INTAKE SYSTEM

1740-00/1740-01/1740-07/2313-01/2313-03/2313-14/

GENERAL INFORMATION

OVERVIEW AND OPERATING PROCESS

CONFIGURATION

REMOVAL AND INSTALLATION

INTAKE SYSTEM 1740-01

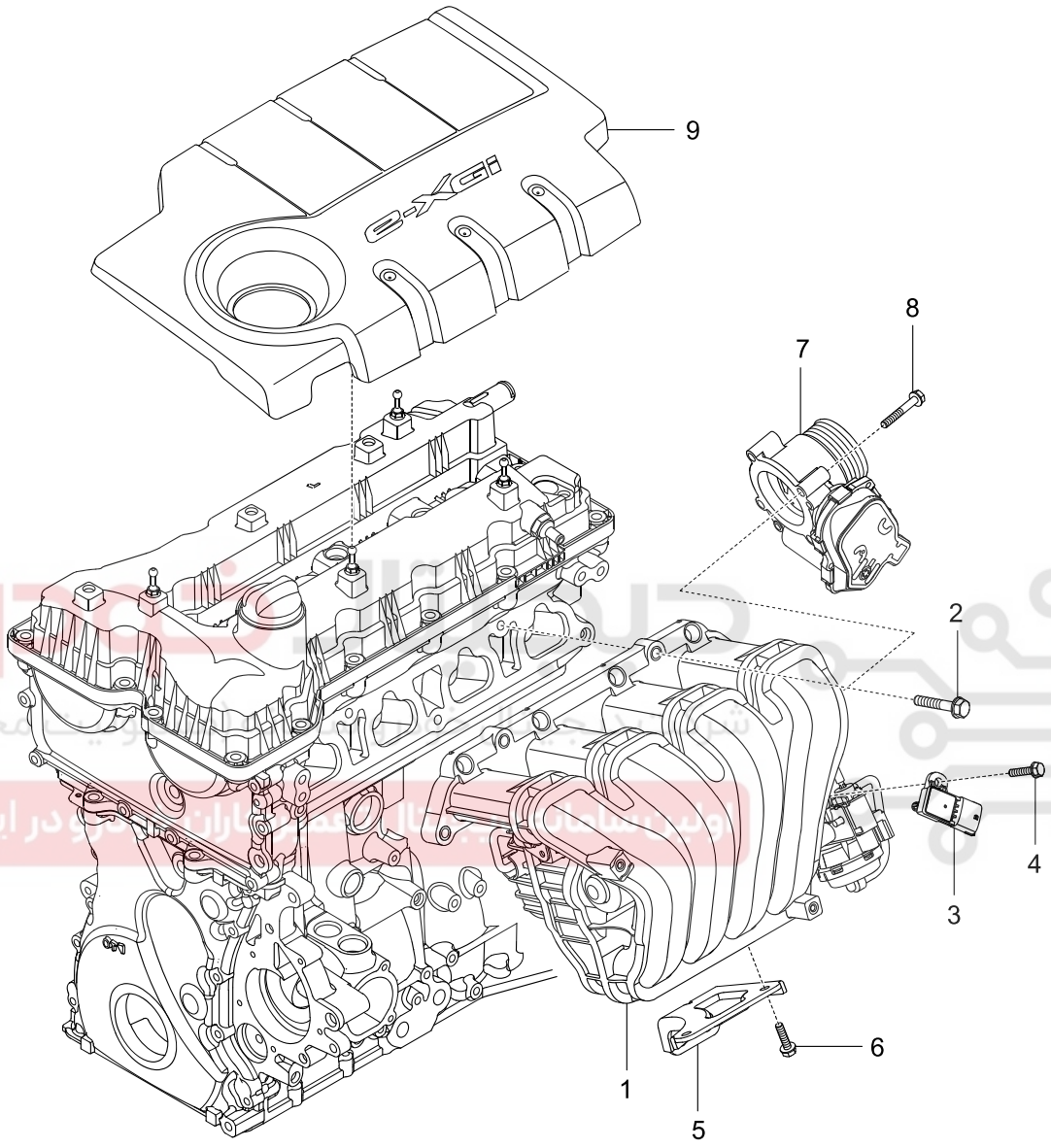
GENERAL INFORMATION

1. SPECIFICATION

Unit	Description	Specification
Air cleaner element	Filter type	Dry, filter element
	Filtering area	0.225 m²
	Service interval	Clean every 7,500 km
		Change every 15,000 km
Air cleaner assembly	Weight	1.45 kg
	Operating temperature	25℃
	Capacity	7L

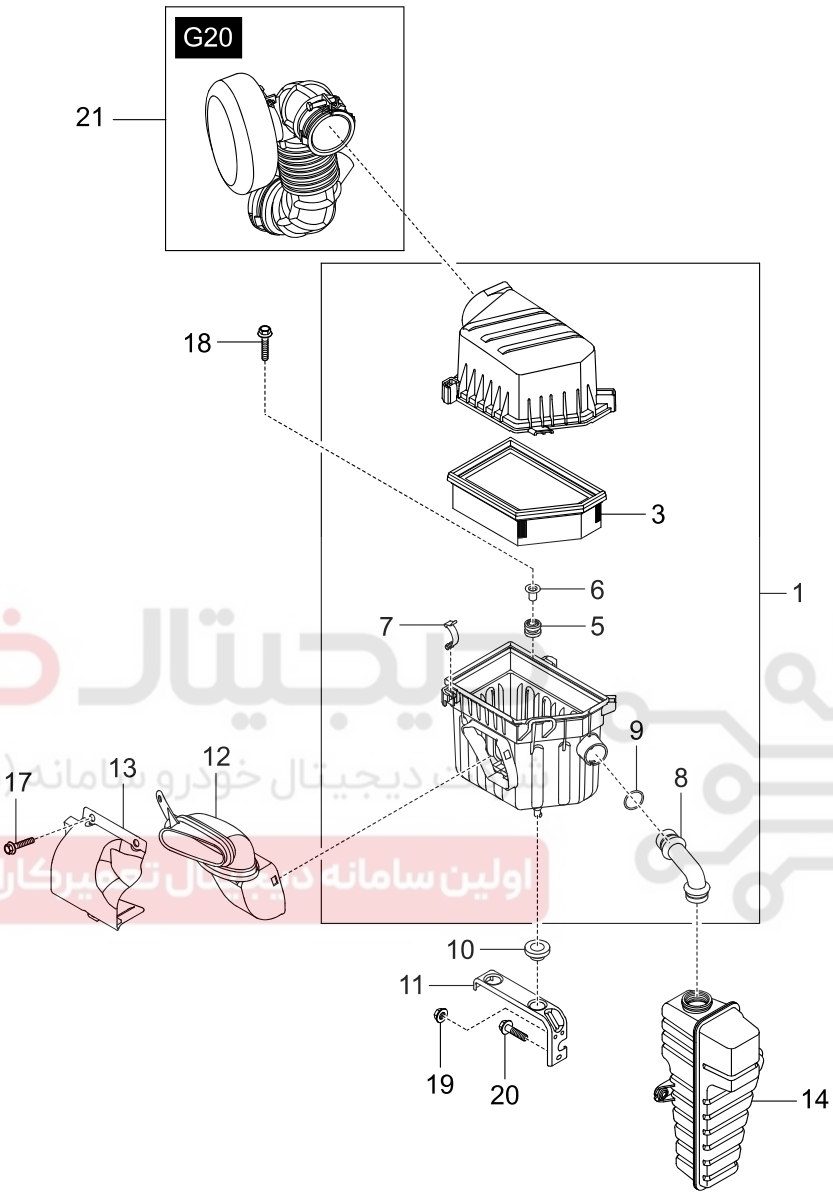
* Shorten the service interval under severe conditions such as driving on a dusty road or offroad.

2. LAYOUT



1. Intake Manifold Assy
2. Bolt
3. T-MAP sensor
4. Bolt
5. Intake Manifold Brkt
6. Bolt
7. Electric Throttle Body
8. Bolt
9. Acoustic Cover

Modification basis	
Application basis	
Affected VIN	



1. Air Cleaner Assy
3. Element Assy
5. Air Cleaner MTG NO.2
6. Insulator Collar
7. Spring Clamp
8. Resonance Duct
9. Resonance O-Ring
10. Air Cleaner MTG NO.1
11. Air Cleaner MTG Bolt
12. Snorkel Assy
13. Water Portector
14. Resonator Assy
17. RR Fascia MTG Screw Rivet
18. Bolt
19. Nut
20. Screw
21. Air Cleaner to Engine Hose Assy

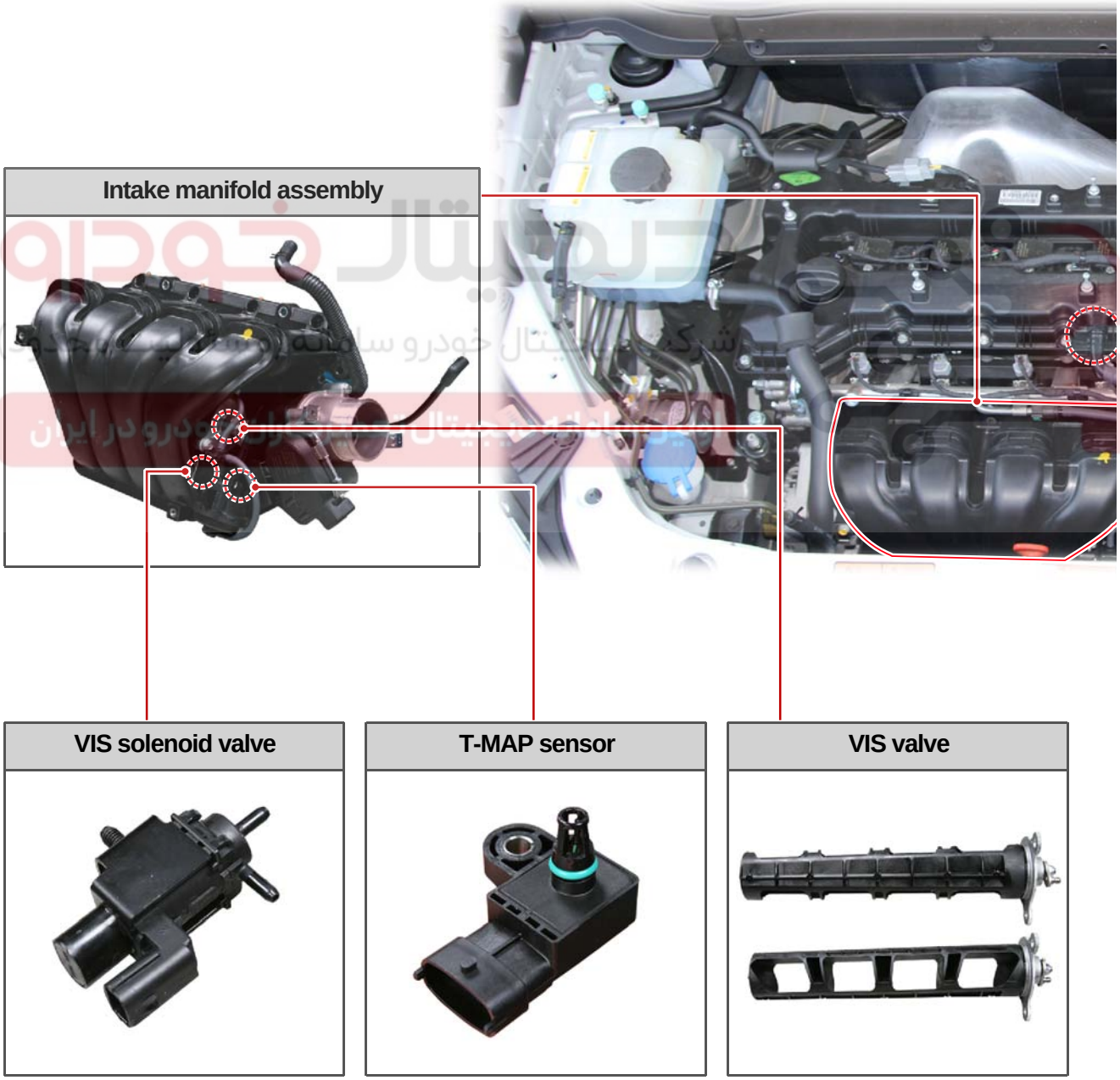
Modification basis	
Application basis	
Affected VIN	

OVERVIEW AND OPERATING PROCESS

1. OVERVIEW

To improve the engine performance, the VIS system has been introduced in the intake manifold. It provides the “Long Runner” in low speed and the “Short Runner” in high speed.
And, to reduce the internal pulsation in the intake manifold, the Runner # 1 and #2 are located in symmetry position with Runner #3 and #4. To reduce the air resistance, the throttle body is tilted b

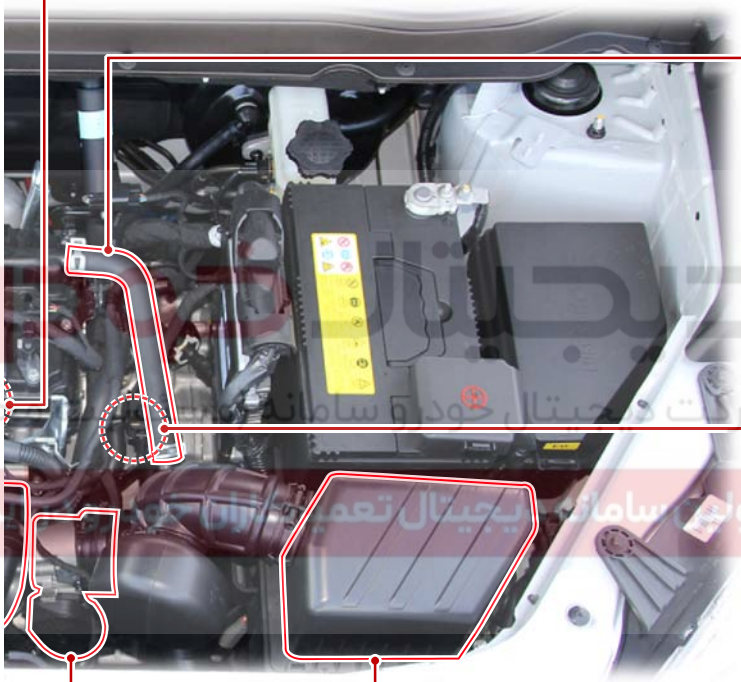
2. COMPONENTS



Modification basis	
Application basis	
Affected VIN	

PCV valve

Blow-by hose



Purge control solenoid valve

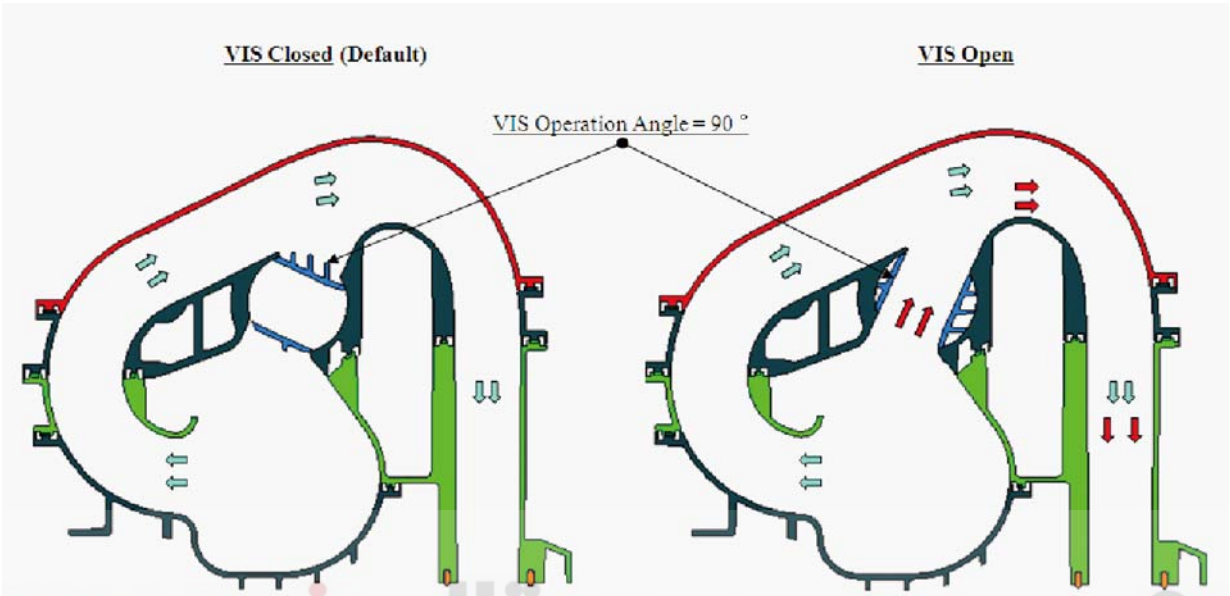
Electronic throttle body

Air cleaner element

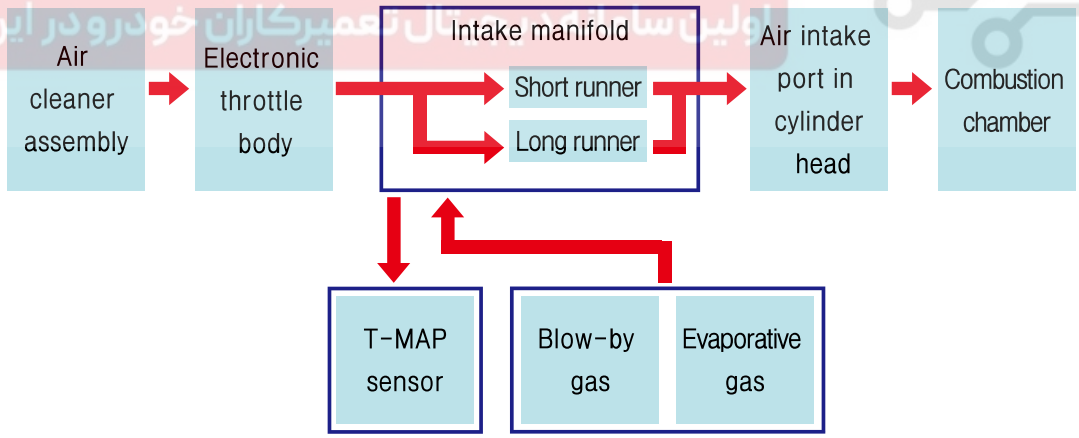
Modification basis	
Application basis	
Affected VIN	

3. OPERATING PROCESS

When Long Runner is operating	When Short Runner is operating

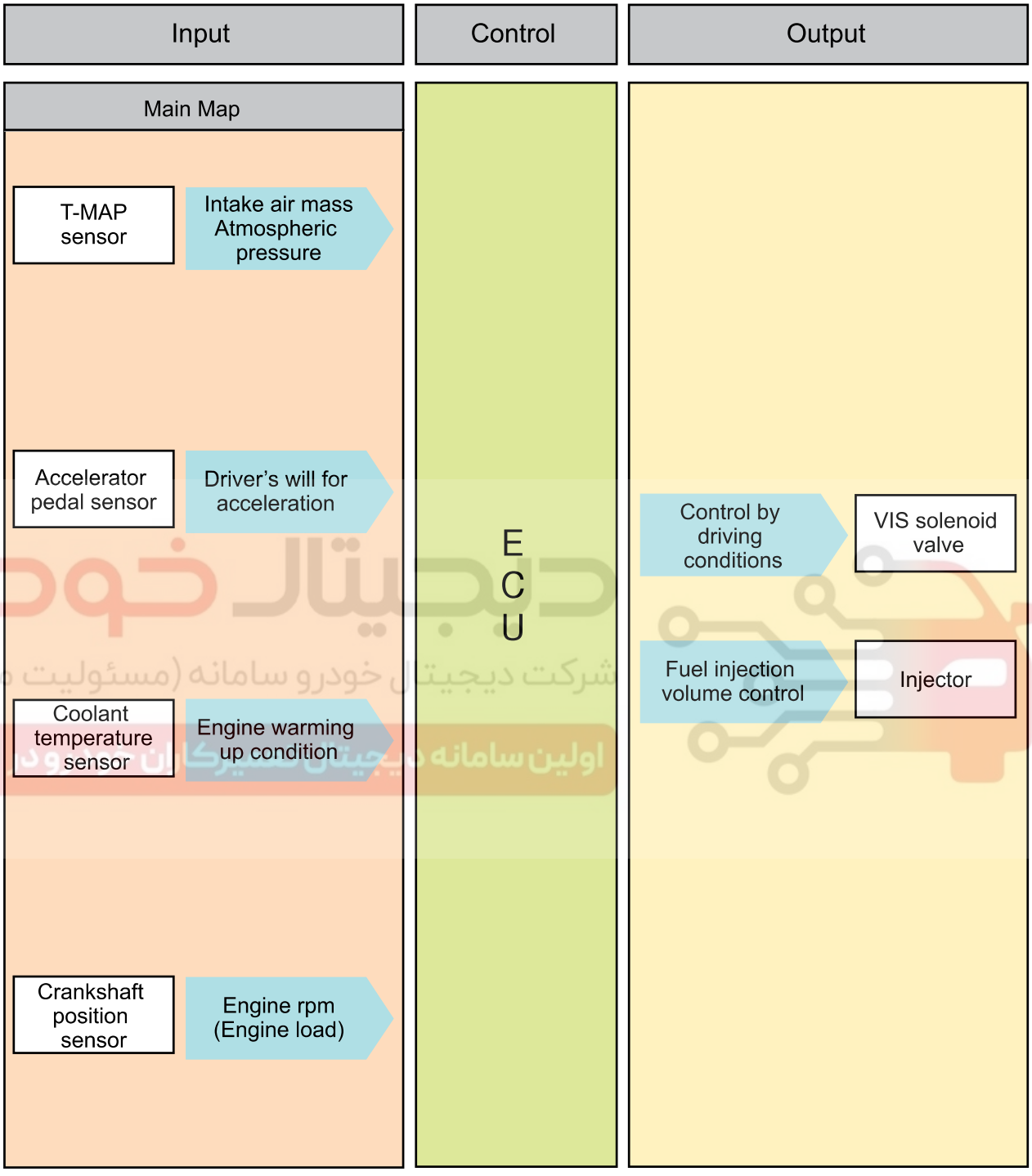


Intake air flows



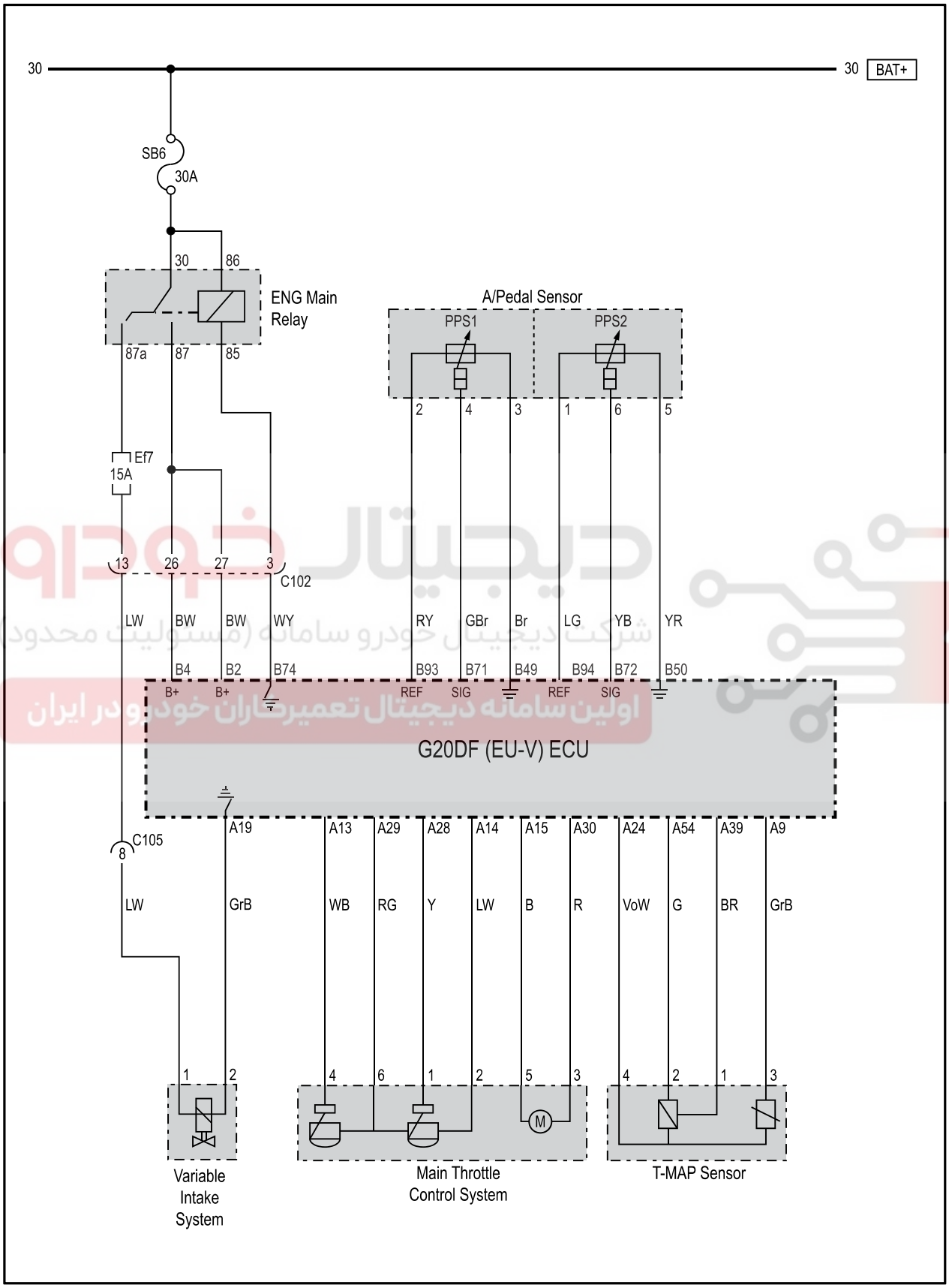
Modification basis	
Application basis	
Affected VIN	

4. INPUT/OUTPUT DEVICES



Modification basis	
Application basis	
Affected VIN	

5. CIRCUIT DIAGRAM



Modification basis	
Application basis	
Affected VIN	

CONFIGURATION

S.G.N. 2313-03

AIR CLEANER ASSEMBLY

1) Overview

The air cleaner element is a device which removes contaminants from the air. The air cleaner element should be cleaned and changed in the specific interval. The air cleaner system in G20DF engine uses the dry paper type element.

CAUTION

Shorten the service interval under excessive use or severe conditions such as driving on a dusty road or off-road, or driving in rain.

NOTE

Vehicle symptoms if service interval is not kept

- Insufficient engine power
- Excessive emissions
- Prematurely worn engine cylinder wall, piston, piston ring and intake valve

Modification basis	
Application basis	
Affected VIN	

S.G.N. 1740-01

VARIABLE INDUCTION MANIFOLD ASSEMBLY

1) Overview

The variable induction manifold assembly in G20DF engine transfers the air through the air cleaner element to the air intake port. And, to reduce the internal pulsation in the intake manifold, the electronic throttle body is tilted by 15°.
To improve the engine performance, the variable induction system operates the "Long Runner" in low speed and the "Short Runner" in high speed.

Variable induction manifold

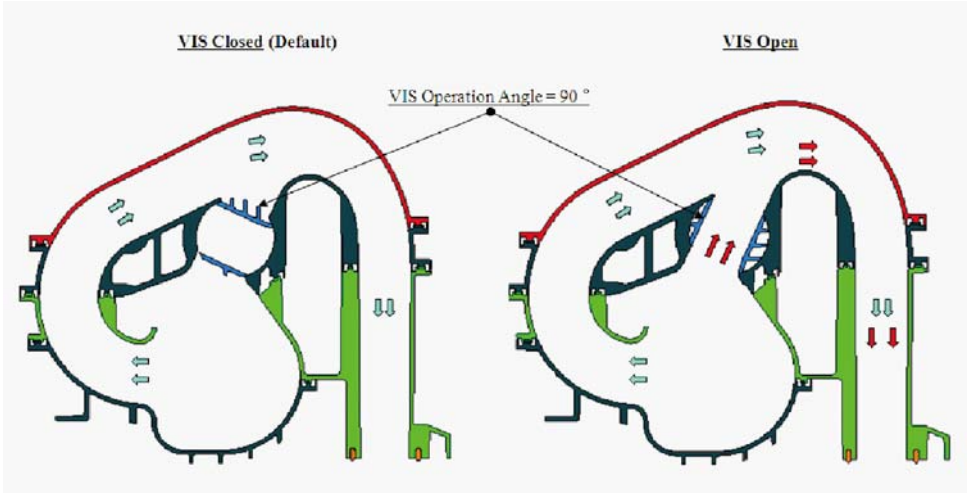
Features

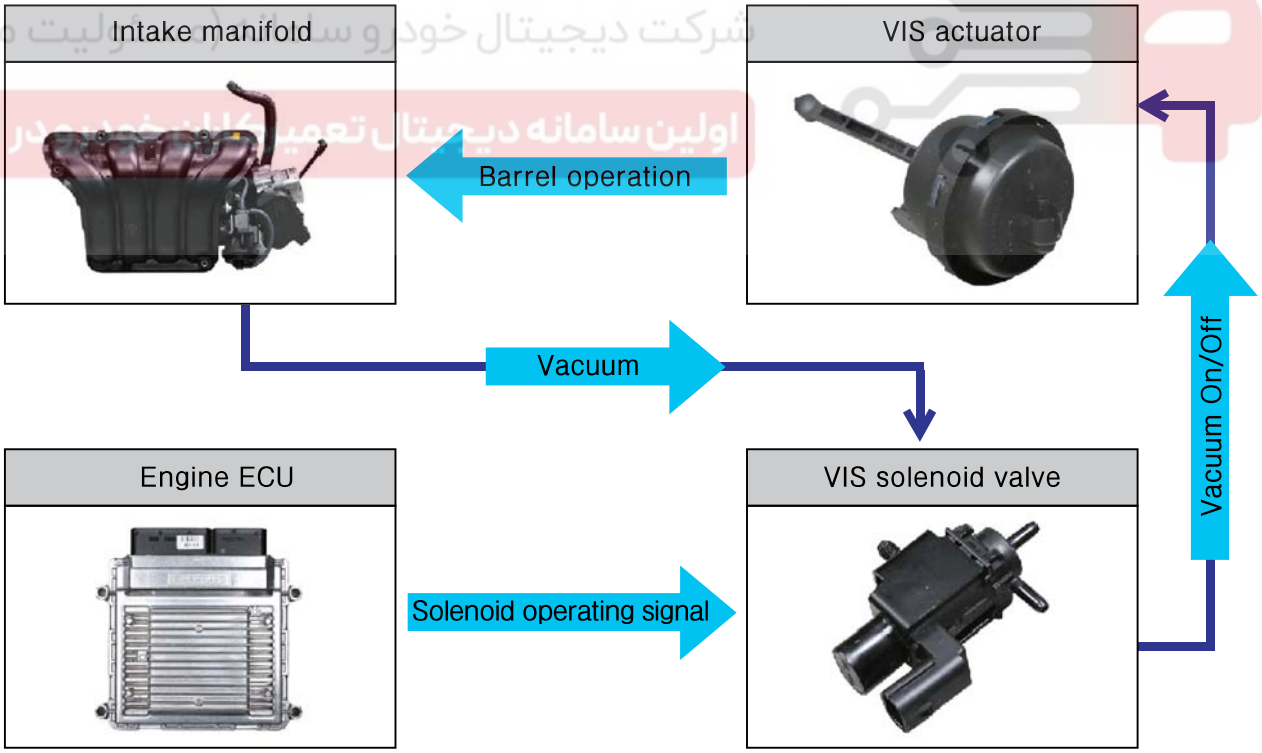
A. The symmetry design minimizes the length difference between #1 & 2 and #3 & 4. And, it reduces the difference of intake air volume.

B. 15° tilted throttle body provides the straight air passage, accordingly it minimizes the air resistance.

Modification basis	
Application basis	
Affected VIN	

2) Barrel Operations in Variable Induction Manifold

VIS close	VIS closed	VIS open
		
Barrel valve	Close	Open
Main air flow	Long Runner	Short Runner
Length of runner	476 mm	309 mm



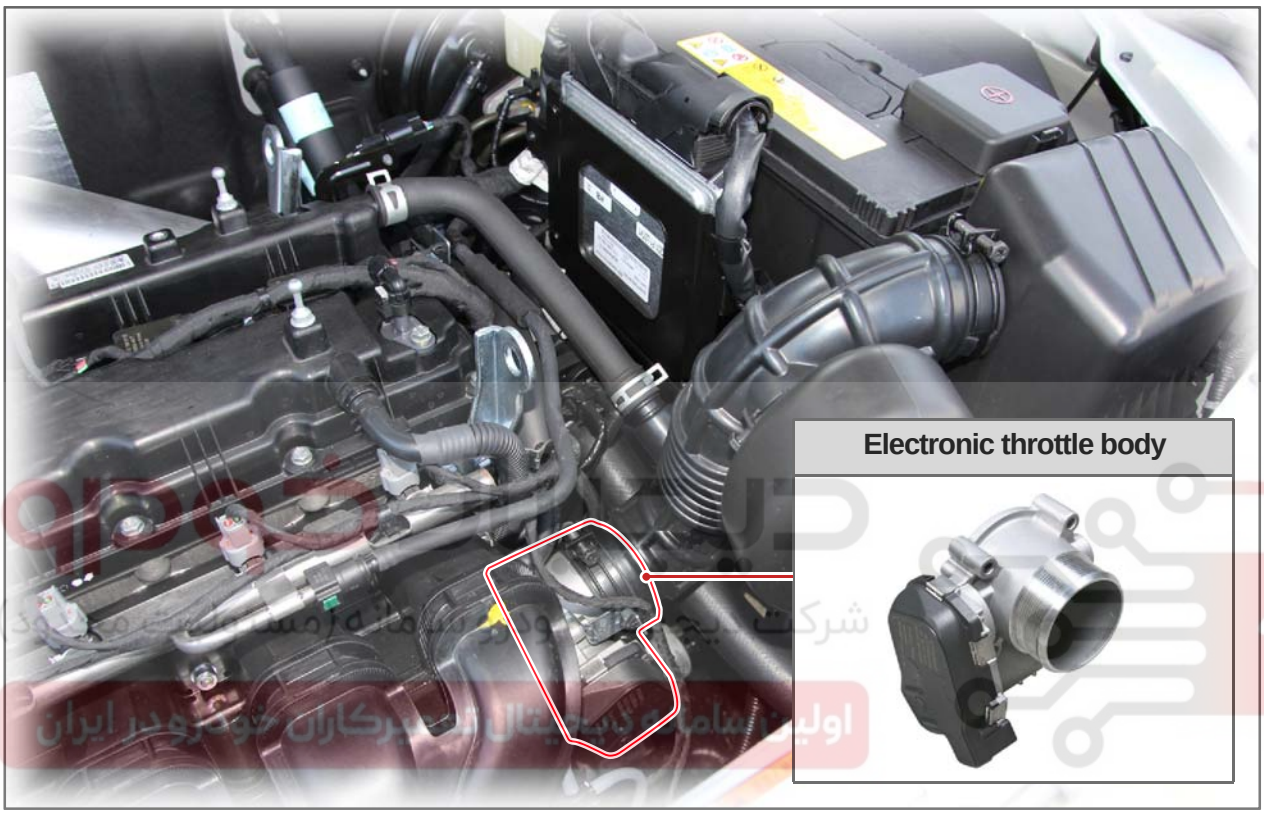
Modification basis	
Application basis	
Affected VIN	

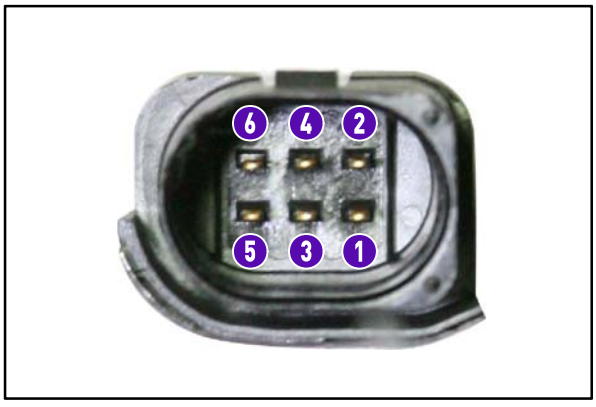
S.G.N. 1740-07

ELECTRONIC THROTTLE BODY

1) Overview

The electronic throttle body is installed at the front side of intake manifold.
This is one of the factors to determine the engine load according to the accelerator pedal positions. The throttle position is sent to the engine ECU by output voltage.





CONNEC TOR ASSIGNMENT		
1	IS2	Sensor2
2	S +	Sensor +
3	M −	Motor −
4	IS1	Sensor1
5	M +	Motor +
6	S −	Sensor −

Modification basis	
Application basis	
Affected VIN	

S.G.N.
2313-14 RESONATOR ASSEMBLY

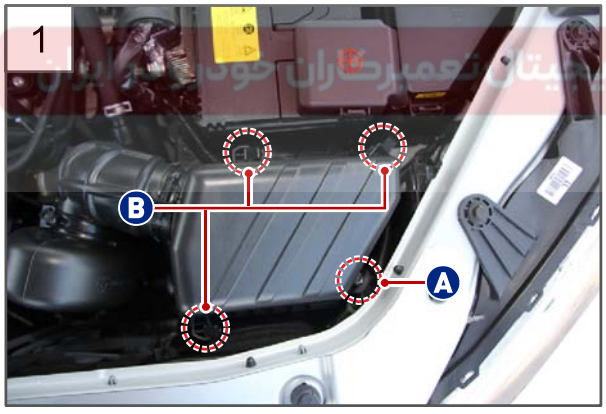
1) Overview

The resonator restraints the resonance noise by air fluctuation, and is located between air cleaner lower housing and air cleaner hose assembly.

Modification basis	
Application basis	
Affected VIN	

REMOVAL AND INSTALLATION

S.G.N. 2313-03 AIR CLEANER ELEMENT



1. Unscrew the bolt (A, 10 mm) and release three clips (B) on the air cleaner upper housing.

2. Remove the air cleaner upper housing.

Modification basis	
Application basis	
Affected VIN	

3

3. Remove the air cleaner element.

NOTE

Blow the compressed air through the element in the opposite direc-tion to normal air flow to clean the element.

4

4. Install the air cleaner element in the reverse order of removal.

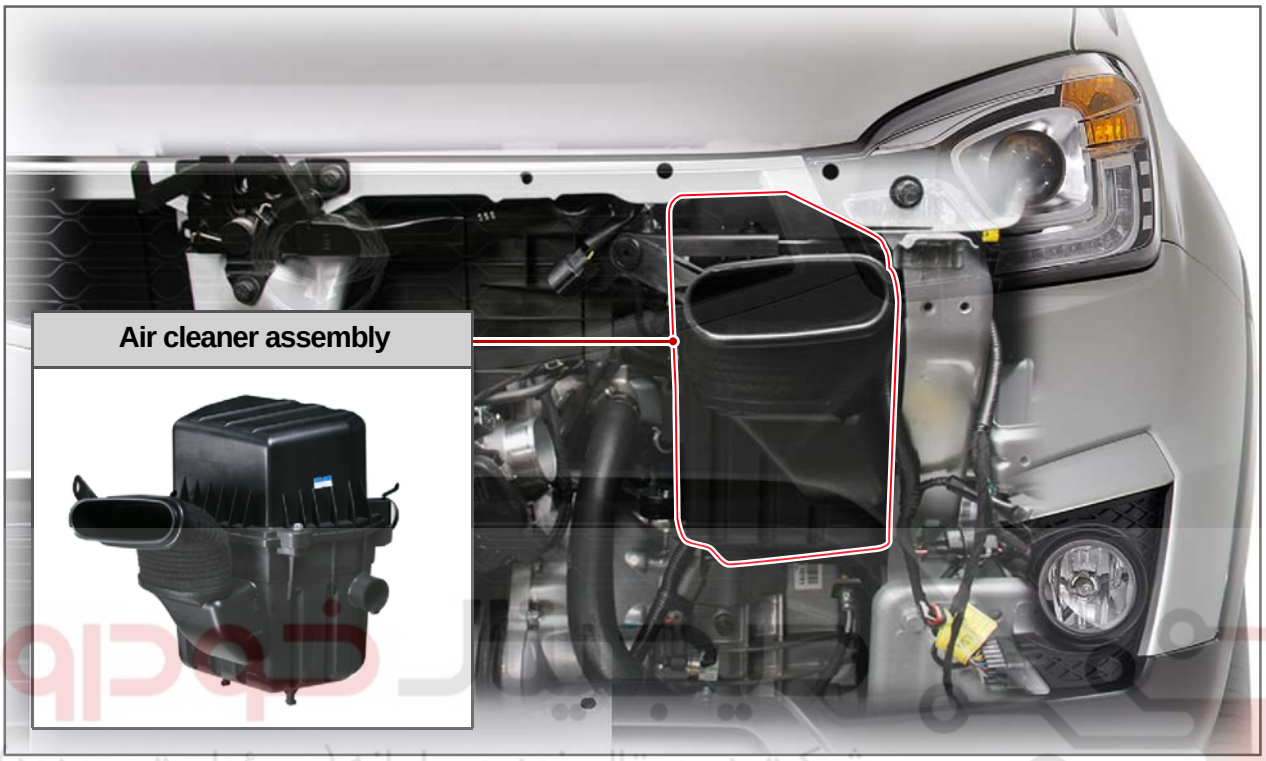
CAUTION

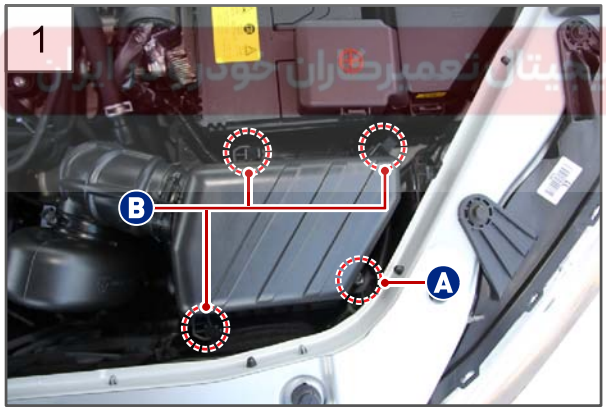
- Use only the genuine air cleaner element.
- Do not let any object enter the housing when cleaning the air clean-yyer. It may damage the engine or may cause an engine to stall. If you blow the compressed air to the opposite direction, the engine yywill be damaged due to foreign materials entering.

Modification basis	
Application basis	
Affected VIN	

S.G.N.
2313-01 AIR CLEANER ASSEMBLY

Preceding work - Disconnect the negative cable from the battery.





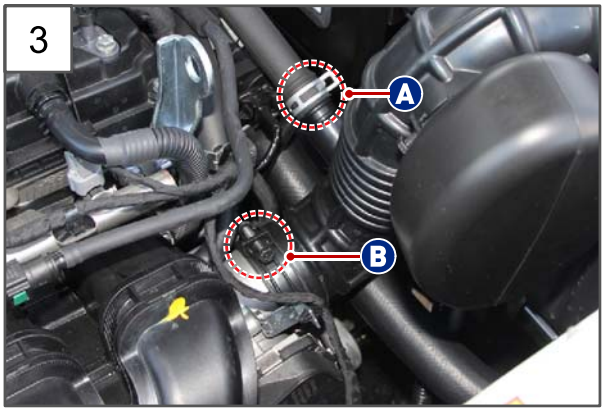
1. Unscrew the bolt (A, 10 mm) and release three clips (B) on the air cleaner upper housing.

2. Release the clamp and remove the air cleaner upper housing.

Tightening torque 6.0 ~ 7.0Nm

Modification basis	
Application basis	
Affected VIN	

3



3. Release the clamp (A) to blow-by hose and the clamp (B) to electronic throttle body.

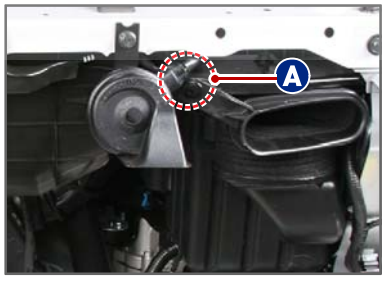
Tightening torque (B) 6.0 ~ 7.0Nm

4

4. Remove the air cleaner hose assembly.

5

5. Remove the fastener (A) from the snorkel assembly.



6

6. Unscrew the bolt (10 mm) from the air cleaner lower housing.

Tightening torque 9.0 ~ 10.0Nm

Modification basis	
Application basis	
Affected VIN	

7

7. Separate the air cleaner lower housing lock.

8

8. Remove the air cleaner assembly.

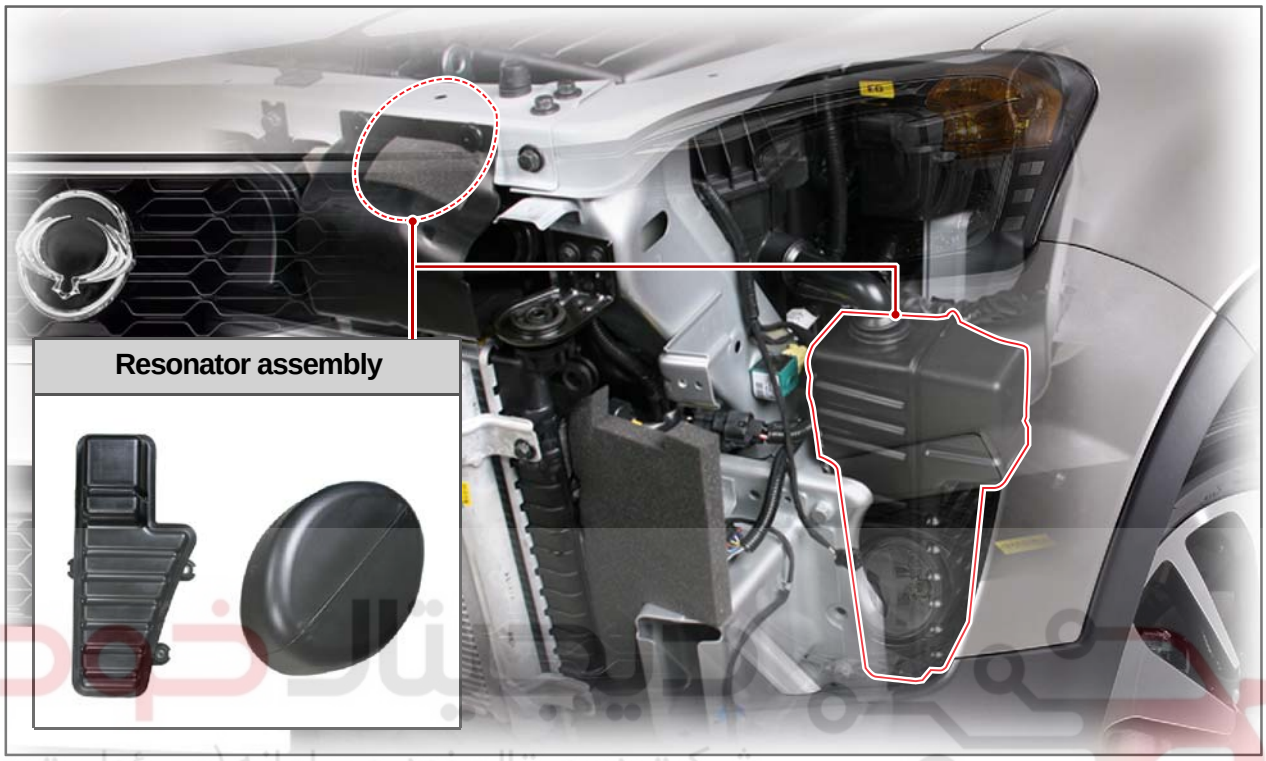
9. Install the air cleaner assembly in the reverse order of removal.

Modification basis	
Application basis	
Affected VIN	

S.G.N. 2313-14

RESONATOR

Preceding work - Disconnect the negative cable from the battery.



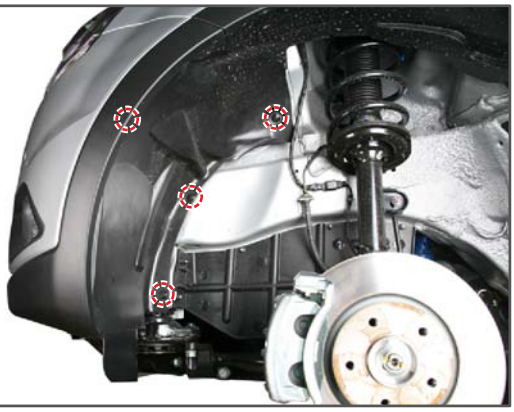
1. Release the clamp.

2. Remove the upper resonator chamber.

Tightening torque 6.0 ~ 7.0Nm

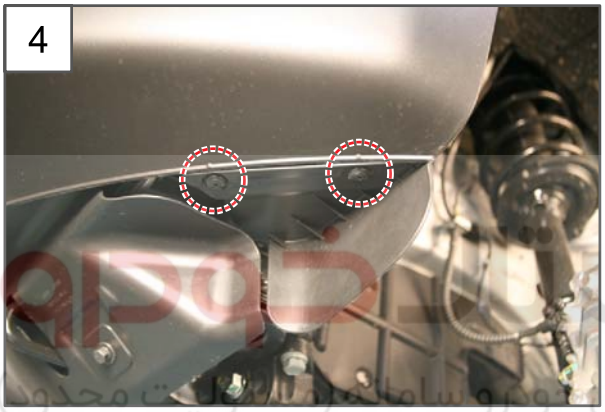
Modification basis	
Application basis	
Affected VIN	

3



3. Unscrew four fasteners from the left wheelhouse cover.

4

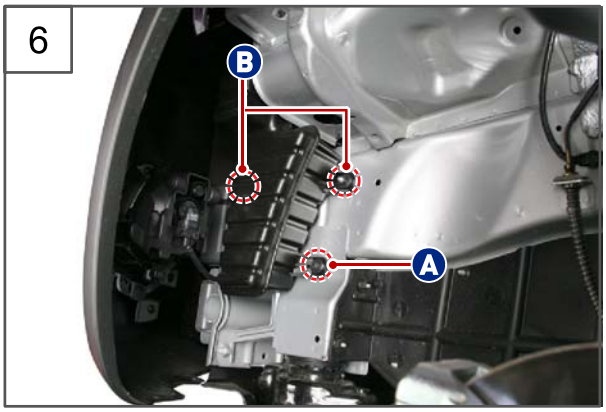


4. Unscrew four fasteners from the bottom of left wheelhouse cover.

5

5. Separate the left wheelhouse cover.

6



6. Unscrew the bolt (A) and the nut (B) from the resonator.

Tightening torque 9.0 ~ 10.0Nm

Modification basis	
Application basis	
Affected VIN	

7

7. Remove the resonator chamber.

8

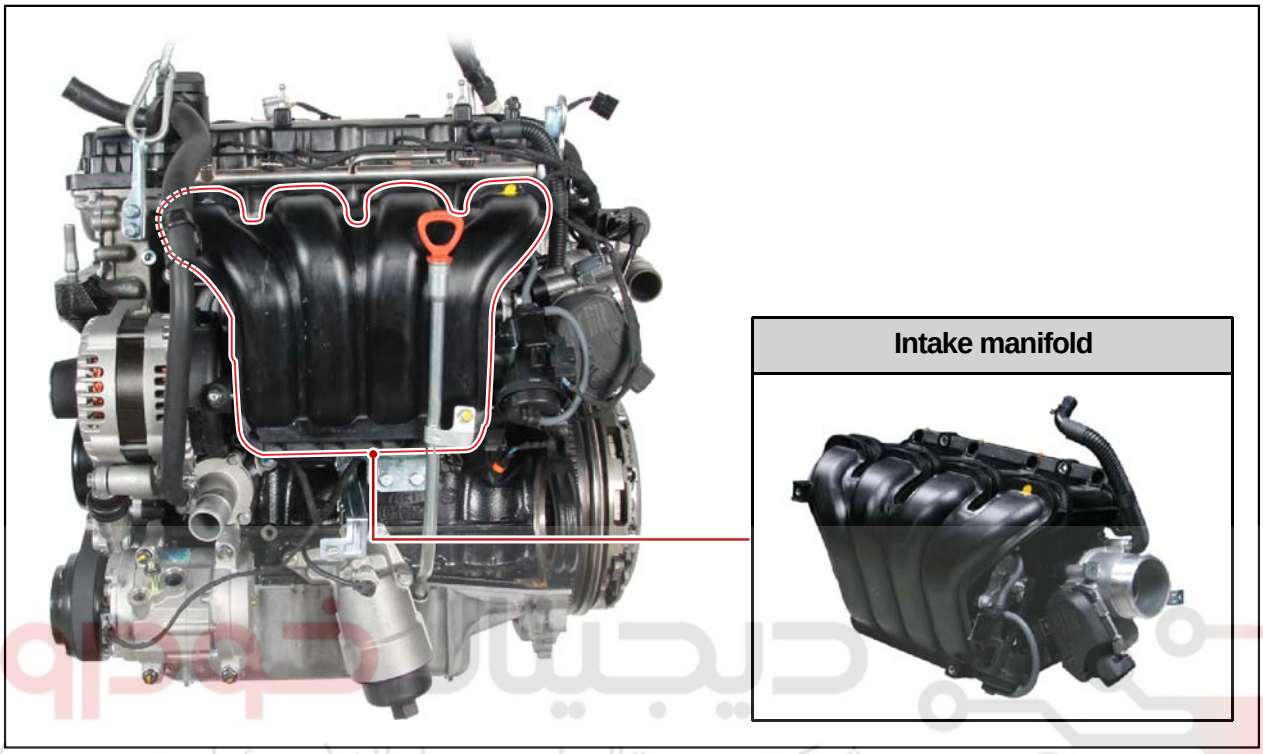
8. Install the resonator in the reverse order of removal.

Modification basis	
Application basis	
Affected VIN	

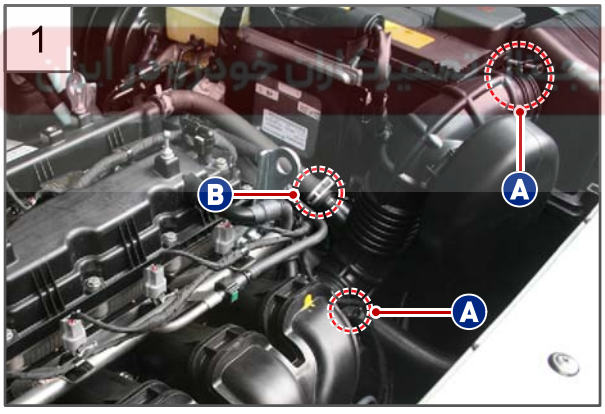
S.G.N. 1740-01

INTAKE MANIFOLD

Preceding work - Disconnect the negative cable from the battery.



1



1. Release the clamps (A) on the air cleaner upper housing and the electronic throttle body, and remove the blow-by hose (B).

Tightening torque (A) 6.0 ~ 7.0Nm

2

2. Remoev the air cleaner hose assembly.

Modification basis	
Application basis	
Affected VIN	

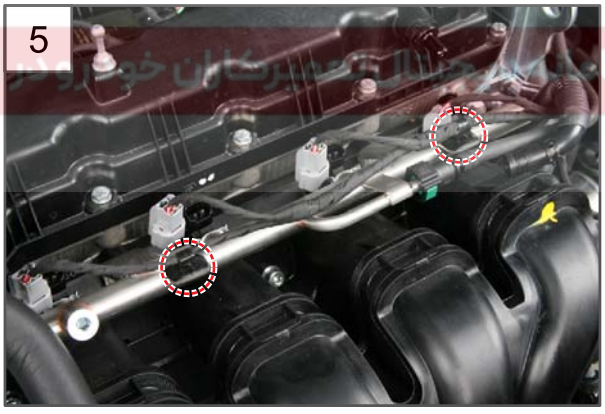
3

3. Release the clamp and remove the PCV hose.

4

4. Disconnect four injector connectors.

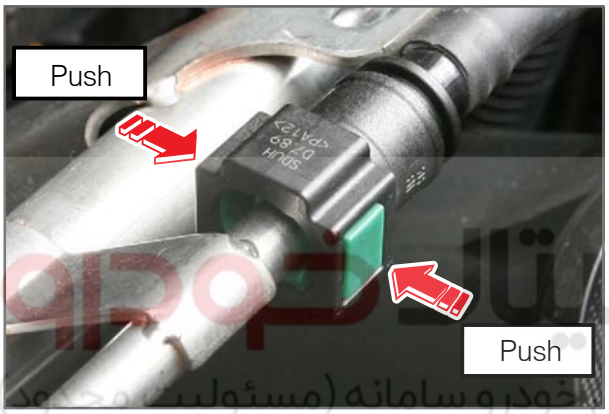
5

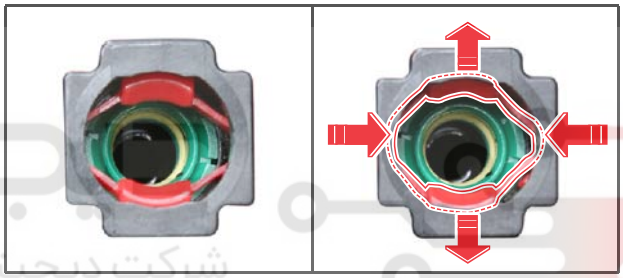


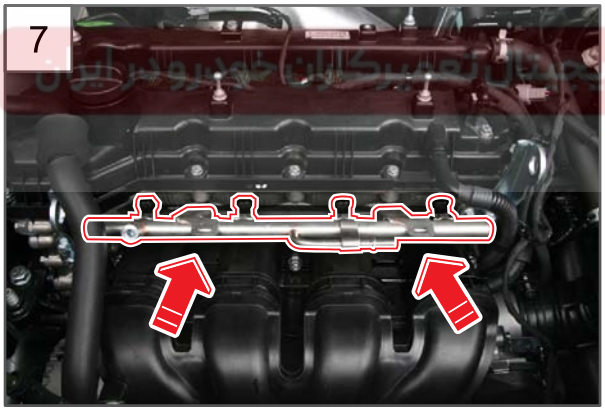
5. Release two clamps and separate the injector wiring harness.

6. Release the quick connector on fuel supply hose to fuel rail assembly.

CAUTION
Make sure not to spill out the fuel due to the pressure in the pipes.





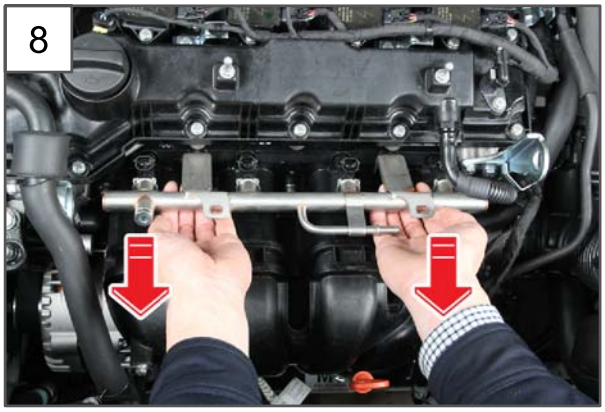


7. Unscrew two hexagon bolts (6 mm) from the fuel rail.

Tightening torque 25.0 ± 2.5Nm

Modification basis	
Application basis	
Affected VIN	

8



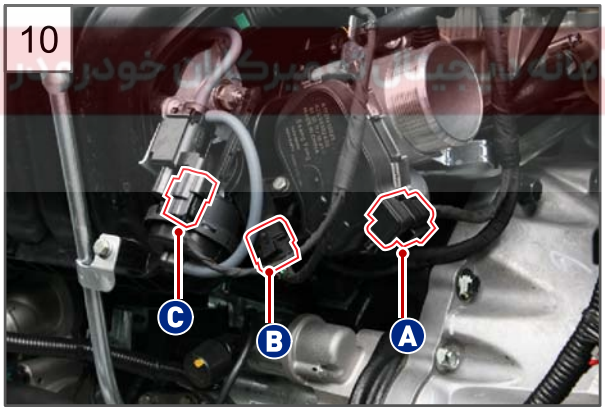
8. Separate the fuel rail assembly by pulling it evenly.

9

9. Remove the fuel rail assembly.

CAUTION
- Seal the injector mounting holes so that foreign material cannot get into the hole.

10



10. Disconnect the electronic throttle body connector (A), T-MAP sensor connector (B), VIS solenoid valve connector (C).

11

11. Separate the wiring harness from two locks.

Modification basis	
Application basis	
Affected VIN	

12

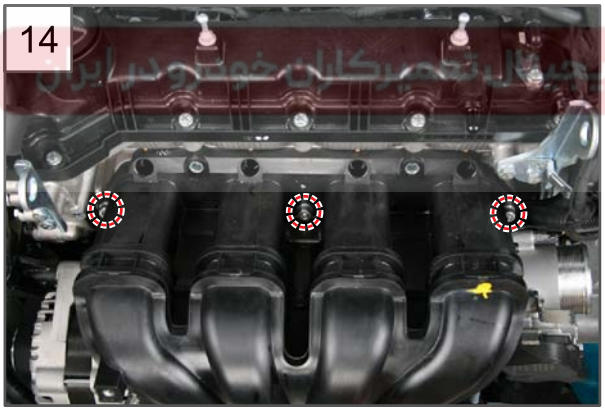
12.Remove the vacuum hose between intake manifold to brake vacuum booster.

13

13.Unscrew the makeup hose mounting bolt (10 mm) and the oil dipstick gauge mounting bolt (10 mm).

Tightening torque 10.0 ± 1.0Nm

14



14.Unscrew three upper bolts (6 mm) from the intake manifold.

Tightening torque 25.0 ± 2.5Nm

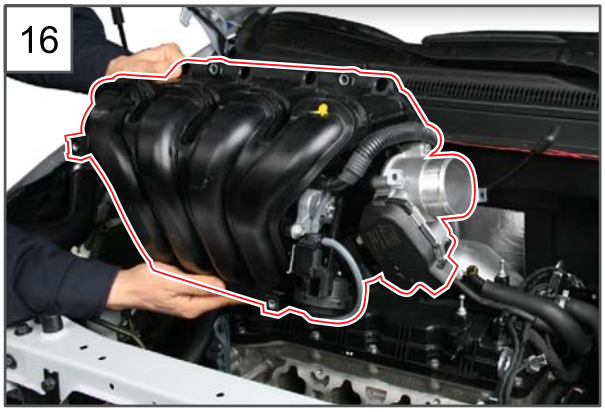
15

15.Unscrew two lower bolts (13 mm) from the intake manifold.

Tightening torque 25.0 ± 2.5Nm

Modification basis	
Application basis	
Affected VIN	

16



16.Remove the intake manifold assembly.

17

17.Install the intake manifold in the reverse order of removal.

Cautions when installing

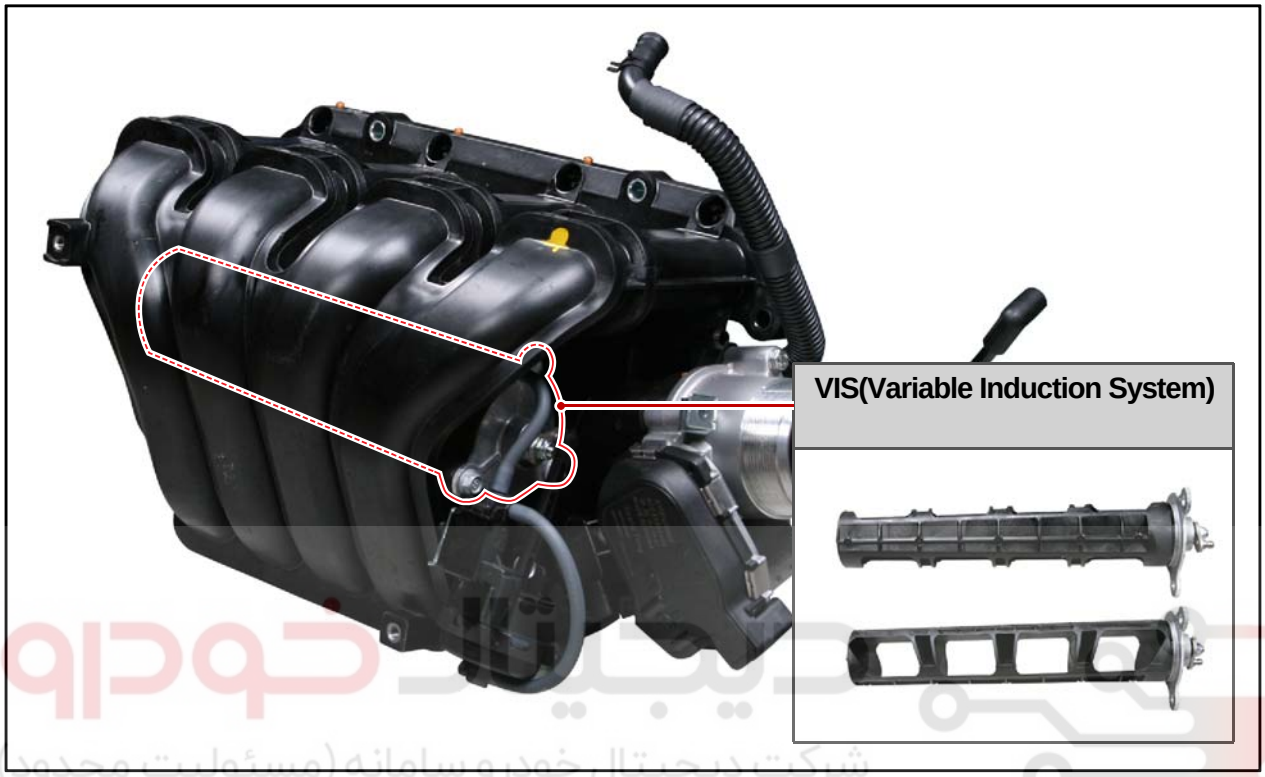
NOTE

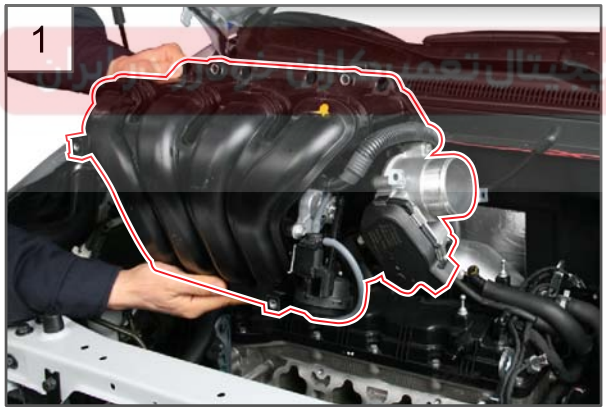
- Replace the gasket with new one.
- Tighten the intake manifold mounting bolts in two or more steps from inside.

S.G.N. 1740-00

VIS(Variable Induction System) BARREL

Preceding work - Disconnect the negative cable from the battery.





1. Remove the intake manifold assembly.

2. Unscrew four bolts (10 mm) from the electronic throttle body.

Tightening torque 9.0 ~ 10.0Nm

Modification basis	
Application basis	
Affected VIN	

3. Remove the VIS solenoid valve vacuum hose.

4. Unscrew the bolt and remove the VIS solenoid valve.

Tightening torque 9.0 ~ 10.0Nm

5. Release the linkage (A) from the vacuum assist device.

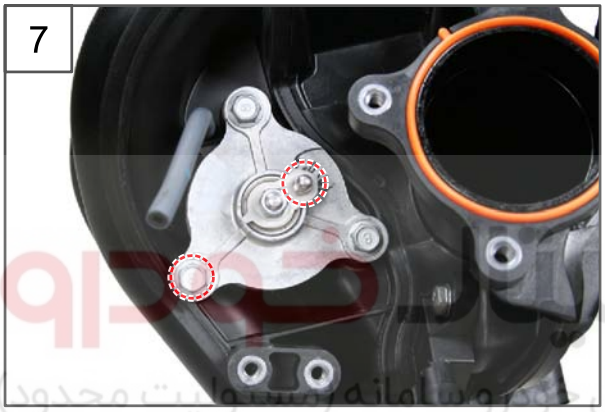
Modification basis	
Application basis	
Affected VIN	

6

6. Unscrew two bolts (10 mm) from the vacuum assist device.

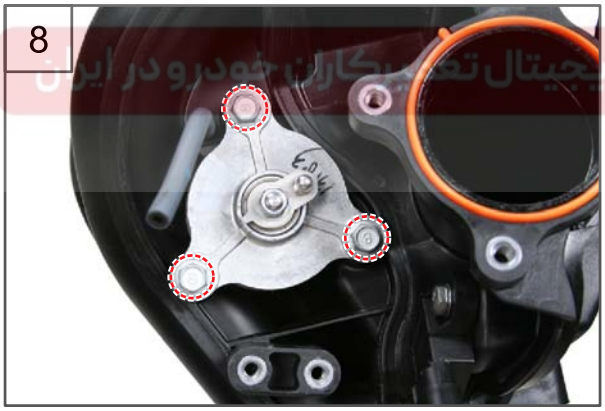
Tightening torque 9.0 ~ 10.0Nm

7



7. Place the mark on the VIS mounting bolt.

8



8. Unscrew three VIS mounting bolts.

Tightening torque 9.0 ~ 10.0Nm

9

9. Remove the VIS assembly.

Modification basis	
Application basis	
Affected VIN	

10

10.Remove the O-ring.

11

11.Install the VIS barrel in the reverse order of removal.

Modification basis	
Application basis	
Affected VIN	

Memo