

# EXHAUST SYSTEM

1430-09/1745-01/2421-01/2421-02/2421-03/2421-10/

## INDEX

## EXHAUST SYSTEM

### GENERAL INFORMATION

|                         |   |
|-------------------------|---|
| 1. TROUBLESHOOTING..... | 3 |
| 2. LAYOUT.....          | 4 |
| 3. CAUTIONS.....        | 6 |

### REMOVAL AND INSTALLATION

|                               |    |
|-------------------------------|----|
| 1745-01 EXHAUST MANIFOLD..... | 22 |
| 2421-01 WCC COMPLETE.....     | 28 |
| 2421-03 UCC COMPLETE.....     | 33 |
| 1430-09 OXYGEN SENSOR.....    | 35 |
| 2421-02 MUFFLER ASSEMBLY..... | 38 |

### OVERVIEW AND OPERATING PROCESS

|                                     |    |
|-------------------------------------|----|
| 1. OVERVIEW.....                    | 7  |
| 2. COMPONENTS.....                  | 8  |
| 3. WORK FLOW IN EXHAUST SYSTEM..... | 10 |
| 4. INPUT/OUTPUT DEVICES.....        | 11 |

### CONFIGURATION

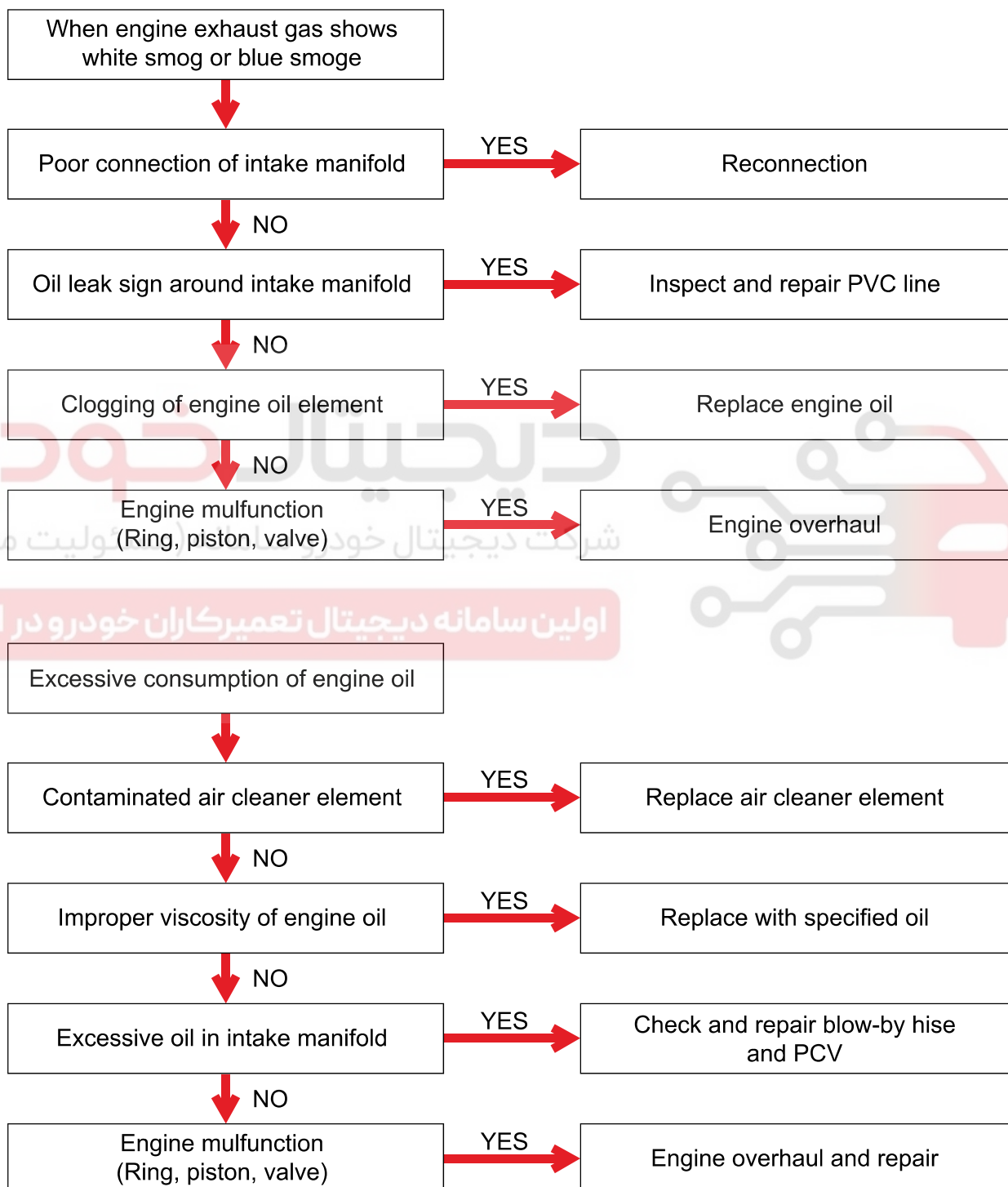
|                                  |    |
|----------------------------------|----|
| 2421-01 CATALYTIC CONVERTER..... | 12 |
| 1430-09 OXYGEN SENSOR.....       | 17 |
| 1745-01 EXHAUST MANIFOLD.....    | 19 |
| 2421-02 MUFFLER ASSEMBLY.....    | 20 |
| 2421-10 HANGER.....              | 21 |

# دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



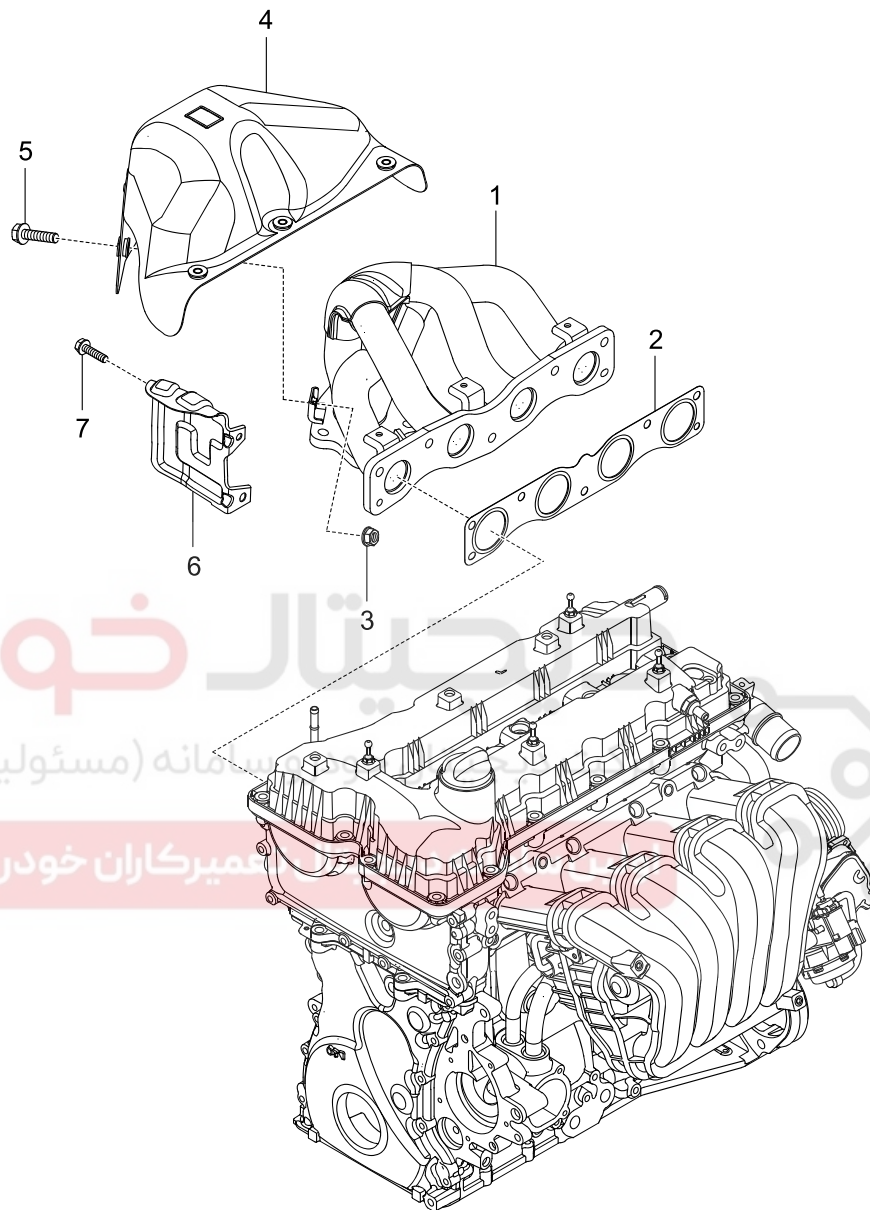
**EXHAUST SYSTEM****1745-01****GENERAL INFORMATION****1. TROUBLESHOOTING**

|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

EXHAUST SYSTEM

KORANDO 2013.08

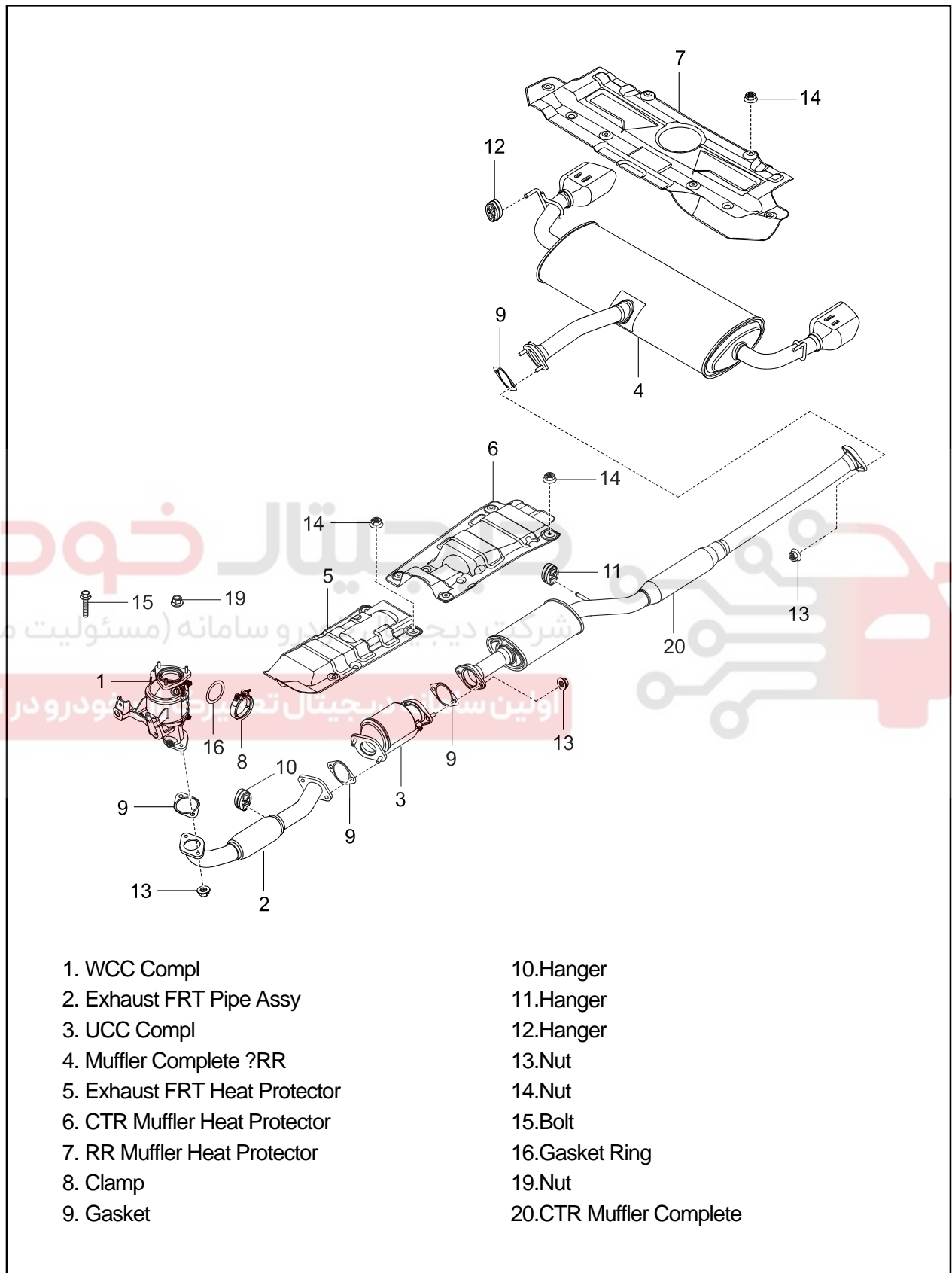
## 2. LAYOUT



1. Exhaust Manifold Assy
2. Exhaust Manifold Gasket
3. Hex Flange Nut
4. Heat Protector Assy
5. Hex Bolt (M6 X 1 X 25)
6. Heat Protector Assy
7. Hex Bolt (M8 X 1.25 X 16)

|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |





|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

EXHAUST SYSTEM

KORANDO 2013.08

### 3. CAUTIONS

- Do not park the vehicle on flammable materials, such as grass, leaves and carpet.
- Do not touch the catalyst or the exhaust gas ignition system when the engine is running.
- If a misfire occurs in the combustion chamber or the emission of pollutant exceeds the specified level, the catalyst can be damaged.
- When servicing or replacing components of the exhaust system, makes sure that the components are positioned at regular intervals from all other parts of the under body.
- Be careful not to damage the exhaust system when lifting the vehicle from its side.
- All components and body parts of the engine exhaust system should be inspected for crack, damage, air hole, part loss and incorrect mounting location. Also check for any deformation which can result in exhaust gas drawn into the vehicle.
- Make sure that the exhaust pipe is cooled down sufficiently before working on it because it is still hot right after the engine is stopped.
- Wear protective gloves when removing the exhaust pipe.

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

## OVERVIEW AND OPERATING PROCESS

### 1. OVERVIEW

This system purifies the exhaust gas generated by the combustion in the engine to reduce the pollutants and noise during that arise during combustion.

Harmful materials produced in the combustion process is treated and reduced in the exhaust system.

Harmful materials discharged from the crankcase and fuel tank is drawn into the intake system again to reduce discharge amount of harmful materials.

#### ► Emission aftertreatment system

##### - Catalytic Converter & O2 Sensor

The catalytic converter is a monolith type purification system composed of cordierite which purifies exhaust gas through the small holes of active monolith catalyst from the exhaust manifold. As exhaust gas passes through the small holes in the layer in the middle, its CO and HC are reduced by oxidization reaction and its NOx is reduced by reduction reaction to Pt, Ph and Pd. The oxygen sensor sends signals for feedback and determination of catalyst condition. For detailed description, see the corresponding section.

#### ► Purge Canister Control

The fuel evaporative gas is a gas evaporated to the atmosphere in the section between the fuel tank and fuel line, and its main component is hydrocarbon (HC). The fuel evaporative gas is temporarily stored in the canister, and it is drawn to the engine through the throttle body when the purge control solenoid valve is open according to the engine operating condition.


#### ► Blow-by gas control system (crankcase ventilation system)

Gas in the combustion chamber is sealed by the piston. However, gas is leaked through the gap between the cylinder and piston and drawn into the crankcase during the compression and explosion strokes. This gas is blow-by gas and its main components are hydrocarbon and carbon monoxide. If this gas is drawn into the crankcase, the system can be corroded and oil can be deteriorated. Also, if this gas is discharged into the air, it can pollute the environment. To prevent these, the blow-by gas reduction system (also called as crankcase ventilation system) draws the blow-by gas from the crankcase to the combustion chamber for combustion.


|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

2. COMPONENTS


WCC



Engine ECU



Engine CHECK lamp





Exhaust manifold



PCV valve

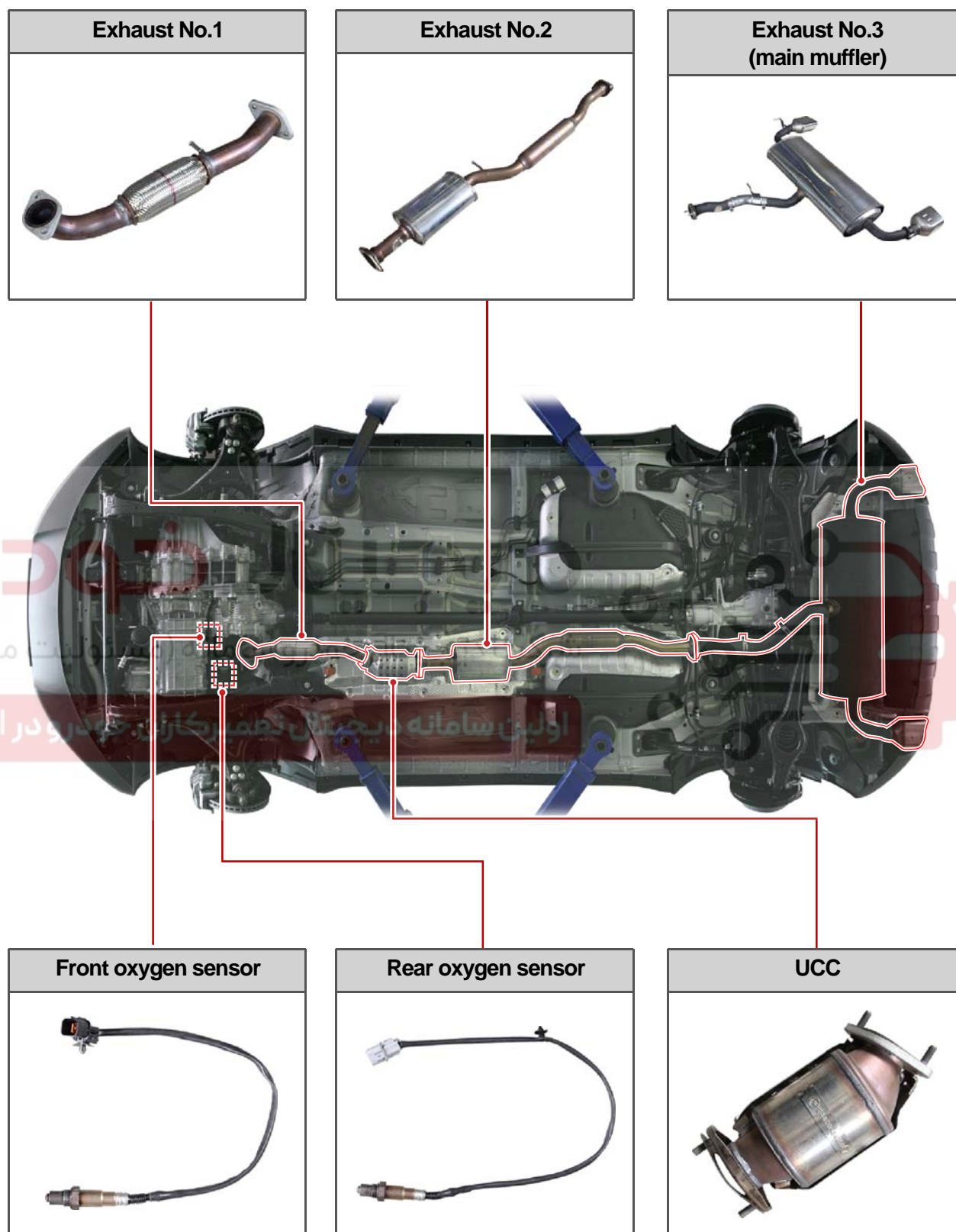


Blow-by hose



|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |



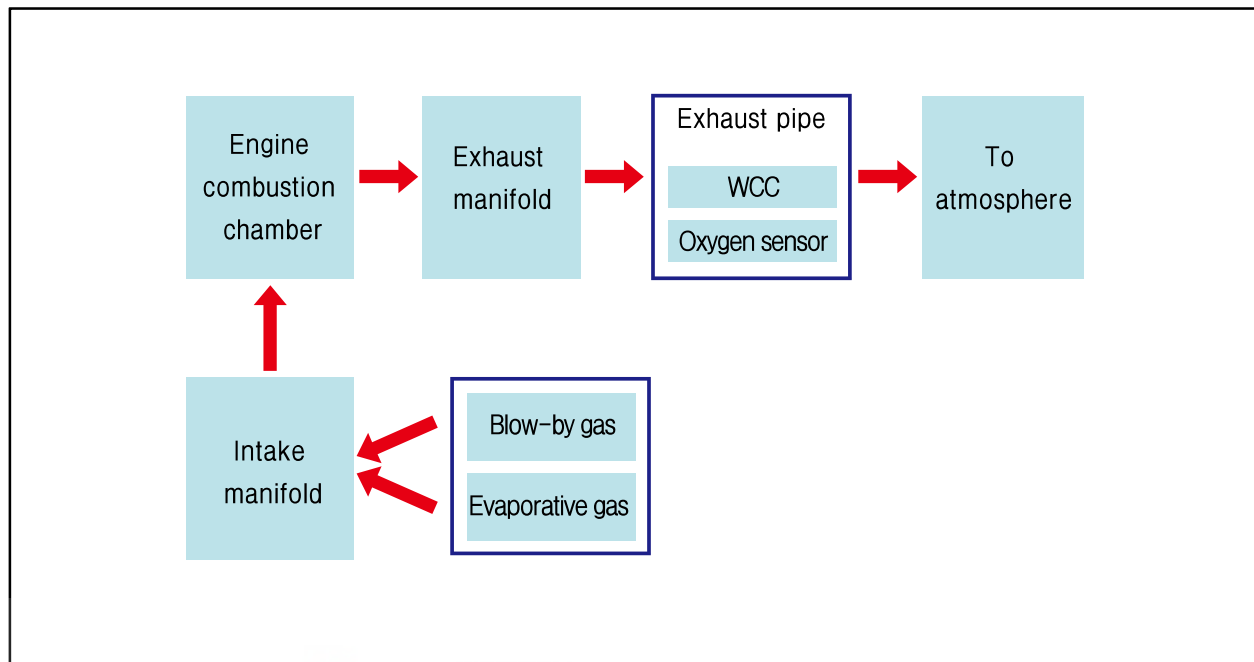


|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

EXHAUST SYSTEM

KORANDO 2013.08

### 3. WORK FLOW IN EXHAUST SYSTEM



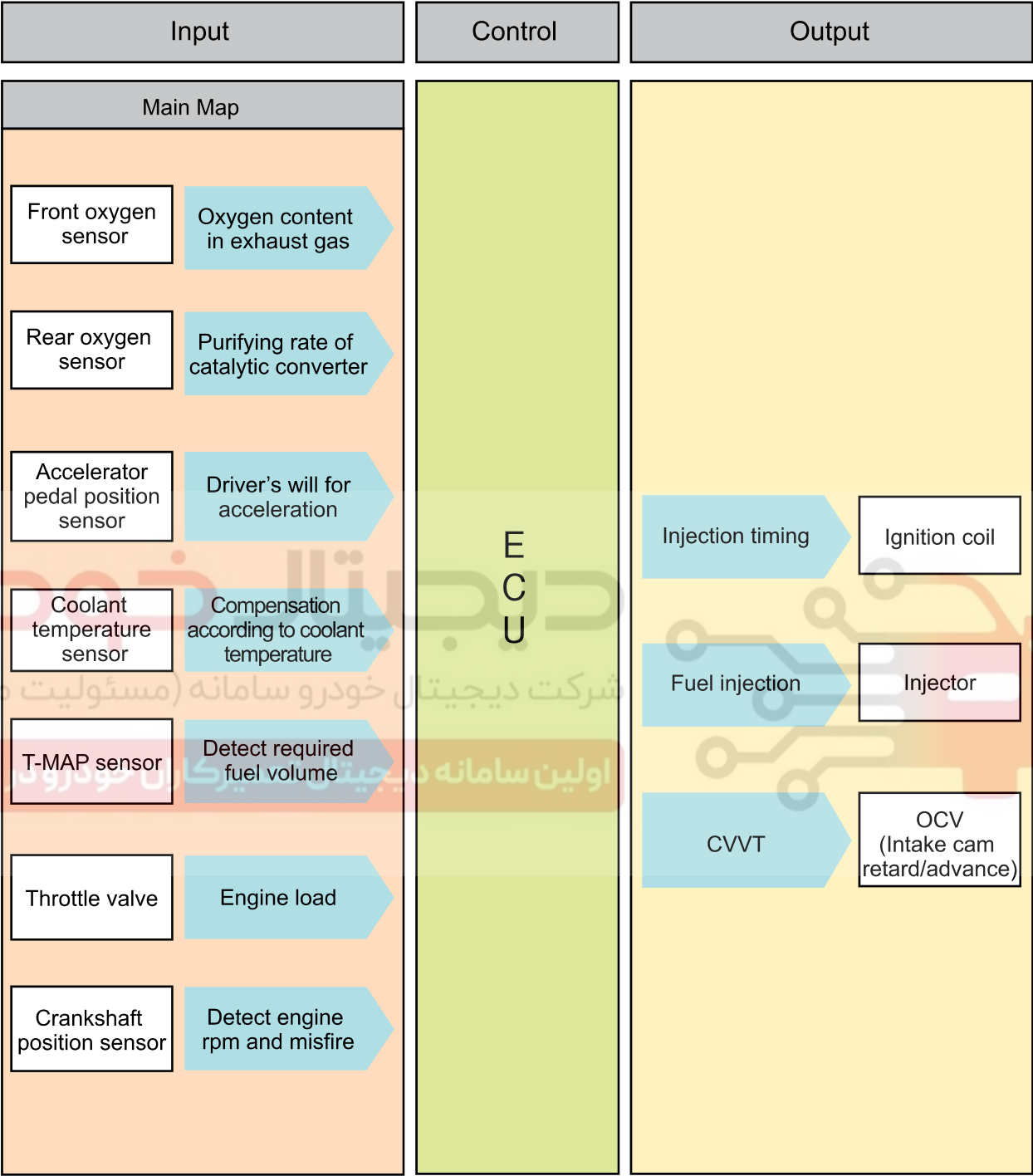
دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



4. INPUT/OUTPUT DEVICES

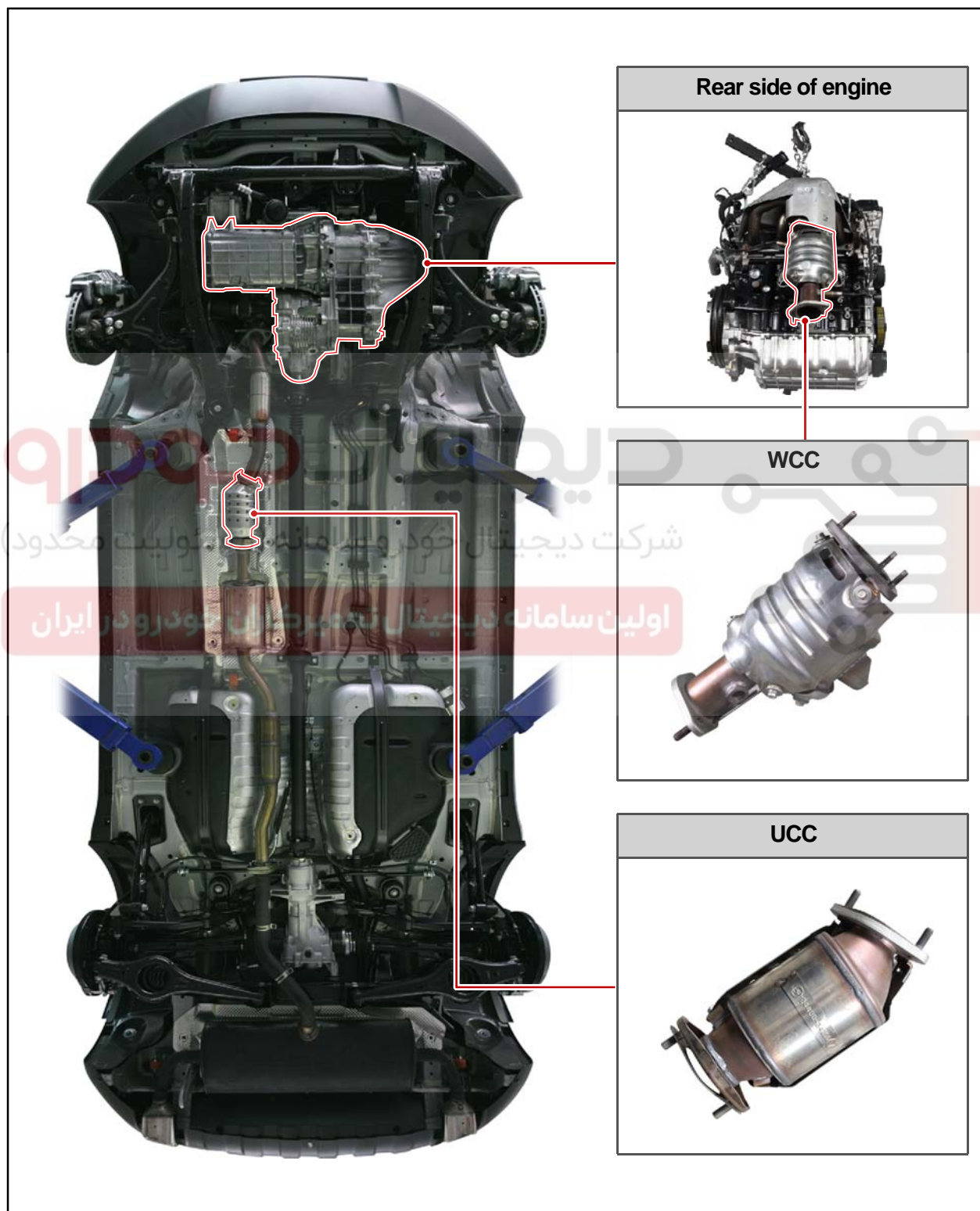


|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

## CONFIGURATION

### S.G.N. 2421-01 CATALYTIC CONVERTER

#### 1) Overview



EXHAUST SYSTEM

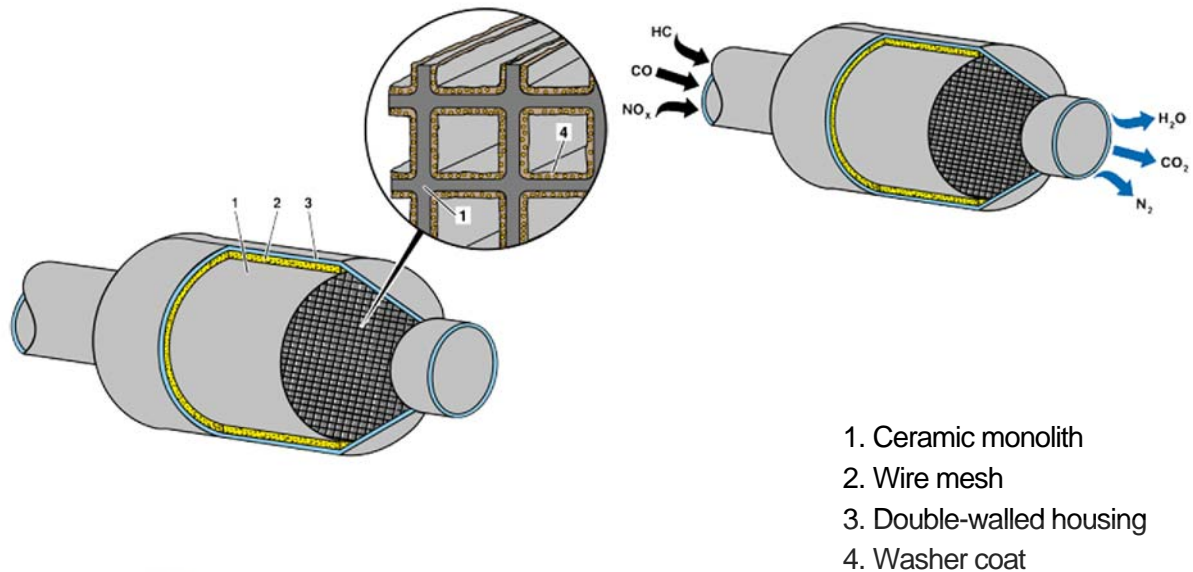
KORANDO 2013.08

|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |



## 2) Catalytic Converter

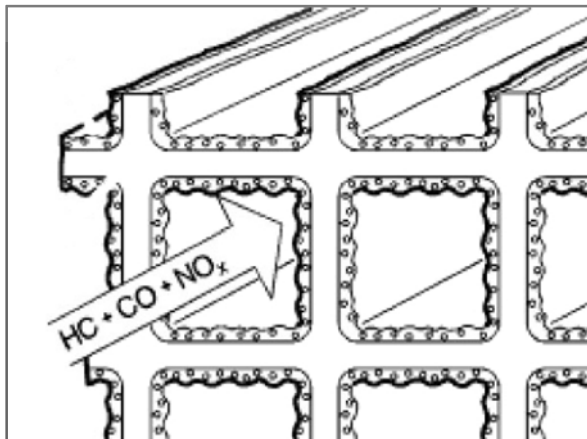
### Monolith catalytic converter



The washer coat is to make a contact surface with exhaust gas bigger by adhering closely to small holes of inner layer. If a lead compound or phosphorus adheres to the surface and the temperature rises, its surface area is decreased. Generally alumina ( $Al_2O_3$ ) is used as a raw material and its 7 phases of gamma, delta, theta have big surface areas and high stability for the temperature, and nowadays gamma alumina is used usually.

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

#### ► Structure of catalytic converter



#### A. Internal

- Body (basis): basic structure to maintain exhaust gas flow
- Middle layer: has approx. 700 small holes
- Catalyst: Pt, Ph, Pd  
Pt: oxidation catalyst for HC and CO  
Rh: Reduction reaction catalyst for NO

#### B. Mat

- assembled between body and can to seal and secure body.

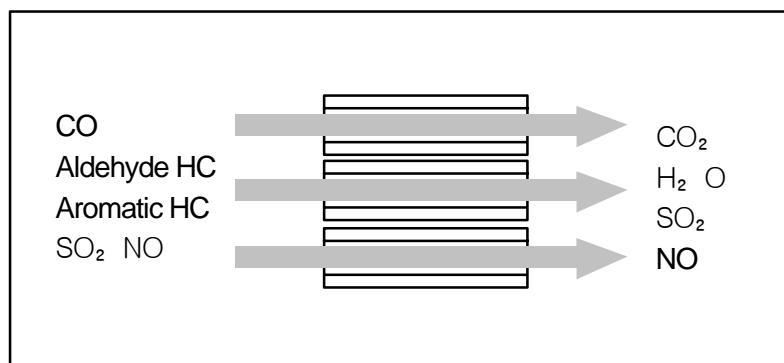
#### C. Can

- container (wraps body and mat)

|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

### A. Purification process

The 3-way catalyst reduces CO and HC by oxidation reaction and NOx by reduction reaction as follows:



- Oxidization reaction of CO  

$$\text{CO} + 1/2\text{O}_2 \leftrightarrow \text{CO}_2$$

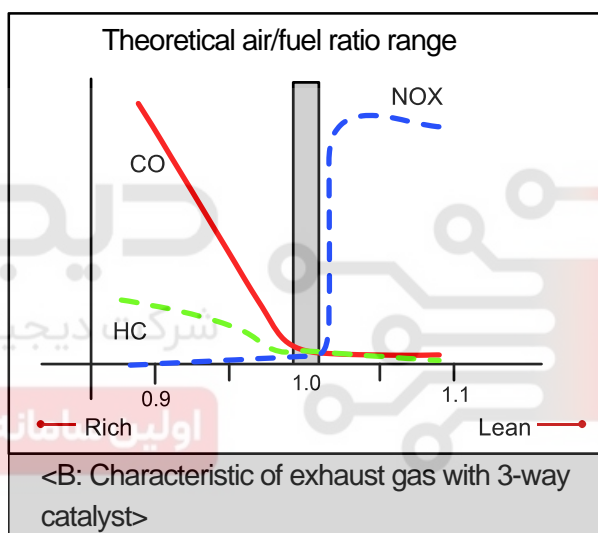
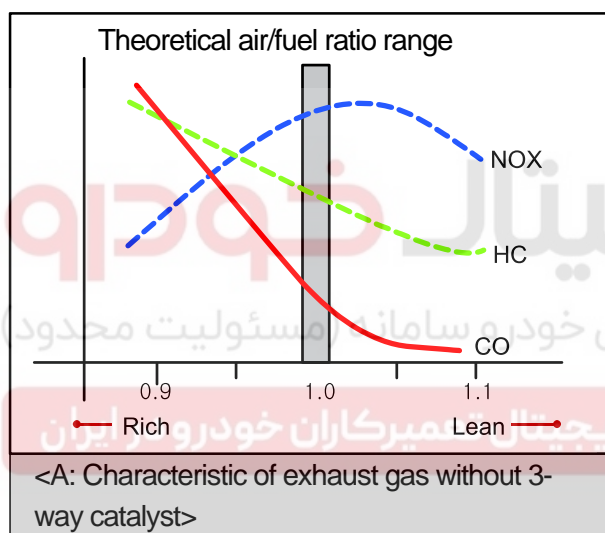
$$\text{CO} + \text{H}_2\text{O} \leftrightarrow \text{CO}_2 + \text{H}_2$$
- Oxidization reaction of HC  

$$\text{HNCM} + 2m\text{H}_2\text{O} \leftrightarrow m\text{CO}_2 + (n/2 + 2m)\text{H}_2\text{O}$$
- Reduction reaction of NO  

$$\text{NO} + \text{CO} \leftrightarrow 1/2\text{N}_2 + \text{CO}_2$$

$$\text{NO} + \text{H}_2 \leftrightarrow 1/2\text{N}_2 + \text{H}_2\text{O}$$

### B. Relation between catalytic converter and air/fuel ratio



$\lambda$  indicates fuel/air mixture ratio.

$\lambda < 1$ : rich mixture ratio,  $\lambda > 1$ : lean mixture ratio

$\lambda = 1$ : perfect combustion ( $\lambda = 1$  indicates mass ratio for air/fuel ratio of 14.7:1)

The graph A shows characteristics of exhaust gas when the catalyst is not operated, while the graph B shows characteristics when the catalyst is operated. As shown in the graph A, lean air/fuel ratio leads to excessive oxygen in the exhaust gas. CO and HC react to  $\text{O}_2$  and are purified as they are changed into  $\text{CO}_2$  and  $\text{H}_2\text{O}$ . On the other hand, NOx does not react to  $\text{O}_2$  due to lack of its oxidizability and is discharged as it is. Also, NOx does not react if the exhaust gas temperature is low. On the other hand,  $\text{O}_2$  is decreased and CO and HC are increased if the mixture ratio is rich. In this case, NOx is reduced to  $\text{CO}_2$ ,  $\text{H}_2\text{O}$  and  $\text{N}_2$ , and HC and CO are discharged as they are. In the graph B, the theoretical air/fuel ratio should be maintained since oxidation and reduction occur in another section. Consequently, combustion should be performed at the theoretical air/fuel ratio (14.7:1) to obtain maximum effect of the 3-way catalyst. Also,  $\text{O}_2$  is decisive of purification rate of hazardous materials and it is determined by air/fuel ratio feedback control of the oxygen sensor.

| Item                     | Lean mixture ratio      | Rich mixture ratio          |
|--------------------------|-------------------------|-----------------------------|
| O <sub>2</sub> condition | Abundant O <sub>2</sub> | Insufficient O <sub>2</sub> |
| NOx condition            | Abundant NOx            | Abundant HC and CO          |
| HC/CO                    | HC and CO are oxidized  | NOx is reduced              |

### C. Relation between catalytic converter and temperature

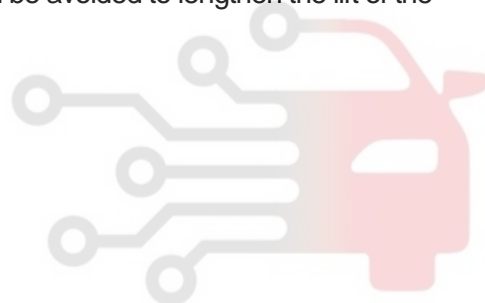
Normal operating temperature is critical to the catalytic converter like the oxygen sensor. The catalytic converter cannot perform its function until its temperature reaches approx. 250°C. Therefore, when the cold engine is started, the engine ECU controls the ignition timing and idling speed so that the catalytic converter can reach its normal temperature quickly.

The ideal temperature of the 3-way catalyst converter is 400 ~ 800°C. In this temperature range, purification rate of the exhaust gas is maximized and life of the converter is extended. If engine disorder, such as misfire, occurs, the converter can be overheated over 1,400°C and the ceramic body can be damaged due to thermal aging, resulting in no effect of the catalytic converter.

Consequently, unleaded gasoline should be used, and factors, which can overheat the catalytic converter, such as abrupt acceleration at idling and misfire, should be avoided to lengthen the life of the catalytic converter and enhance its purification rate.

دیجیتال خودرو  
شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

#### 4) Hazardous emission material characteristics

##### A. Relation with air/fuel mixture ratio

CO and HC increase but NO<sub>x</sub> decreases if mixture ratio is richer than the theoretical mixture ratio.

NO<sub>x</sub> increases but CO and HC decrease if mixture ratio is slightly leaner than the theoretical mixture ratio.

HC increases but CO and NO<sub>x</sub> decrease if mixture ratio is leaner than the theoretical mixture ratio.

##### B. Relation with engine temperature

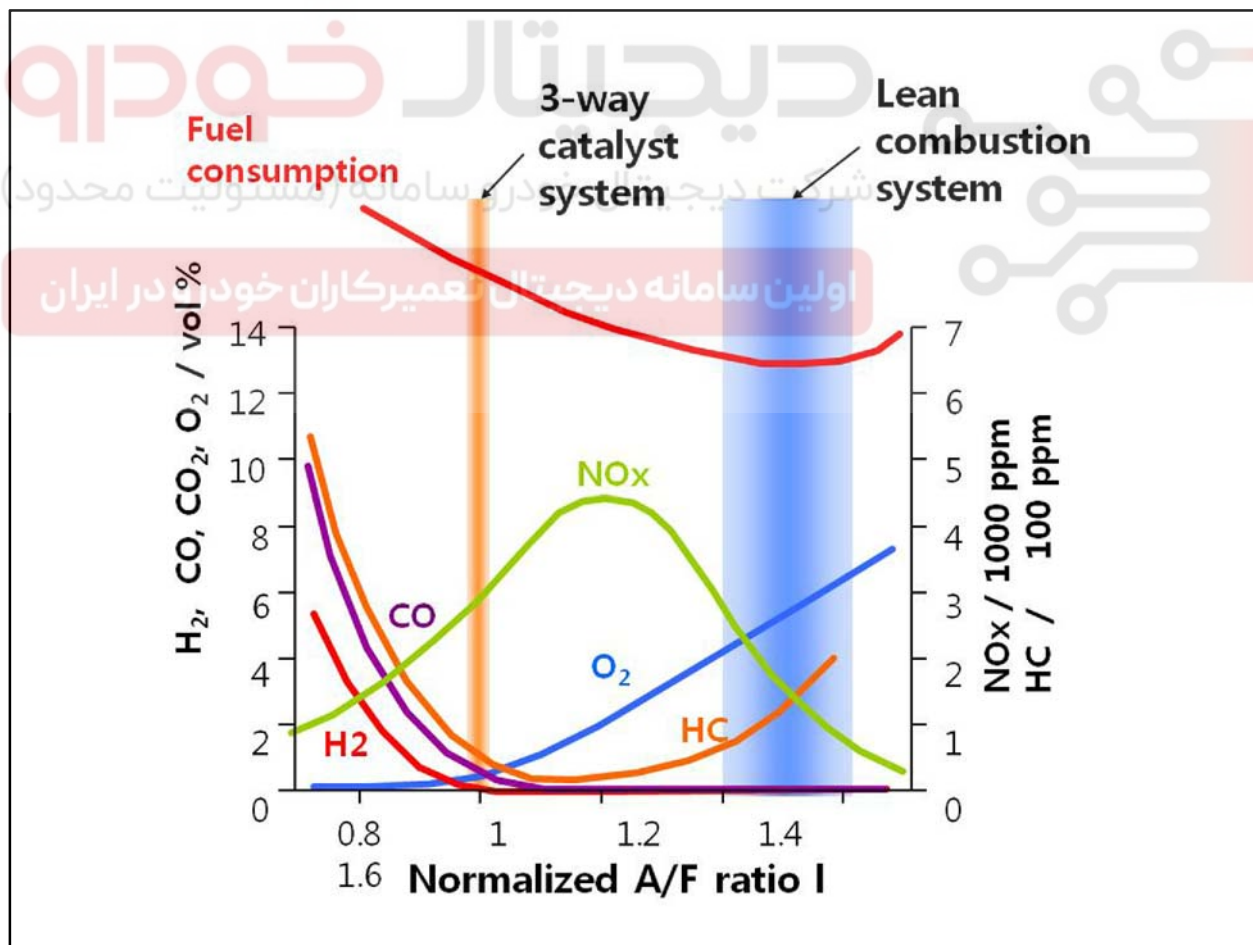
CO and HC increase but NO<sub>x</sub> decreases at low temperature. On the other hand, NO<sub>x</sub> increases but CO and HC decrease at high temperature.

##### C. Relation with driving condition

CO and HC increase but NO<sub>x</sub> decreases at idling.

CO HC and NO<sub>x</sub> increase at acceleration.

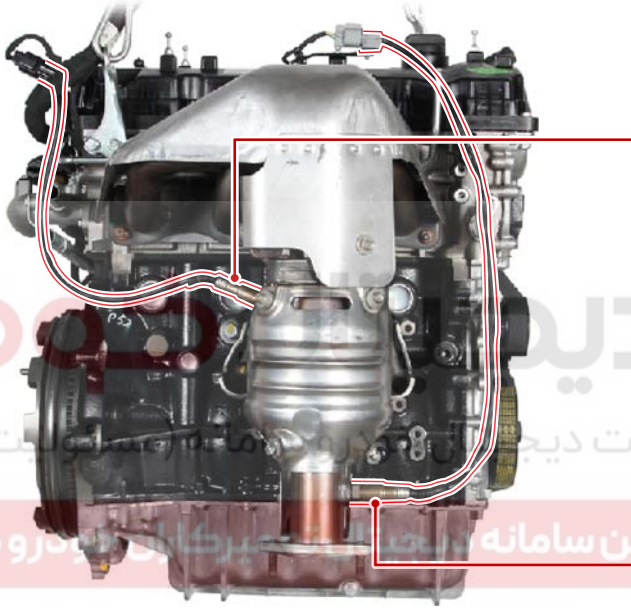
CO HC increase but NO<sub>x</sub> decreases at deceleration.




S.G.N.

**1430-09 OXYGEN SENSOR****1) Overview**


As the emission self-diagnosis system (KDBD regulation) has been installed to inform the driver when emission pollutants exceeds emission standard, the oxygen sensors are installed in front and rear of the catalytic converter (WCC). The oxygen sensors in front of the catalytic converter are to send feedback signals for air/fuel ratio control while the oxygen sensors in rear of the converter are to diagnose the converter and send this status to the ECU.




**Front oxygen sensor**



**Rear oxygen sensor**



**Comparison of front and rear oxygen sensor**



|                            | Length      | Connector color |
|----------------------------|-------------|-----------------|
| <b>Front oxygen sensor</b> | 560 ± 10 mm | Black           |
| <b>Rear oxygen sensor</b>  | 750 ± 10 mm | Gray            |

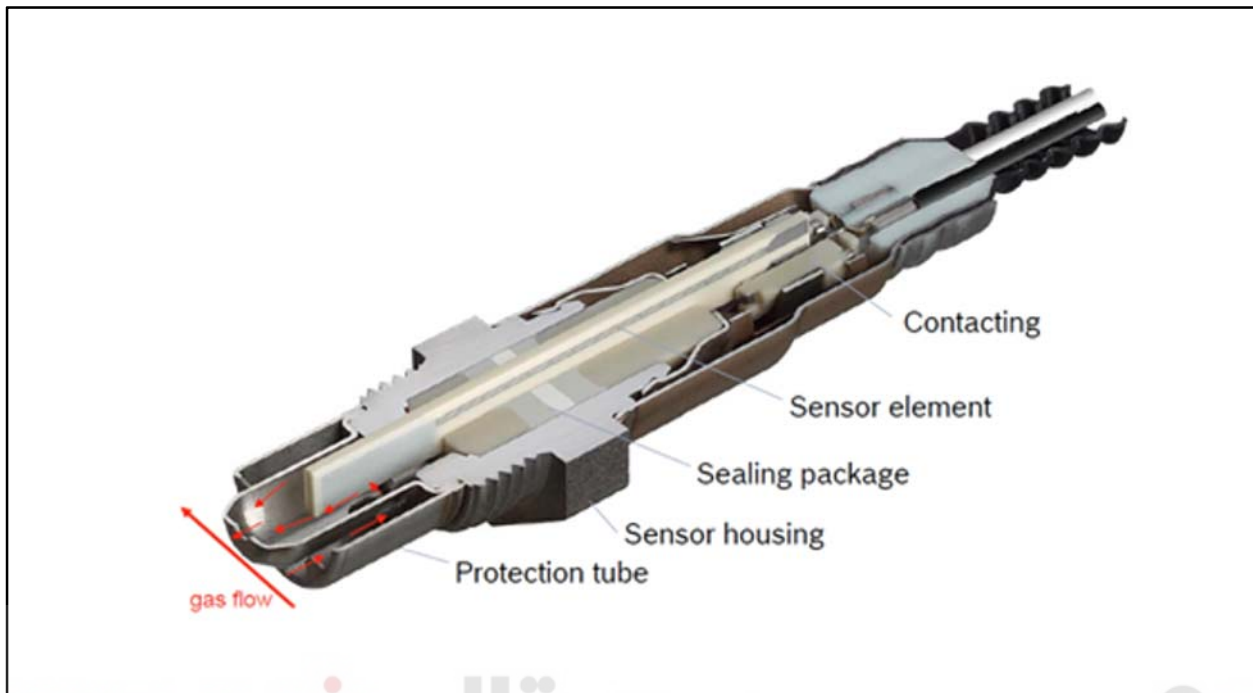
|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

EXHAUST SYSTEM

KORANDO 2013.08



## 2) Features



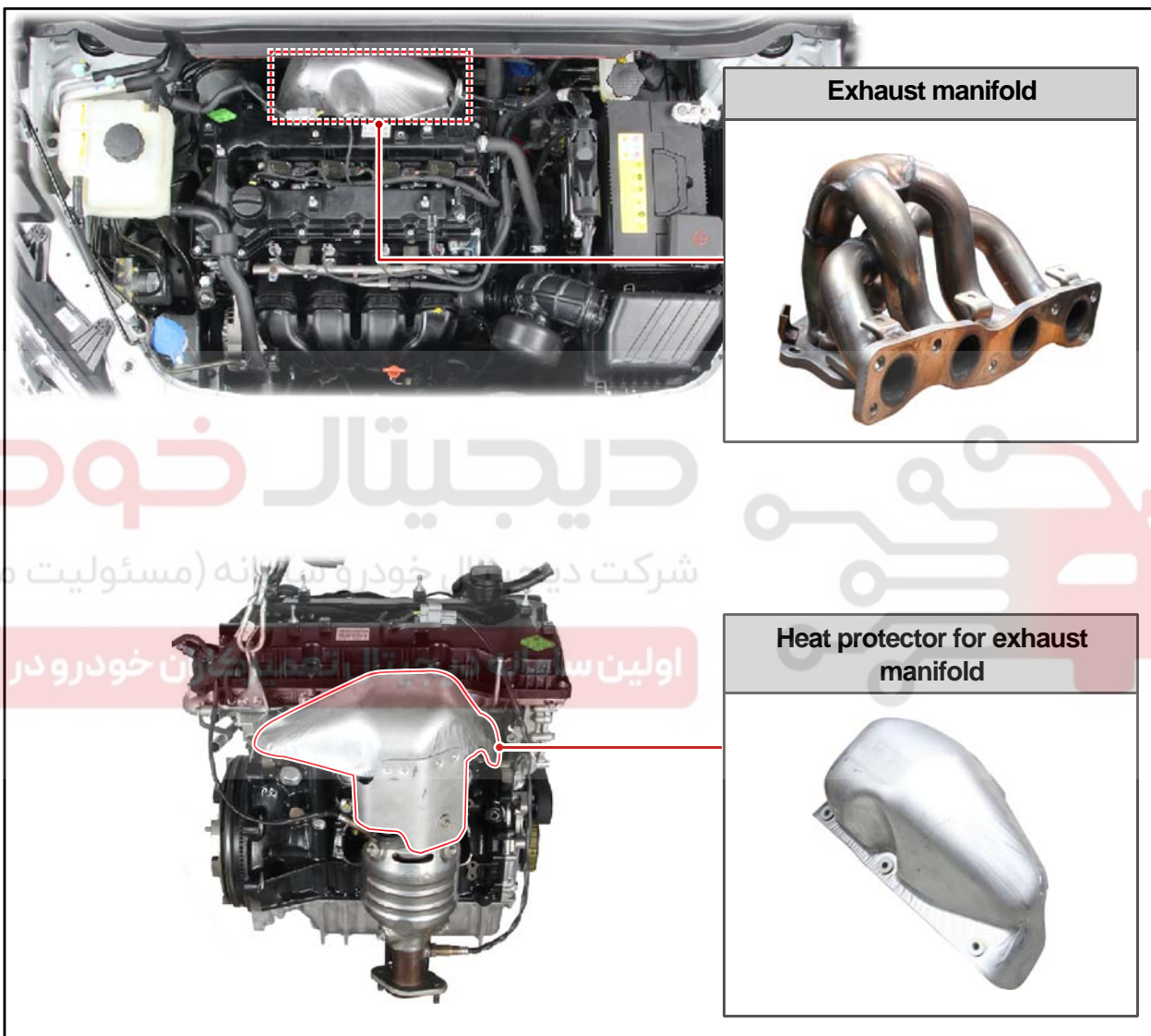
| Description              |                 |            | Specification             |
|--------------------------|-----------------|------------|---------------------------|
| Heater                   | Supply voltage  |            | 13 V                      |
|                          | Current         |            | 0.38 ~ 0.58 A             |
|                          | Resistance      |            | 9 Ω [N]                   |
| Operating temperature    | Exhaust gas     |            | 150 °C ~ 930 °C (1030 °C) |
|                          | Sensor housing  | Continuous | ≤ 600 °C                  |
|                          |                 | Survival   | 650 °C (250h)             |
|                          | Grommet         | Continuous | ≤ 250 °C                  |
|                          |                 | Survival   | 280 °C (50h)              |
|                          | Lead wire       |            | ≤ 250 °C                  |
| Sensor voltage at 350 °C | Rich voltage    |            | ≥ 745 mV                  |
|                          | Lean voltage    |            | 50±30 mV                  |
| Response time at 350 °C  | T2 (Rich->Lean) |            | ≤ 250 ms                  |
|                          | T4 (Lean->Rich) |            | ≤ 100 ms                  |
| Mounting condition       | Type            |            | M18×1.5                   |
|                          | Torque          |            | 40 ~ 60 Nm                |

S.G.N.

## 1745-01 EXHAUST MANIFOLD

## 1) Overview

The exhaust manifold transfers the high temperature and high pressure gas from the engine to WCC (Warmin-up Catalytic Converter). To minimize the interference of exhaust gas, the runner is designed to 4-2-1 type.



Exhaust manifold



Heat protector for exhaust manifold

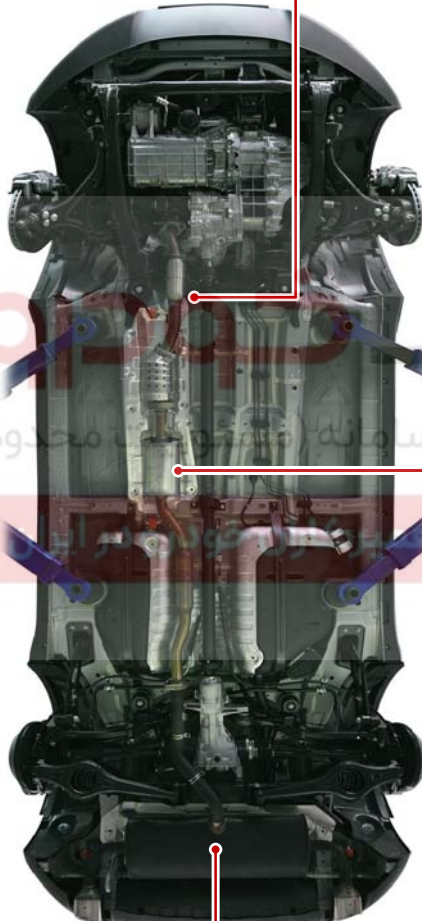
ENGINE  
GENERALENGINE  
ASSEMBLINTAKE  
SYSTEMFUEL  
SYSTEMEXHAUST  
SYSTEMIGNITION  
SYSTEMLUBRICAT  
IONCOOLING  
SYSTEMCHARGE  
SYSTEMSTARTIN  
GCRUISE  
CONTROENGINE  
CONTRO




|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

EXHAUST SYSTEM

KORANDO 2013.08

S.G.N.

**2421-02 MUFFLER ASSEMBLY****1) Overview**


|  |
|--|
| <b>No.1 exhaust pipe</b>   |
|    |
| <b>Front muffler bellows</b>   |
| <ul style="list-style-type: none"> <li>- Protects the exhaust system from deformation caused by relative movement between engine and exhaust system. It also absorbs and dampens the vibration energy. Prevents the deformation of the exhaust system caused</li> <li>- by vibration on a rough road. Compensates the thermal expansion and shrinkage of</li> <li>- the exhaust system.</li> <li>- Absorbs the tolerance for each manufactured part.</li> <li>-</li> </ul> |
| <b>No.2 exhaust pipe</b>   |
|    |
| <b>Front muffler (primary silence)</b>   |
| <ul style="list-style-type: none"> <li>- The major function of this pipe is reducing noise but it also functions as an auxiliary subunit of the primary silencer. The difference between these two silencers is size. There are three types of sub silencer based on the internal structure: Expansion type, Resonator type or Absorption type.</li> </ul>   |
| <b>No.3 exhaust pipe (main muffler)</b>  |
|  <ul style="list-style-type: none"> <li>- Reduces most of the noise and cools down the hot exhaust gas.</li> </ul>   |

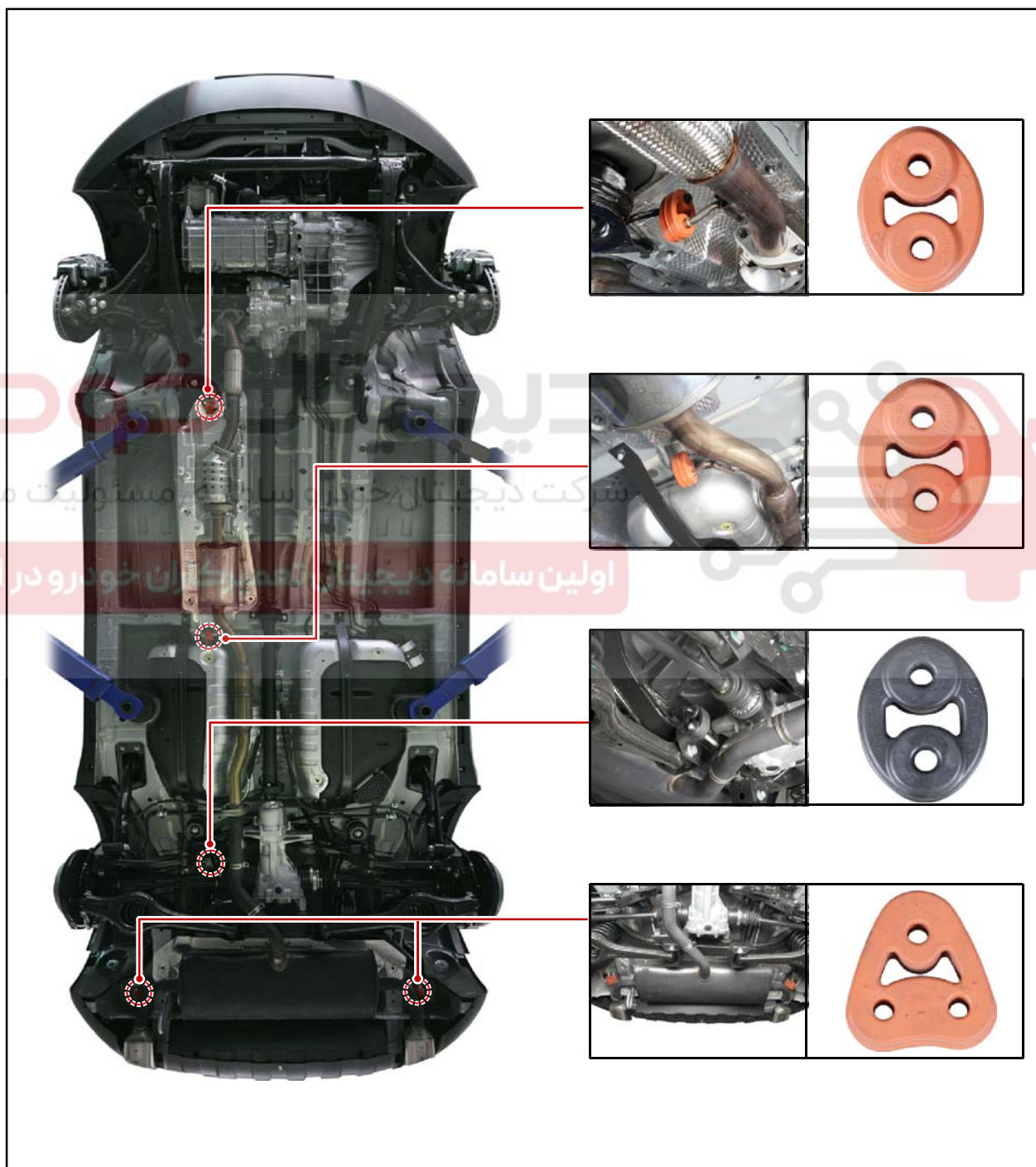


S.G.N.

## 2421-10 HANGER

**⚠ CAUTION**

If the hanger is not properly mounted, vehicle body can vibrate during driving. Make sure that the hangers are not interfered with the vehicle bottom and surrounding components when installing the muffler assembly.



|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

EXHAUST SYSTEM

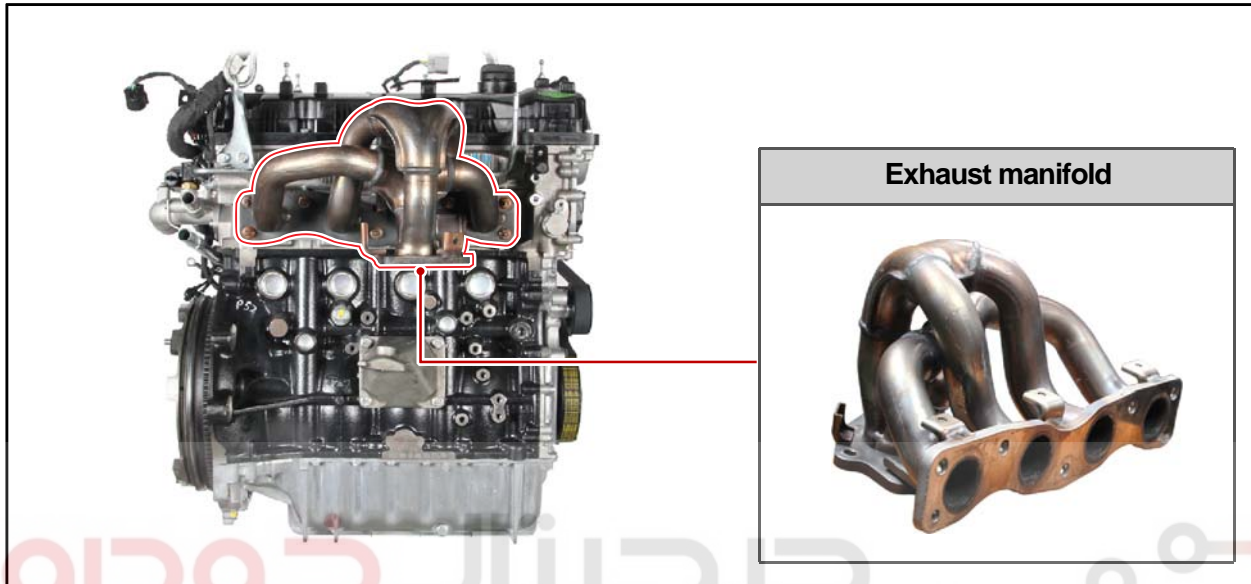
KORANDO 2013.08

## REMOVAL AND INSTALLATION

S.G.N.

## 1745-01 EXHAUST MANIFOLD

**Preceding work** - Disconnect the negative cable from the battery.



1. Disconnect the front oxygen sensor connector and remove it from the connector holder with a remover.



2. Disconnect the rear oxygen sensor connector and remove it from the connector holder with a remover.



EXHAUST SYSTEM

KORANDO 2013.08

|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |





3. Disconnect the engine ECU connector (A).



4. Release the clamp at both sides and remove the blow-by hose.



5. Unscrew two bolts (10 mm) and remove the engine hanger bracket.

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



6. Unscrew the bolt (10 mm) and remove the front oxygen sensor bracket.

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



|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |



7. Unscrew five bolts (10 mm) and remove the heat protector in the sequence below:

**Tightening torque**  $10 \pm 1\text{Nm}$



A. Pull up the heat protector to arrow direction.



B. Move the heat protector to arrow direction.



C. Remove the heat protector while keeping cautious to the acoustic cover lock (arrow).

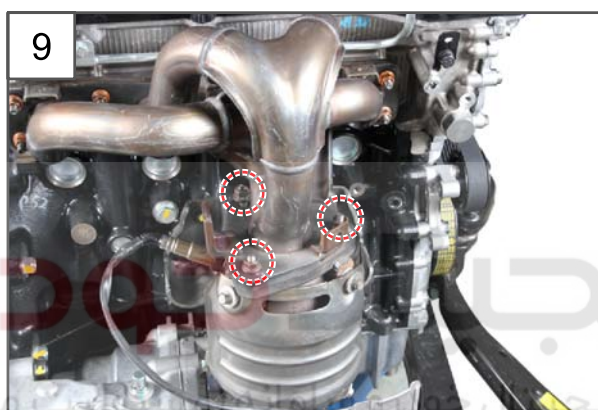






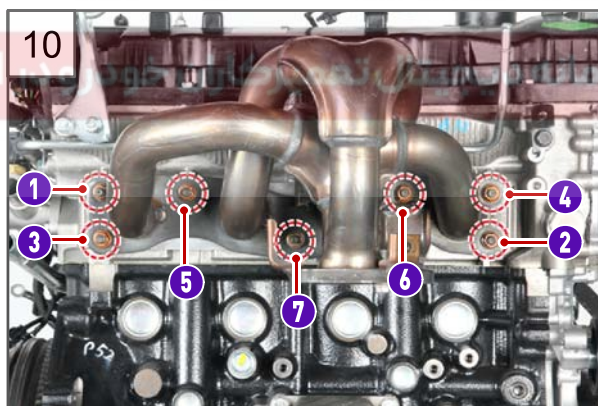
8. Unscrew two lower bolts (14 mm) from the WCC bracket.

**Tightening torque** 46 ~ 54Nm



9. Unscrew three nuts (12 mm) on the exhaust manifold to WCC.

**Tightening torque** 29 ~ 34Nm



10. Unscrew seven nuts (12 mm) in the numerical order in the figure.

**Tightening torque** 40 ± 5Nm



A. Move the exhaust manifold to arrow direction.

|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

05-26

1745-01

korando



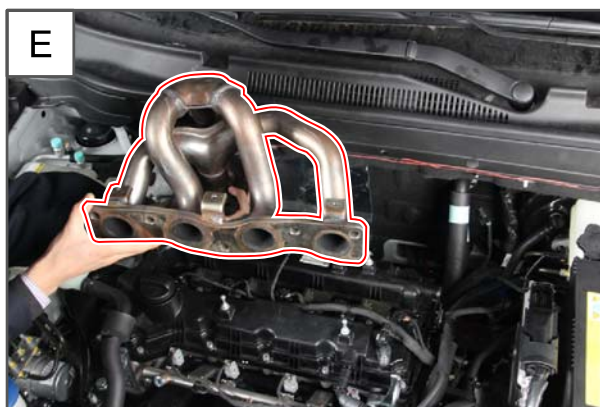
B. Turn off the exhaust manifold so the the mating surface fasce upward.



C. Move the exhaust manifold to arrow direction.



D. Pull out the exhaust manifold as shown in the figure.



E. Remove the exhaust manifold.

## EXHAUST SYSTEM

KORANDO 2013.08

|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

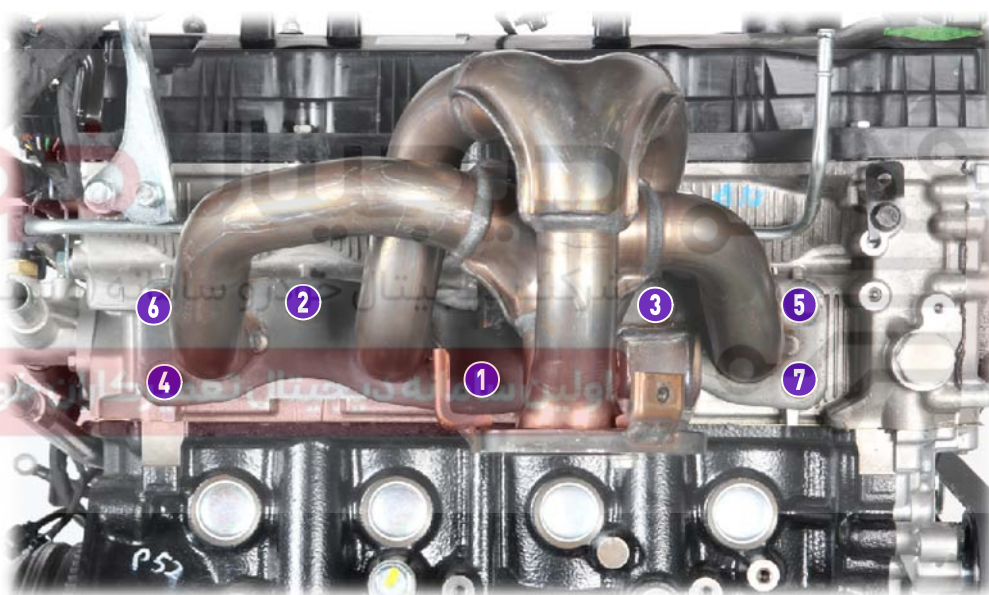


11



11. Install the exhaust manifold in the reverse order of removal.

#### Caution when installing



1 → 2 → 3 → 4 → 5 → 6 → 7

Tighten the nuts in two or more steps.

|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

EXHAUST SYSTEM

KORANDO 2013.08

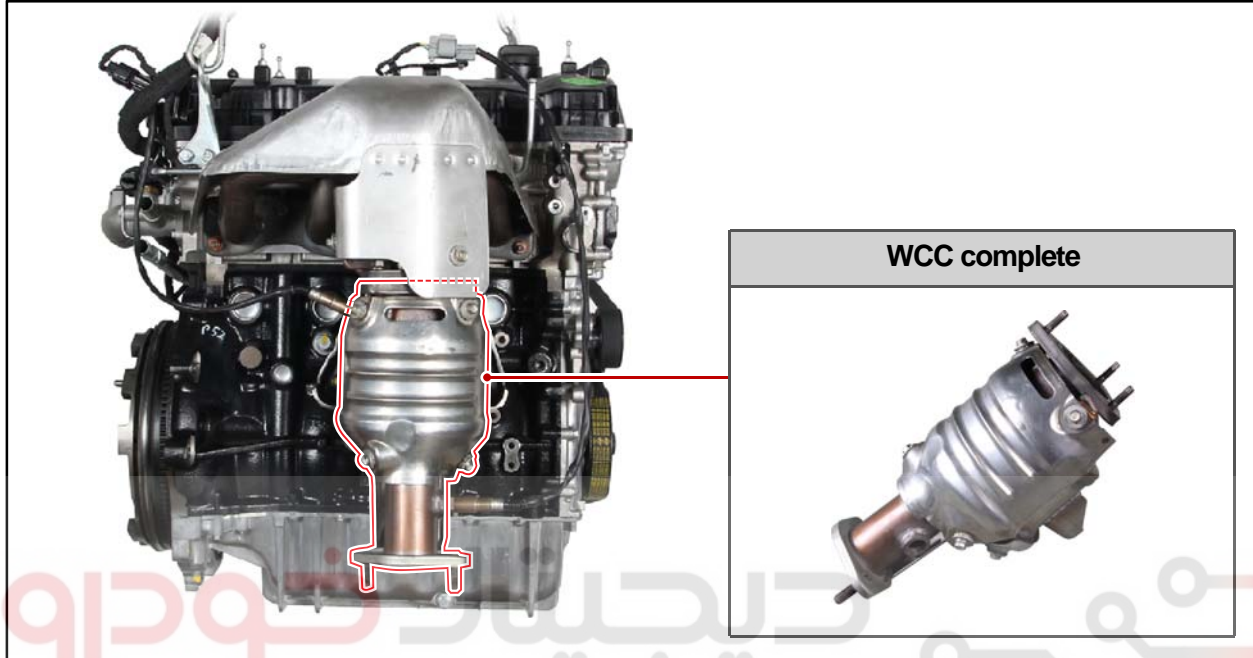
S.G.N.

2421-01

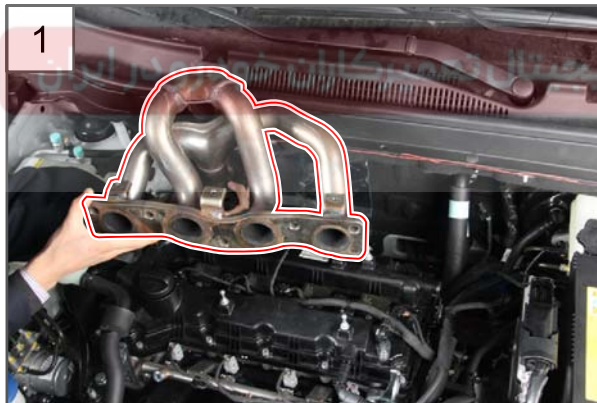
## WCC (WARMING-UP CATALYTIC CONVERTER) COMPLETE

### Preceding work

- Disconnect the negative cable from the battery.



### ► Removal with exhaust manifold



1. Remove the exhaust manifold.

### NOTE

Refer to chapter "Exhaust manifold" in engine.

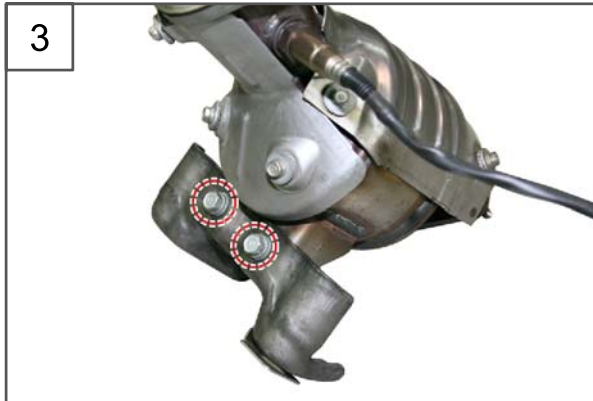


2. Unscrew two nuts (14 mm) on WCC to No.1 exhaust pipe.

**Tightening torque** 34 ~ 37Nm

|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |





3. Unscrew two bolts (14 mm) from the WCC complete bracket.

**Tightening torque** 46 ~ 54Nm



4. Remove the WCC complete.



5. Install the WCC complete in the reverse order of removal.

|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

### ► Removal without exhaust manifold

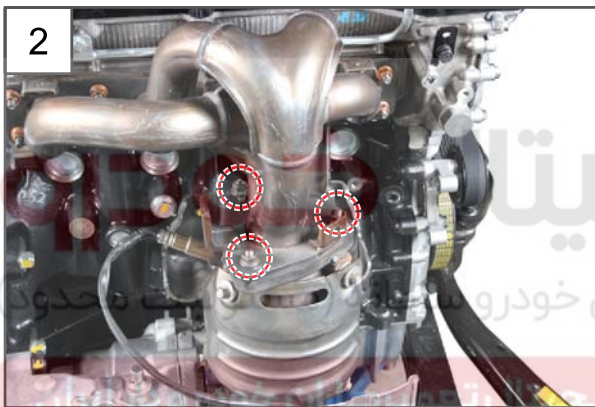
#### Preceding work

- Disconnect the negative cable from the battery.
- Remove the front right tire.



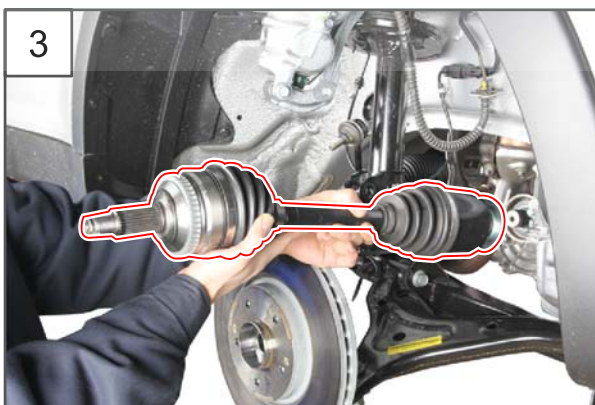
1. Remove the heat protector.

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



2. Unscrew three nuts (12 mm) on the exhaust manifold to WCC complete.

**Tightening torque**  $29 \sim 34\text{Nm}$



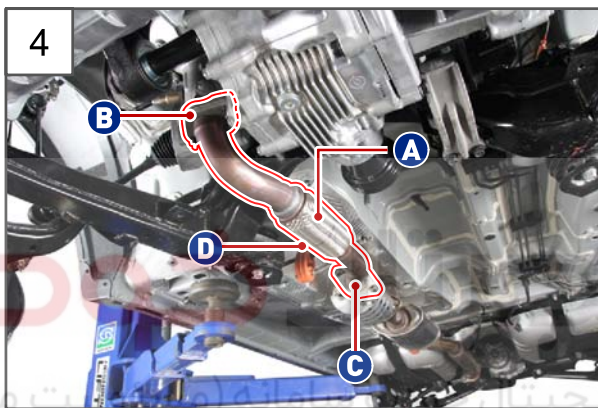
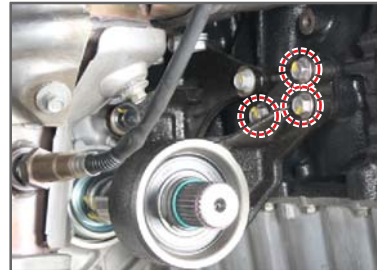
3. Remove the front right drive shaft.

#### ⚠ NOTE

Refer to Chapter "Drive Shaft" in "CHASSIS".

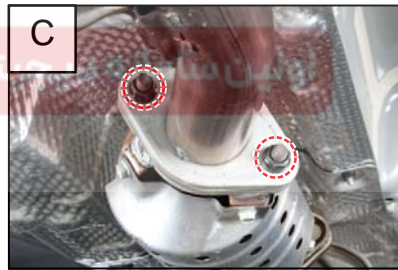
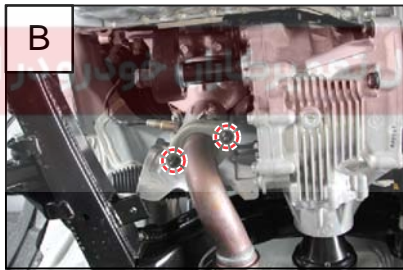


- Unscrew three bolts (14 mm) and remove the intermediate shaft.



4. Remove the No.1 exhaust pipe (A).

- Unscrew nut (B) on exhaust pipe to WCC.
- Unscrew nut (C) on No.1 exhaust pipe to UCC.
- Remove the No.1 exhaust pipe from the hanger (D).



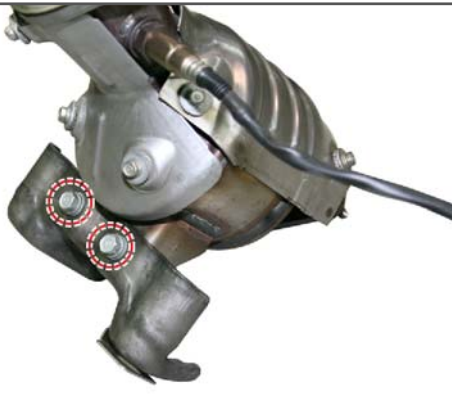
5. Unscrew four bolts (12 mm) and remove the WCC complete with bracket.

**Tightening torque 29 ~ 34Nm**

|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |



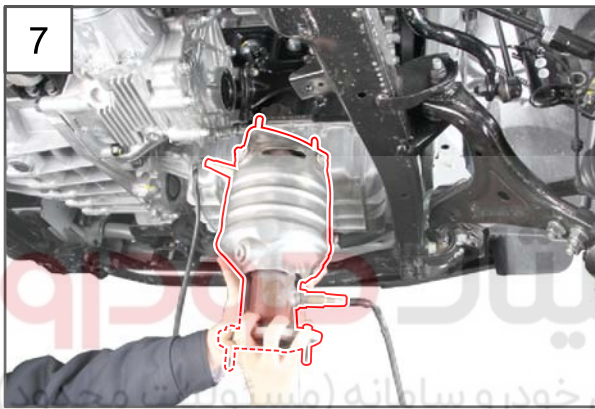
6



6. Unscrew two bolts (12 mm) from the WCC complete.

**Tightening torque** 46 ~ 54Nm

7



7. Remove the WCC complete from the vehicle.

8



8. Install the WCC complete in the reverse order of removal.

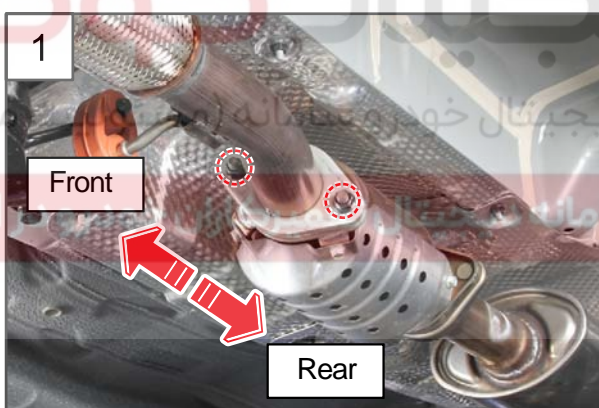
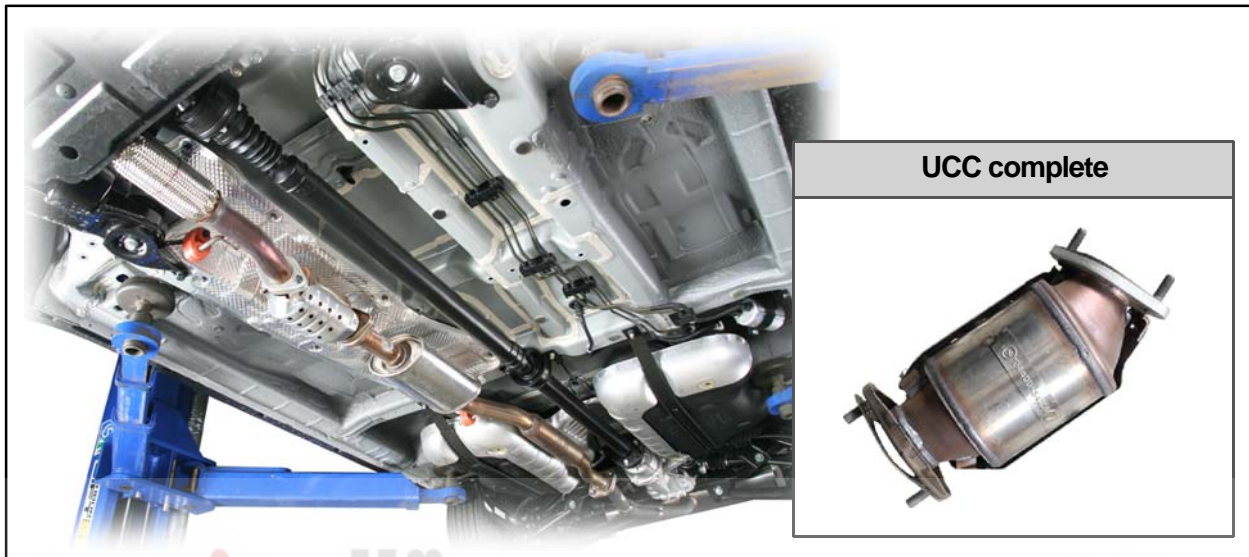
S.G.N.

2421-03

## UCC (UNDERFLOOR CATALYTIC CONVERTER) COMPLETE

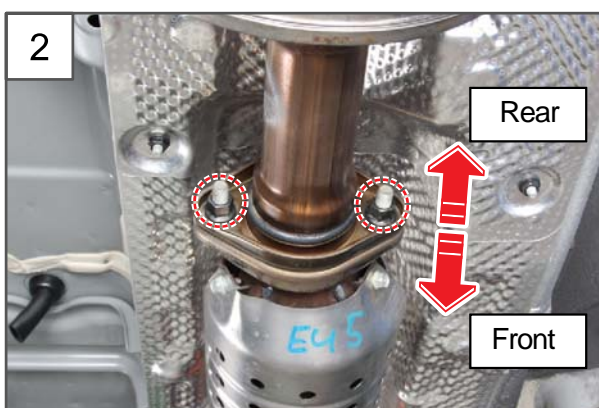
Preceding work

- Disconnect the negative cable from the battery.



1. Unscrew two nuts (14 mm) on the No.1 exhaust pipe to UCC.

**Tightening torque 34 ~ 37Nm**



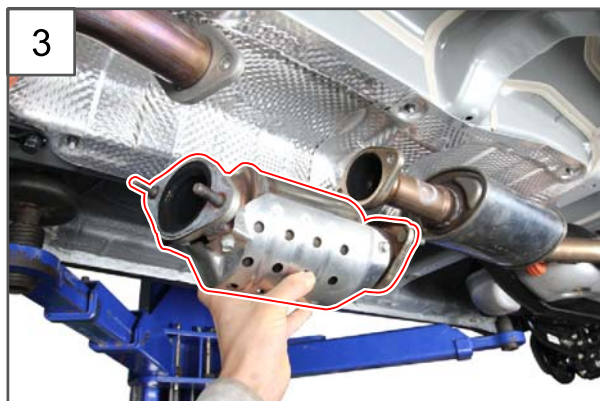
2. Unscrew two nuts (14 mm) on the No.2 exhaust pipe to UCC.

**Tightening torque 34 ~ 37Nm**

|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

EXHAUST SYSTEM

KORANDO 2013.08



3. Remove the UCC complete from the vehicle.



4. Install the UCC complete 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  |  |
| Affected VIN       |  |

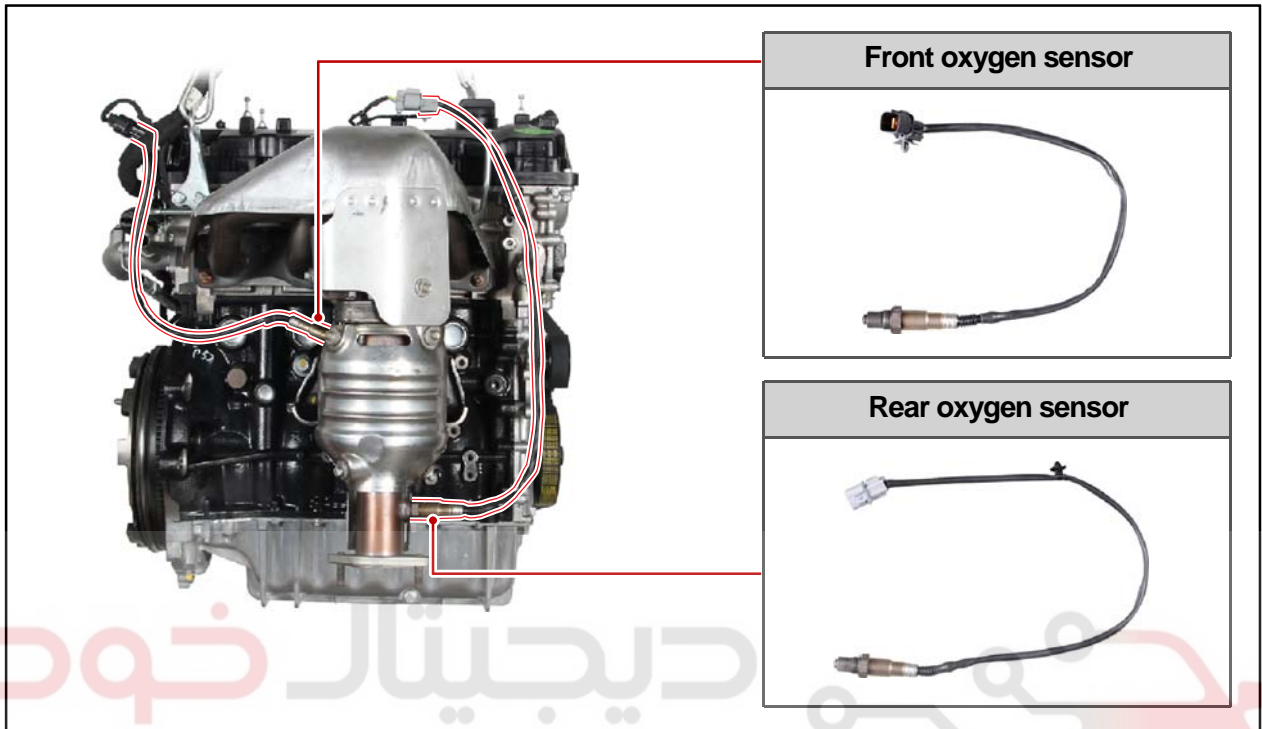


S.G.N.

## 1430-09 OXYGEN SENSOR

Preceding work

- Disconnect the negative cable from the battery.



## ► Front oxygen sensor

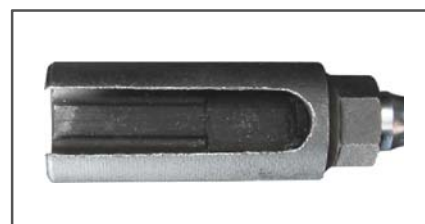


1. Disconnect the front oxygen sensor connector and remove it from the connector holder with a remover.



2. Unscrew the front oxygen sensor with a specified remover.

Tightening torque 40 ~ 60Nm



|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

EXHAUST SYSTEM

KORANDO 2013.08

05-36

1430-09

KORANDO



3. Remove the front oxygen sensor.



4. Install the front oxygen sensor in the reverse order of removal.



|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |



### ► Rear oxygen sensor

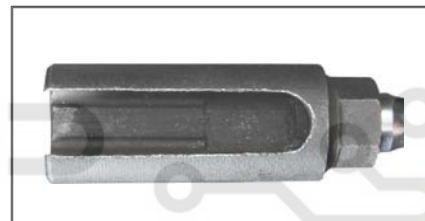


1. Disconnect the rear oxygen sensor connector and remove it from the connector holder with a remover.



2. Unscrew the rear oxygen sensor with a specified remover.

**Tightening torque** 40 ~ 60Nm



3. Remove the rear oxygen sensor.



4. Install the rear oxygen sensor in the reverse order of removal.

|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

05-38

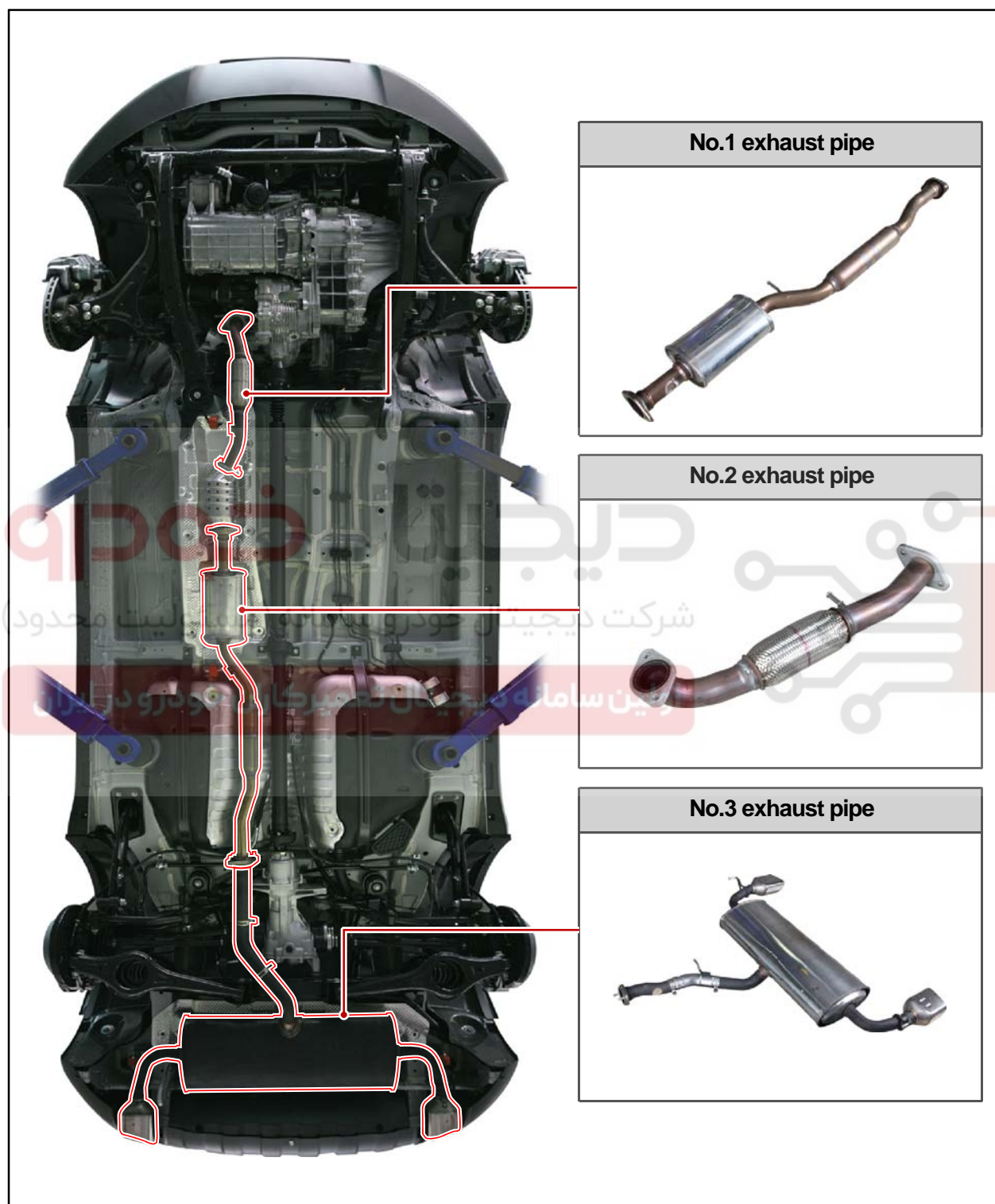
2421-02

KORANDO

S.G.N.

**2421-02 MUFFLER ASSEMBLY****Preceding work**

- Disconnect the negative cable from the battery.



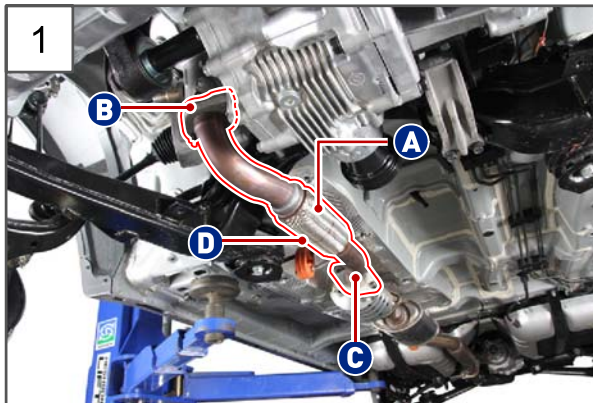
EXHAUST SYSTEM

KORANDO 2013.08

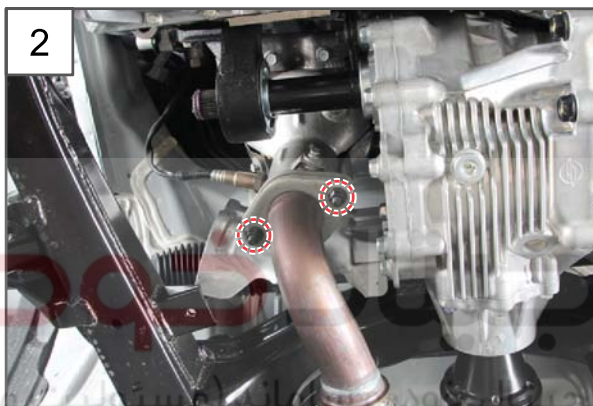
|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |



## ► NO.1 Exhaust pipe



1. Remove the No.1 exhaust pipe (A) in the sequence below:



2. Unscrew the nuts on No.1 exhaust pipe to WCC (B).

**Tightening torque** 34 ~ 37Nm



3. Unscrew the nuts on No.1 exhaust pipe to UCC (C).

**Tightening torque** 34 ~ 37Nm

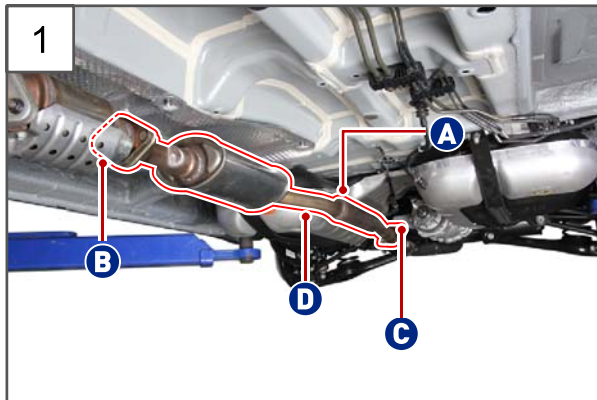


4. Remove the No.1 exhaust pipe from the hanger (D).

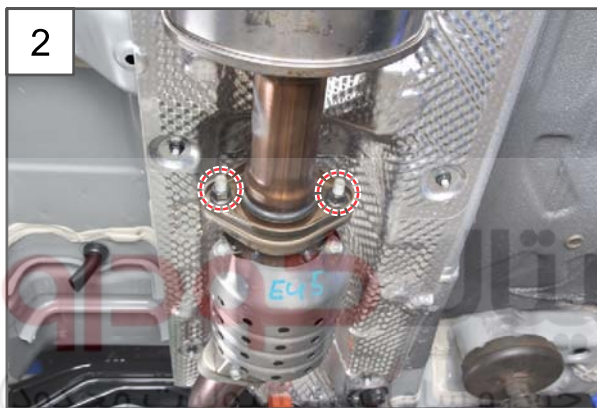
5. Install the No.1 exhaust pipe in the reverse order of removal.

|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

## ► NO.2 Exhaust pipe



1. Remove the No.2 exhaust pipe (A) in the sequence below:



2. Unscrew the nuts on No.2 exhaust pipe to UCC (B).

**Tightening torque** 34 ~ 37Nm



3. Unscrew the nuts on No.2 exhaust pipe to No.3 exhaust pipe (C).

**Tightening torque** 34 ~ 37Nm



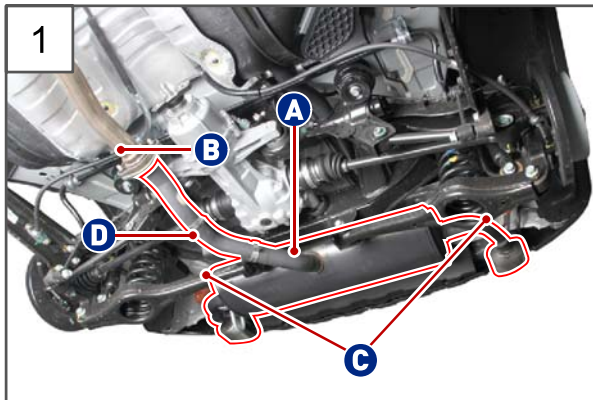
4. Remove the No.2 exhaust pipe from the hanger (D).

5. Install the No.2 exhaust pipe in the reverse order of removal.

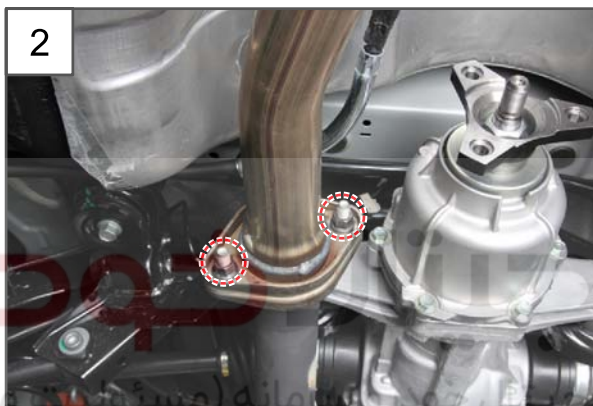
|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |



### ► NO.3 Exhaust pipe (main silence)

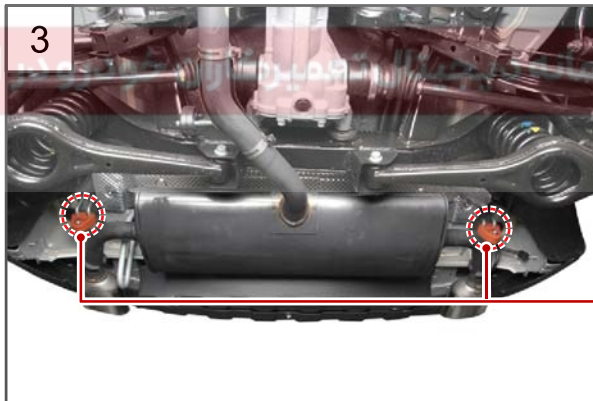


1. Remove the No.3 exhaust pipe (A) in the sequence below:



2. Unscrew the nuts on No.2 exhaust pipe to No.3 exhaust pipe (B).

**Tightening torque** 34 ~ 37Nm



3. Remove the No.3 exhaust pipe from the hanger (C).



5. Install the No.3 exhaust pipe in the reverse order of removal (D).

|                    |  |
|--------------------|--|
| Modification basis |  |
| Application basis  |  |
| Affected VIN       |  |

## Memo

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

