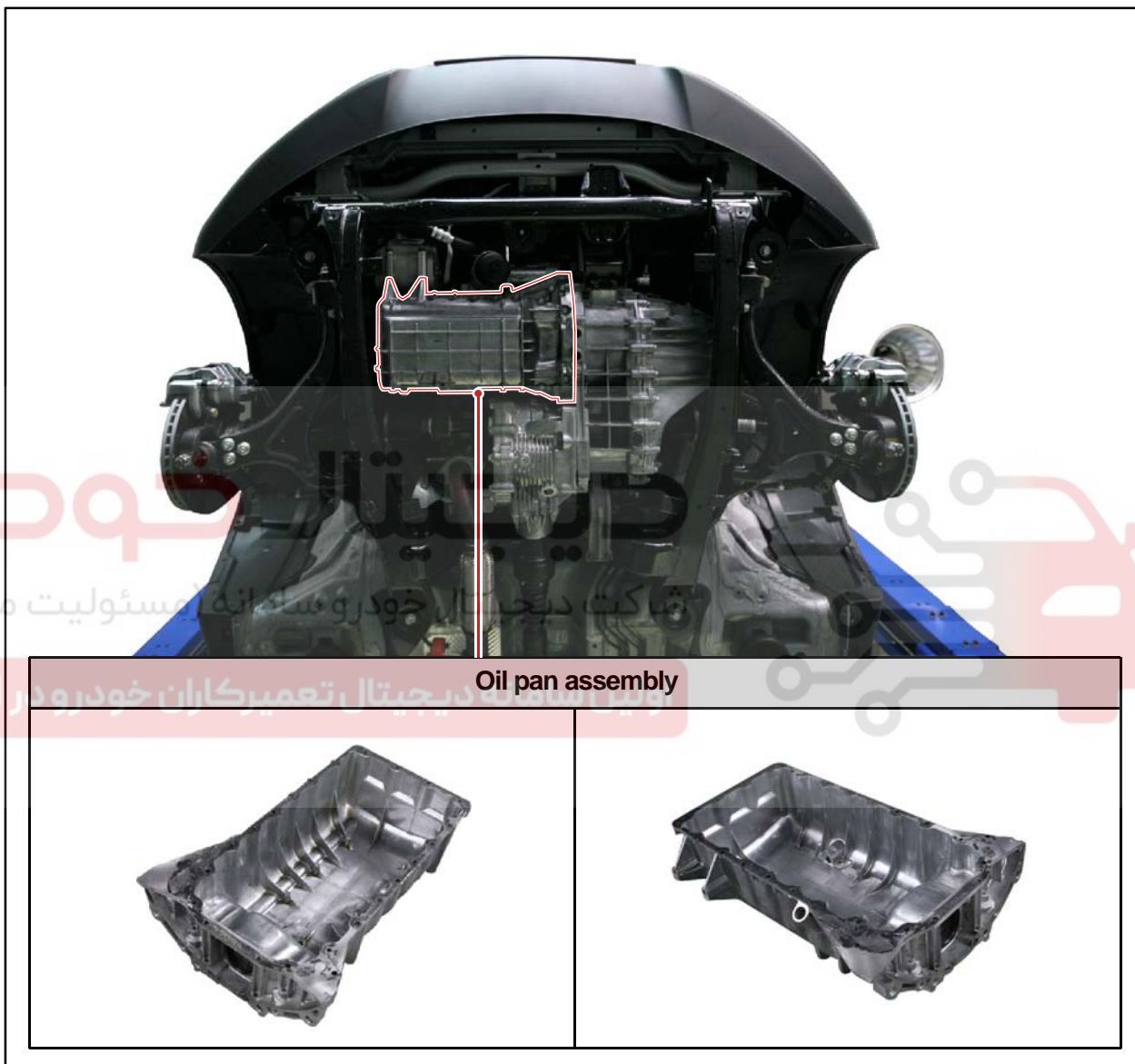
NO.	Name
1	Oil pump housing
2	Oil pump gear
3	Internal gear
4	Oil pump strainer
5	Piston
6	Spring
7	Lock nut

Description	Specification
Relief pressure	4.8bar \pm 0.3bar
Capacity	15.97 cc/rev

S.G.N.

1535-08 OIL PAN ASSEMBLY**1) Overview**

The oil pan stores the engine oil which is circulated through the engine. The oil pan contains the air conditioner compressor, oil dipstick gauge tube, and dust cover.



Modification basis	
Application basis	
Affected VIN	

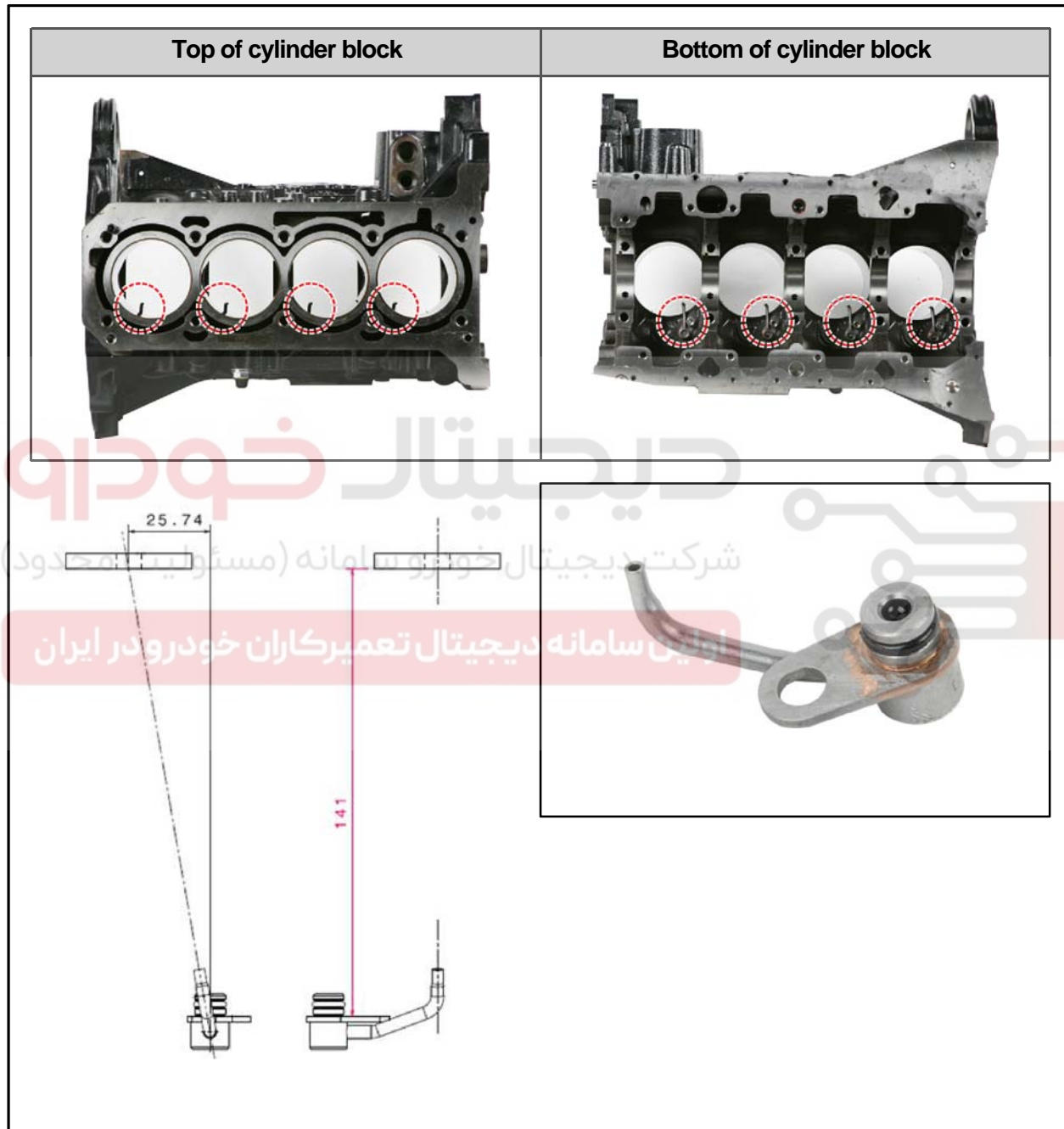
LUBRCATION SYSTEM

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1128-22 OIL INJECTION NOZZLE**1) Overview**

The injection nozzle is pressed into the inner bottom of the cylinder block, supplies the oil into the piston, and cools the piston.



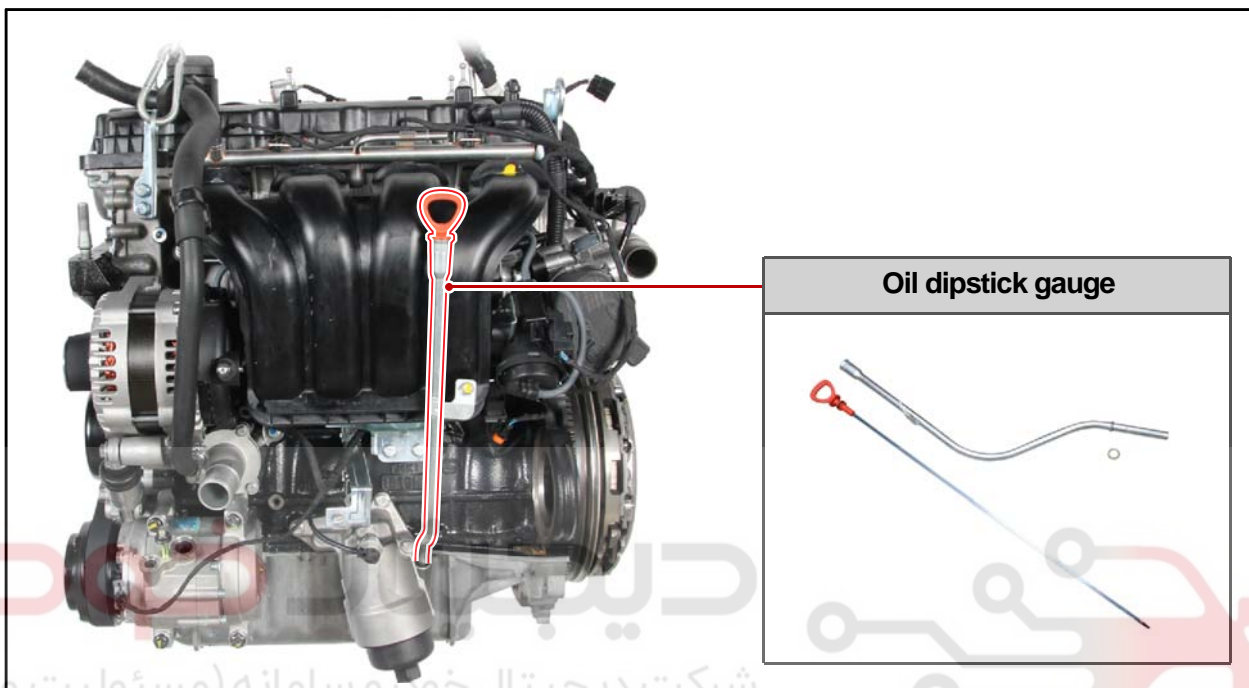
Modification basis	
Application basis	
Affected VIN	

REMOVAL AND INSTALLATION

S.G.N.

1535-31 OIL DIPSTICK GAUGE

Preceding work - Disconnect the negative cable from the battery.



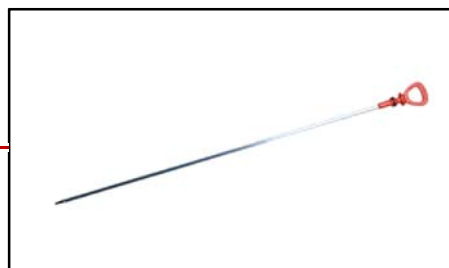
1. Remove the start motor.

**NOTE**

Refer to Chapter "Starting System".



2. Pull out the oil dipstick gauge.



Modification basis	
Application basis	
Affected VIN	

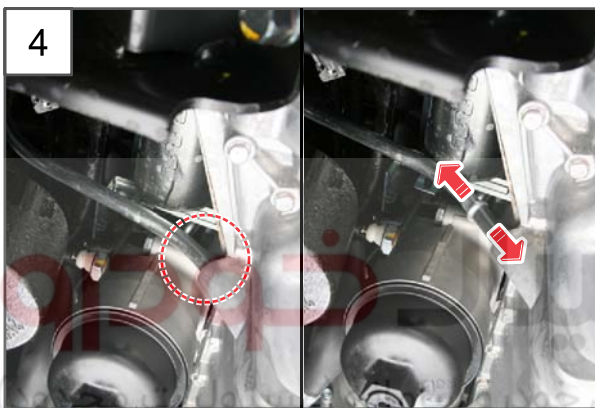
LUBRCATION SYSTEM

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3. Unscrew the bolt (10 mm) from the oil dipstick gauge tube.

Tightening torque $10.0 \pm 1.0\text{Nm}$

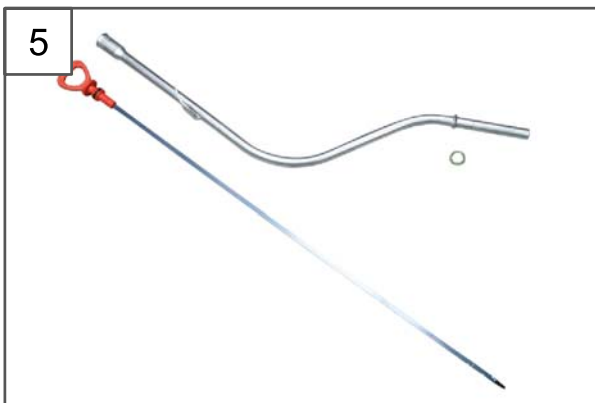


4. Remove the oil dipstick gauge tube from the oil pan.



CAUTION

Replace the O-ring with new one.



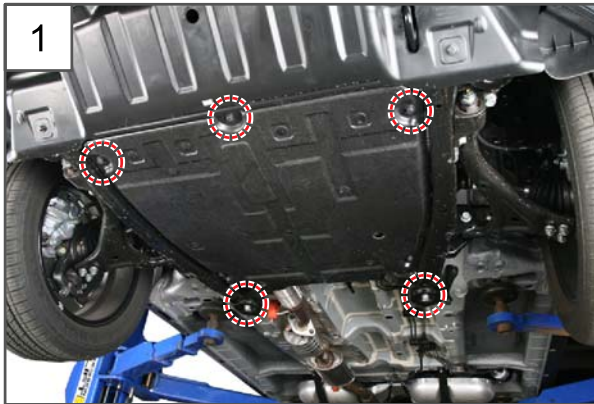
5. Install the oil dipstick gauge in the reverse order of removal.

Modification basis	
Application basis	
Affected VIN	

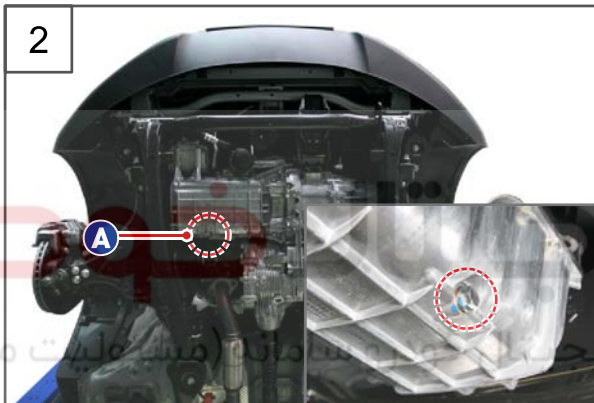
S.G.N.

9210-01 ENGINE OIL AND OIL FILTER

► Draining the engine oil



1. Unscrew five bolts (12 mm) and remove the undercover.



2. Unscrew the oil drain plug (A).

Tightening torque $30.0 \pm 3.0\text{Nm}$

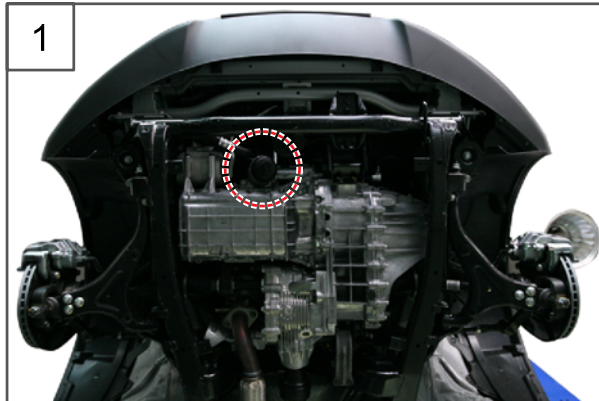


3. Drain the engine oil completely and retighten the oil drain plug to the specified tightening torque.

ENGINE
GENERALENGINE
ASSEMBLYINTAKE
SYSTEMFUEL
SYSTEMEXHAUST
SYSTEMIGNITION
SYSTEMLUBRICAT
IONCOOLING
SYSTEMCHARGE
SYSTEMSTARTIN
GCRUISE
CONTROENGINE
CONTRO

Modification basis	
Application basis	
Affected VIN	

► Removing the oil filter

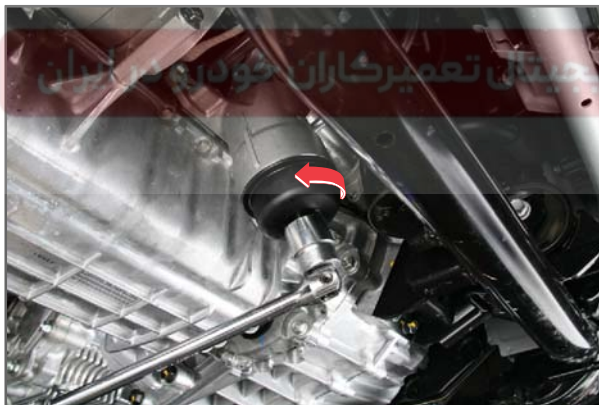


1. Unscrew (counterclockwise) the oil filter cap.

Tightening torque $30.0 \pm 3.0\text{Nm}$



2. Unscrew the drain plug in oil filter cap and drain the oil from the oil filter assembly.



3. Remove the oil filter cap by turning it counterclockwise.



4. Remove the oil filter assembly.

5. Install the oil filter assembly in the reverse order of removal.

Modification basis	
Application basis	
Affected VIN	

Cautions when installing

**NOTE**

Replace the O-ring (A) in filter cap with new one when replacing the oil filter element.

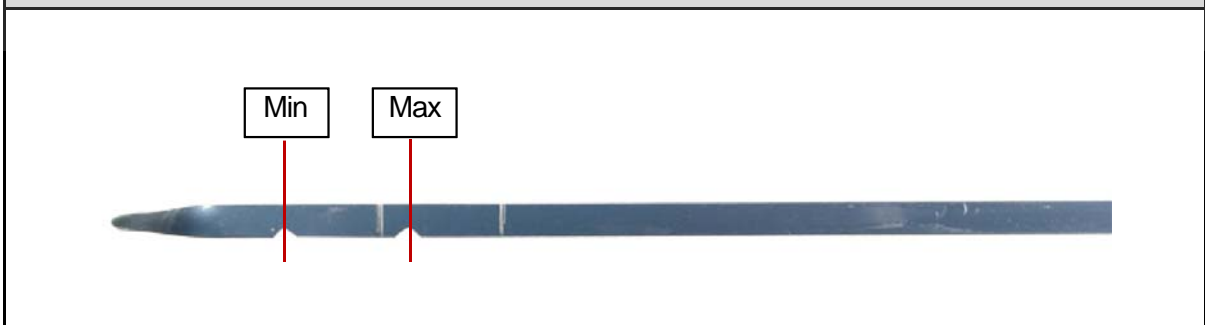
**CAUTION**

Apply the engine oil on the O-ring (A) and temporarily tighten the oil filter cap by hands before tightening it completely with the installer.

**CAUTION**

- Tighten the plug to the specified torque. Otherwise, there is a risk of oil leakage.
- Replace the washer on the drain plug with a new one.
- Add the genuine oil through the oil filler.
- Avoid adding the oil excessively, because it affects the engine performance.
- Close the oil filler cap after topping up the oil, then start the engine.
- Switch off the engine, check the oil level. Add the oil if necessary. Also, check for any leaks.

The oil level should be between the Min. and Max. marks on the oil dipstick.



Modification basis	
Application basis	
Affected VIN	

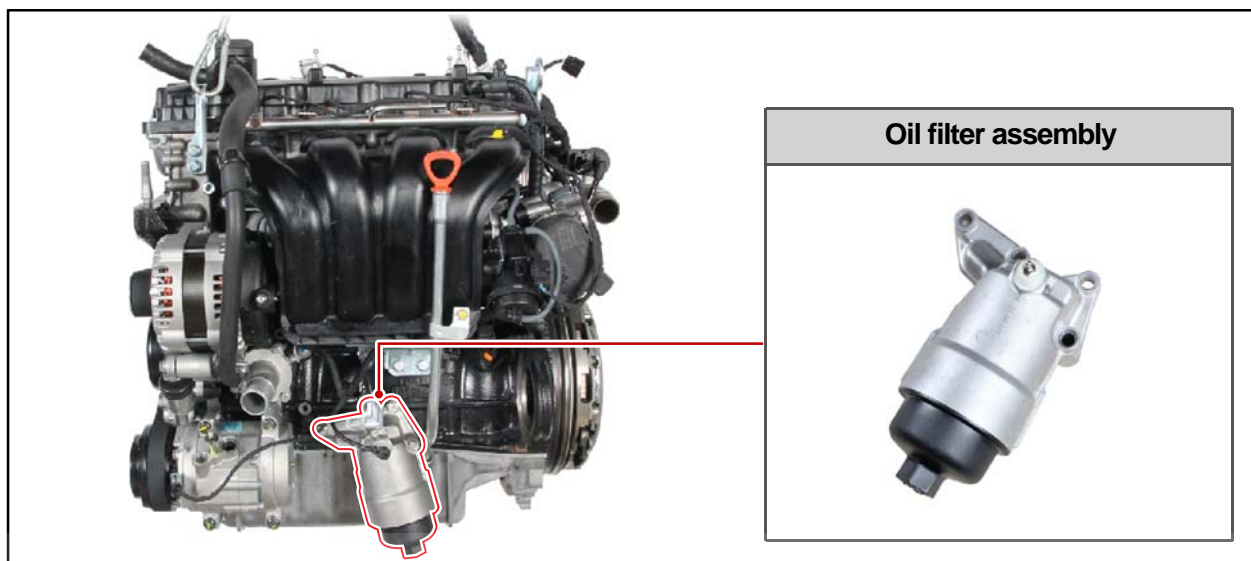
S.G.N.

1545-01

OIL FILTER AND OIL FILTER HOUSING

Preceding work

- Disconnect the negative cable from the battery.



1. Unscrew five bolts (12 mm) and remove the undercover.



2. Unscrew the oil drain plug (A).

Tightening torque $30.0 \pm 3.0\text{m}$



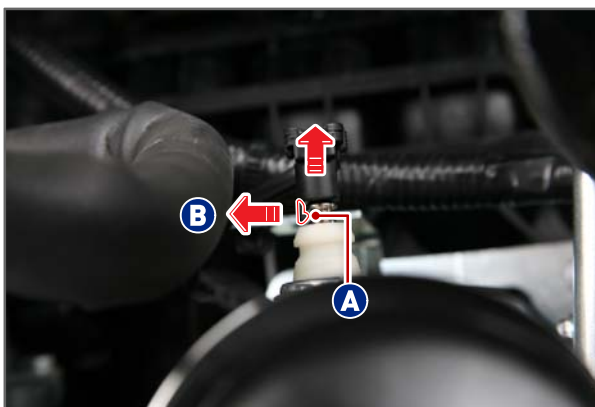
Modification basis	
Application basis	
Affected VIN	



3. Unscrew the drain plug in oil filter cap and drain the oil from the oil filter assembly.

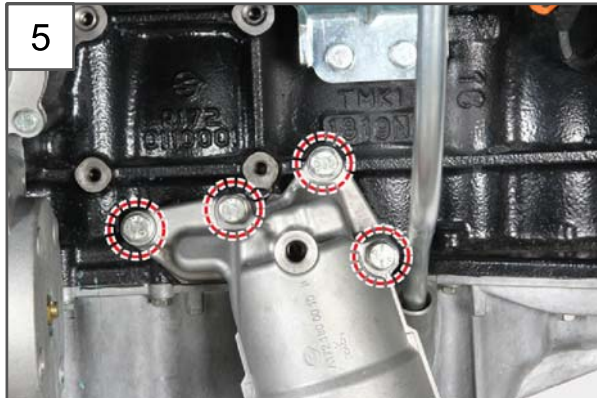


4. Lift up the vehicle and disconnect the oil pressure switch connector.

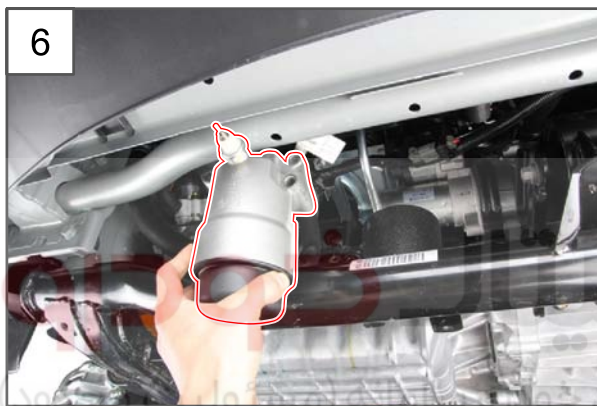


- Push the position (A) of oil pressure switch to direction (B).
- Oil pressure switch connector (A) part disconnect the connector in the direction of push (B) stirred.

Modification basis	
Application basis	
Affected VIN	



5. Unscrew four bolts (13 mm) from the oil filter assembly.



6. Remove the oil filter assembly.



7. Remove the gasket from the oil filter assembly.

CAUTION
Replace the gasket with new one.



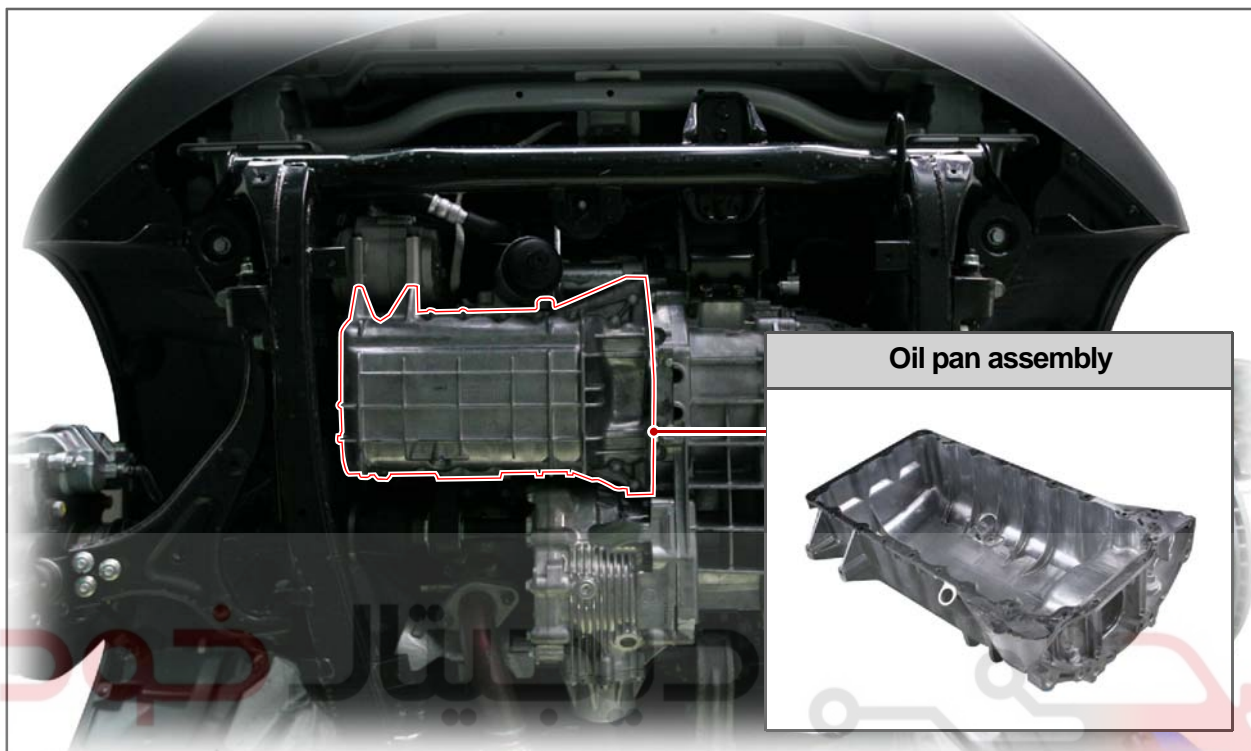
8. Install the oil filter assembly in the reverse order of removal.

S.G.N.

1535-08 OIL PAN

Preceding work

- Drain the engine oil completely.



1. Pull out the oil dipstick gauge.



2. Unscrew the oil dipstick tube mounting bolt.

Tightening torque $10.0 \pm 1.0\text{Nm}$

Modification basis	
Application basis	
Affected VIN	

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3. Unscrew the oil drain plug and drain the engine oil completely.

Tightening torque $30 \pm 0.3\text{Nm}$



4. Unscrew the lower bolt (A) from the air conditioner compressor.



NOTE

To prevent the interference with A/C pipe, loosen the lower left bolt.



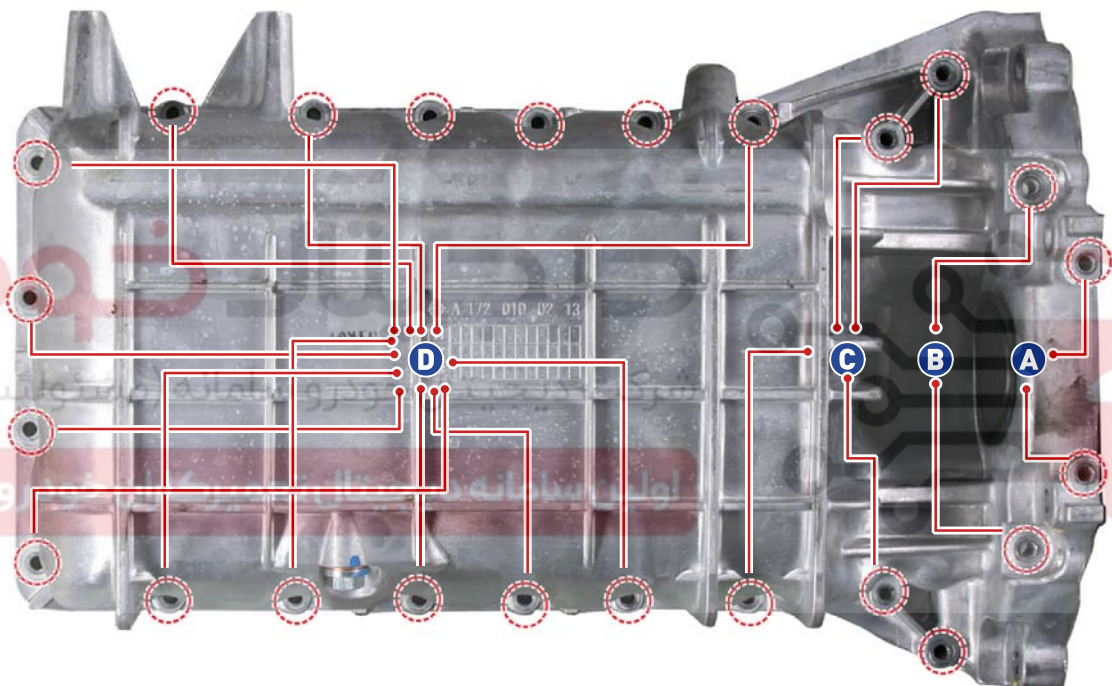
5. Unscrew four bolts (14 mm) on the oil pan to transaxle.

Modification basis	
Application basis	
Affected VIN	



6. Unscrew the oil pan bolts.

Tightening torque $10.0 \pm 1.0\text{Nm}$



⚠ CAUTION

To prevent the oil pan from damaging and distorting, unscrew the bolts slowly in two or more steps.

- Unscrew the bolts starting from outside in diagonal sequence.
- Tighten the bolts starting from inside in diagonal sequence.

		Tightening torque
A	M6*1.0*105 2EA	$10.0 \pm 1.0\text{Nm}$
B	M6*1.0*85 2EA	$10.0 \pm 1.0\text{Nm}$
C	M6*1.0*35 4EA	$10.0 \pm 1.0\text{Nm}$
D	M6*1.0*20 16EA	$10.0 \pm 1.0\text{Nm}$

Modification basis	
Application basis	
Affected VIN	



7. Separate the oil dipstick gauge tube from the oil pan.



8. Pry off the oil pan with a hand remover starting from the point (A) above oil drain plug.



9. Remove the oil pan assembly.

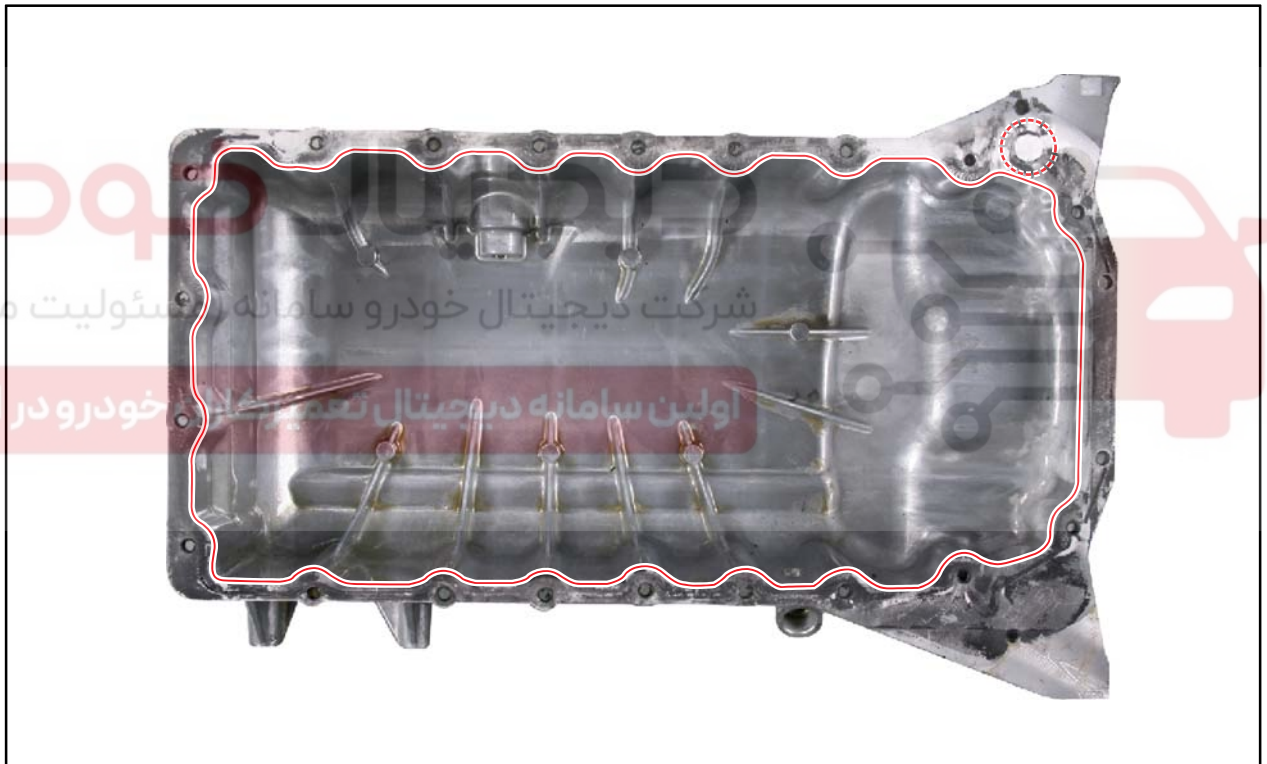
Modification basis	
Application basis	
Affected VIN	

10



10. Install the oil pan in the reverse order of removal.

► Location of sealant



CAUTION

Make sure not to spill out the engine oil from the oil pan.

- Wash out the oil pan to remove the foreign material.
- Evenly apply the specified sealant (661 989 56 20 (Loctite_LT 5900) or 661 989 57 20 (DREI BOND_DB 2210)) on the oil pan.
- Tighten the bolts to the specified tightening torque.

Modification basis	
Application basis	
Affected VIN	

07-28

1535-01

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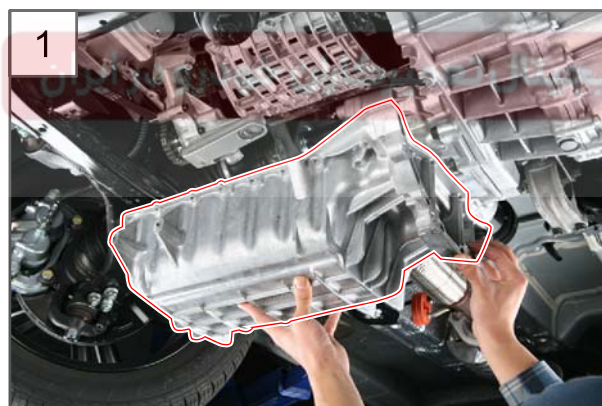
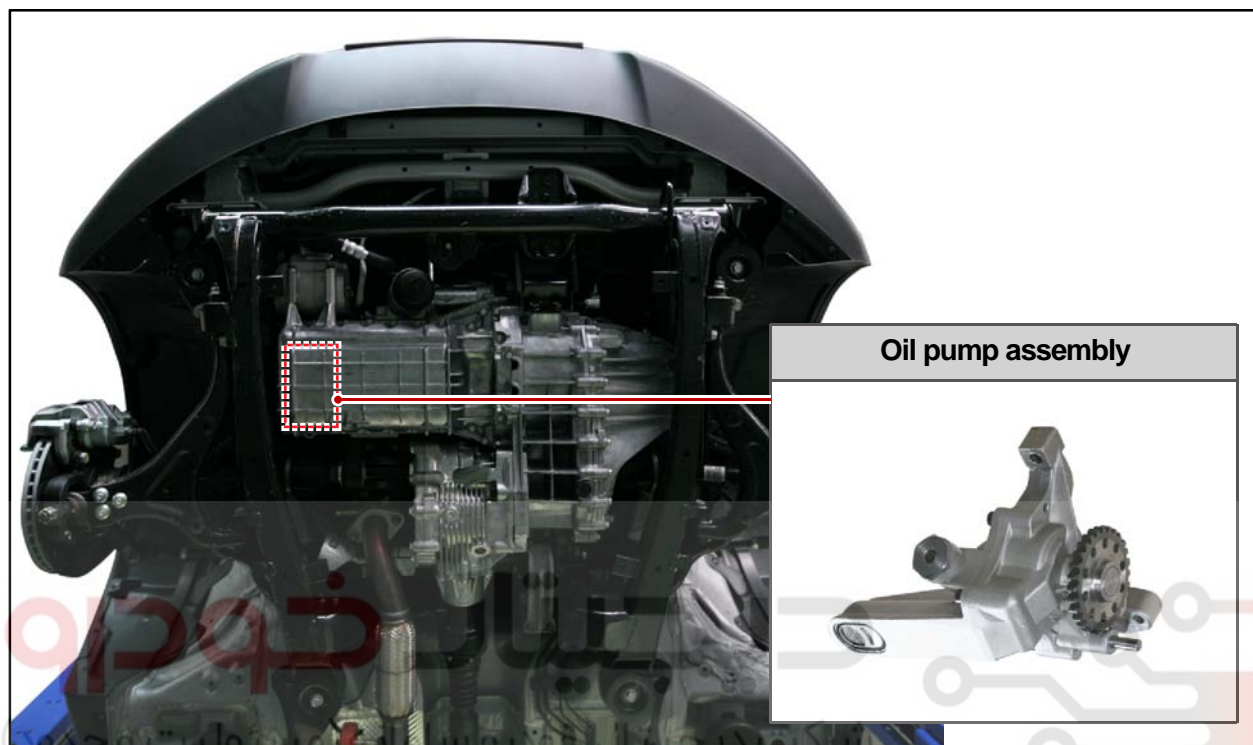
S.G.N.

1535-01

OIL PUMP ASSEMBLY

Preceding work

- Drain the engine oil completely.
- Remove the front right tire.



1. Remove the oil pan assembly.

**NOTE**

Refer to chapter "Oil pan".



2. Remove the crankshaft main cover.

LUBRCATION SYSTEM

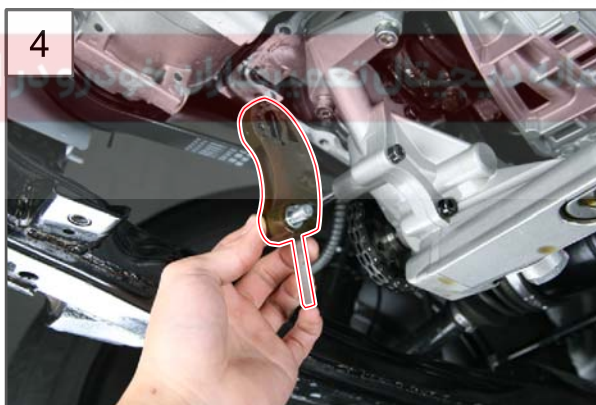
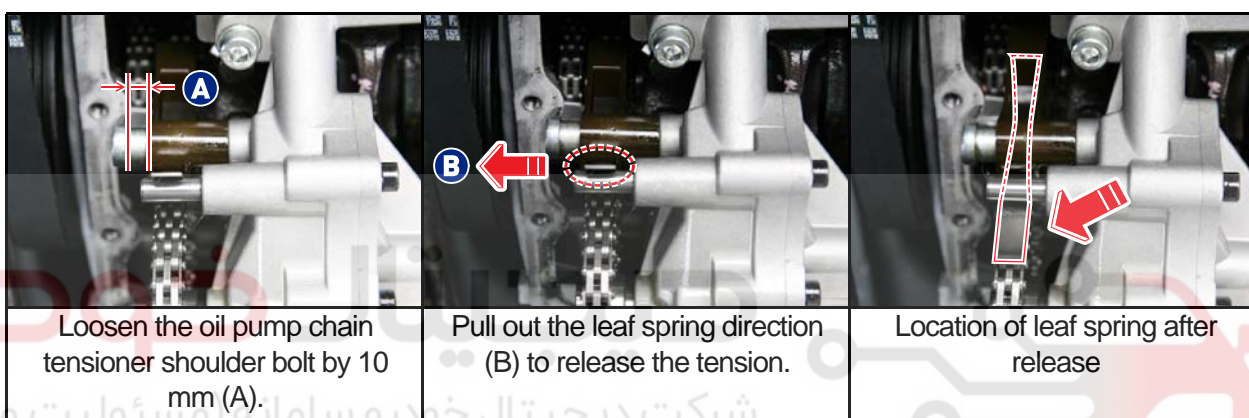
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Modification basis	
Application basis	
Affected VIN	

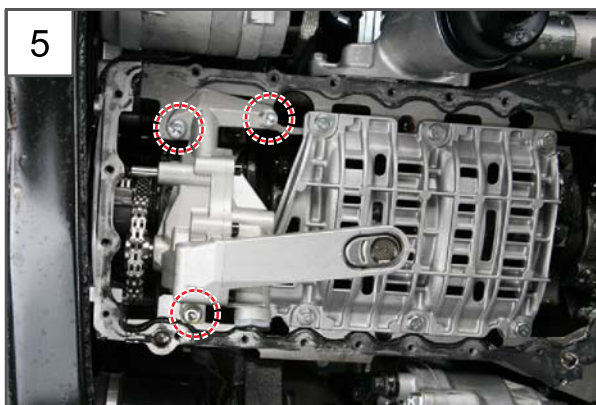


3. Loosen the oil pump tensioner adjust bolt by 10 mm to release the tension.

Tightening torque $10.0 \pm 1.0\text{Nm}$



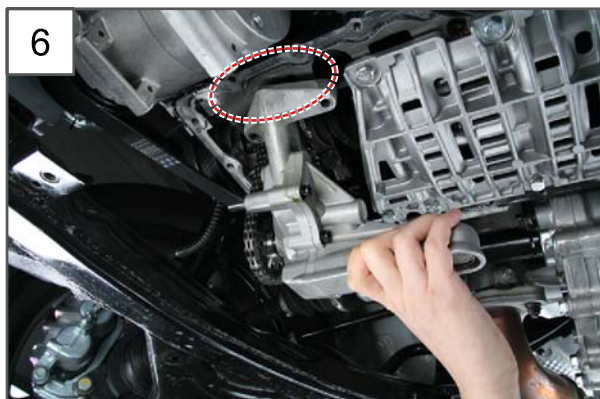
4. Remove the oil pump chain tensioner.



5. Unscrew three bolts (6 mm) from the oil pump assembly.

Tightening torque $25.0 \pm 2.5\text{Nm}$

Modification basis	
Application basis	
Affected VIN	

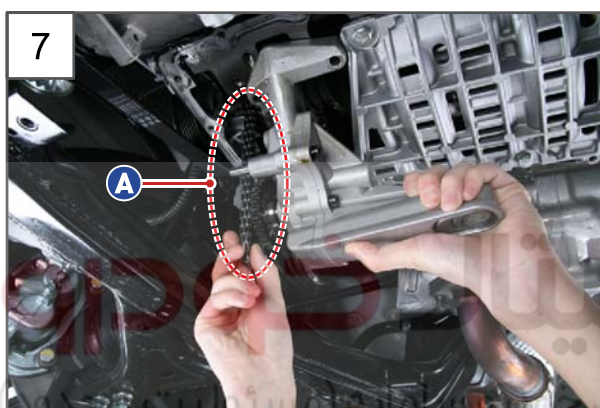


6. Separate the oil pump assembly.



CAUTION

Make sure not to spill out the engine oil through the oil supply lines.



7. Separate the oil pump assembly from the chain (A).



8. Remove the oil pump assembly.

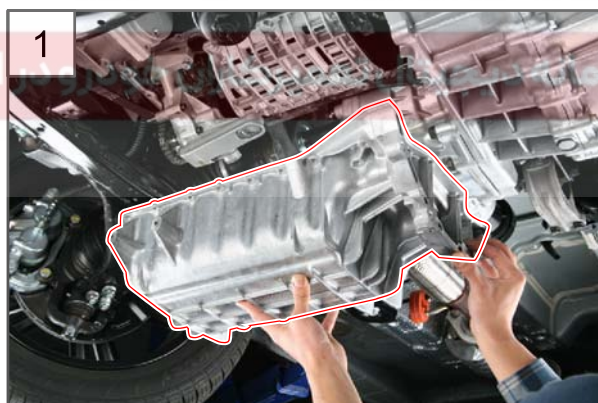
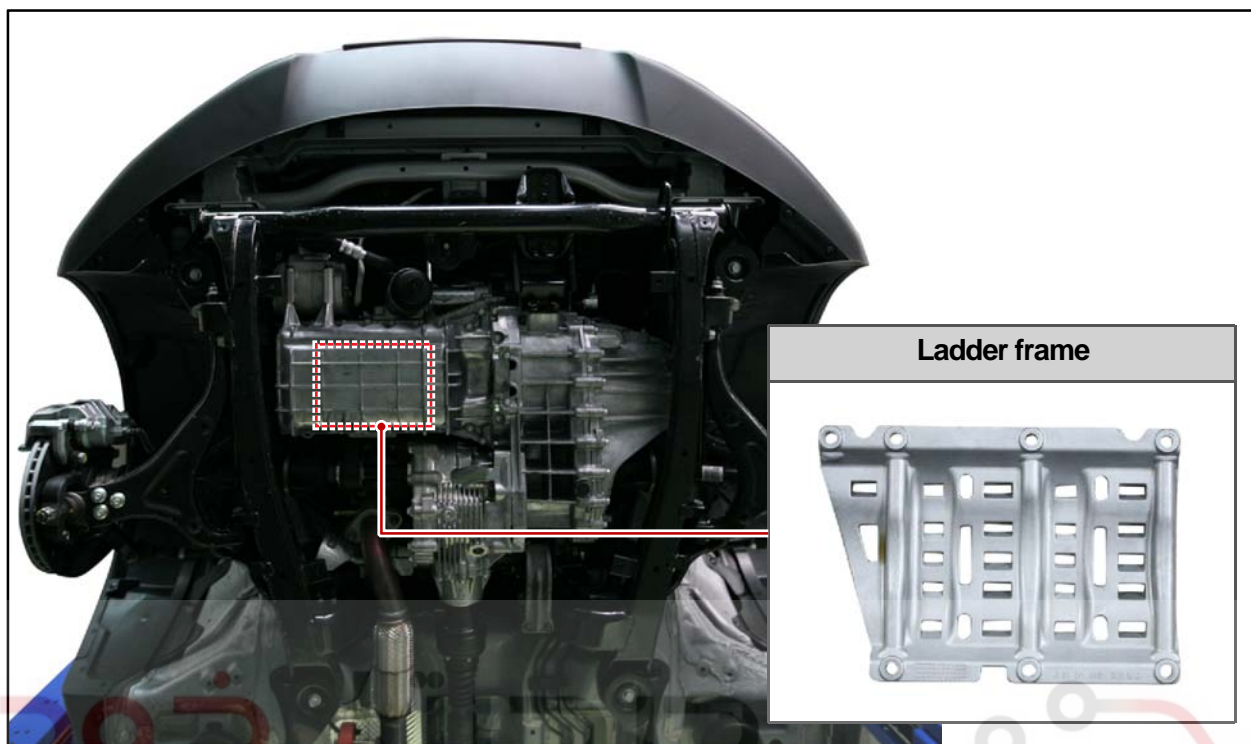


9. Install the oil pump assembly in the reverse order of removal.

Modification basis	
Application basis	
Affected VIN	

S.G.N.

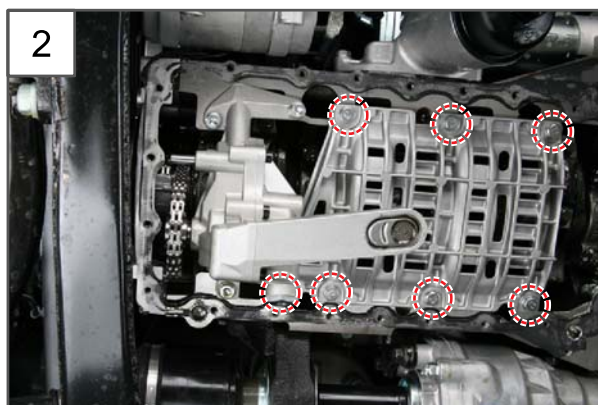
1128-42 LADDER FRAME



1. Remove the oil pan assembly.

**NOTE**

Refer to chapter "Oil pan".



2. Unscrew seven bolts (12 mm) from the ladder frame.

Tightening torque $21.0 \pm 2.0\text{Nm}$

Modification basis	
Application basis	
Affected VIN	



3. Remove the ladder frame.



4. Install the ladder frame in the reverse order of removal.



دیجیتال خودرو سامانه (مسئولیت محدود)
شرکت دیجیتال خودرو سامانه

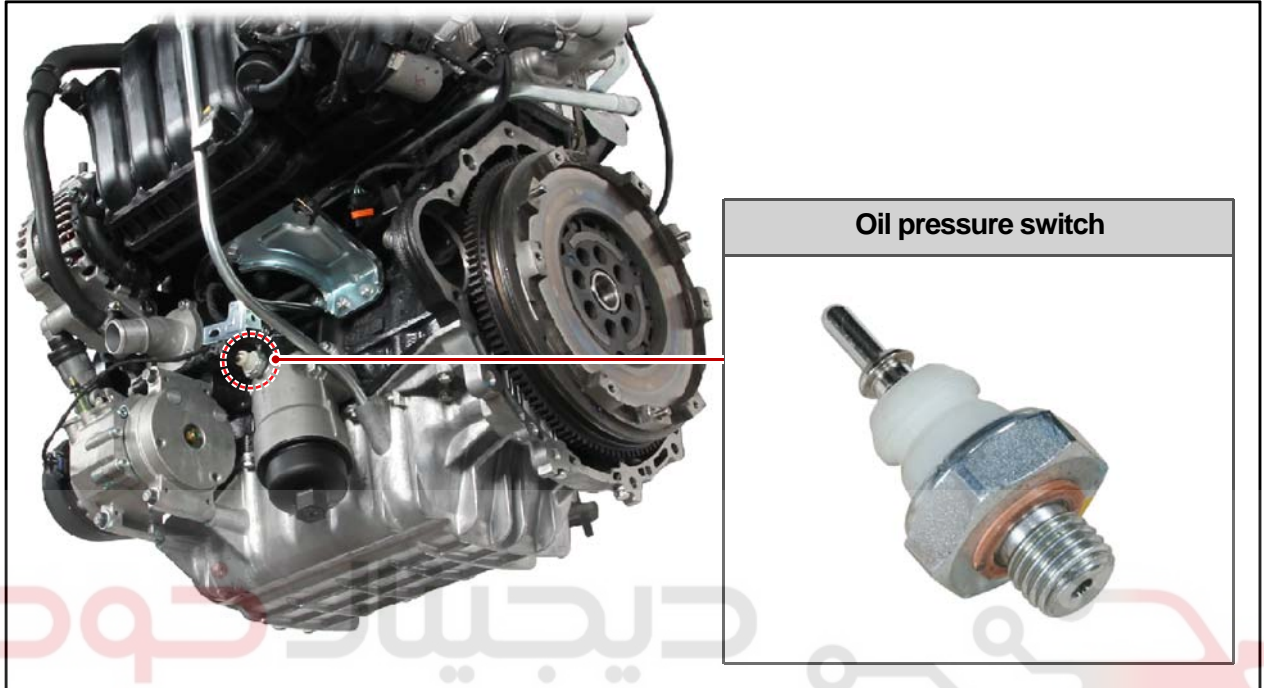
اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

Modification basis	
Application basis	
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S.G.N.

1545-35 OIL PRESSURE SENSOR**Preceding work**

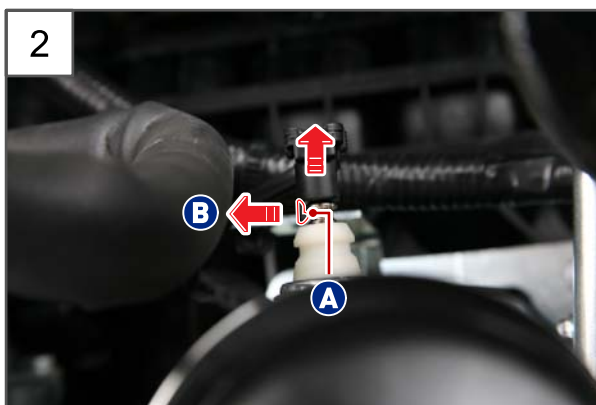
- Disconnect the negative cable from the battery.
- Remove the front undercover.



شرکت دیجیتال خودرو (مسئولیت محدود)



1. Lift up the vehicle and disconnect the oil pressure switch connector.



- Push the position (A) of oil pressure switch to direction (B).
- Oil pressure switch connector (A) part disconnect the connetor in the direction of push (B) stirred.

Modification basis	
Application basis	
Affected VIN	

LUBRCATION SYSTEM

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2. Unscrew the oil pressure switch with a spanner (27 mm).

Tightening torque Max.50Nm



3. Remove the oil pressure switch.



CAUTION

Make sure not to spill out the engine oil through the oil supply lines.



4. Install the oil pressure switch in the reverse order of removal.



CAUTION

Replace the copper washer with new one.