

SQRD4T20 D4T20 INTAKE SYSTEM

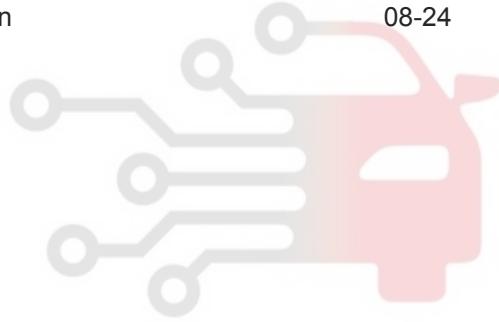
GENERAL INFORMATION	08-3	Electric Throttle Assembly	08-12
Overview	08-3	Removal	08-12
Description	08-3	Cleaning	08-13
Operation	08-5	Installation	08-14
Specifications	08-5	Intake Manifold Assembly	08-15
Tools	08-5	Removal	08-15
Diagnostic Content	08-7	Installation	08-17
Problem Symptoms Table	08-7	Electronic Accelerator Pedal	08-18
Air Filter Element	08-8	Removal	08-18
Replace	08-8	Installation	08-18
Installation	08-8	Intercooler Assembly	08-19
Air Filter Assembly	08-9	Removal	08-19
Removal	08-9	Installation	08-20
Installation	08-9	Intercooler Intake Pipe Assembly	08-21
Remove the hose assembly	08-10	Removal	08-21
Removal	08-10	Intercooler Outlet Pipe	08-23
Installation	08-11	Removal	08-23
		Installation	08-24

08

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



08

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

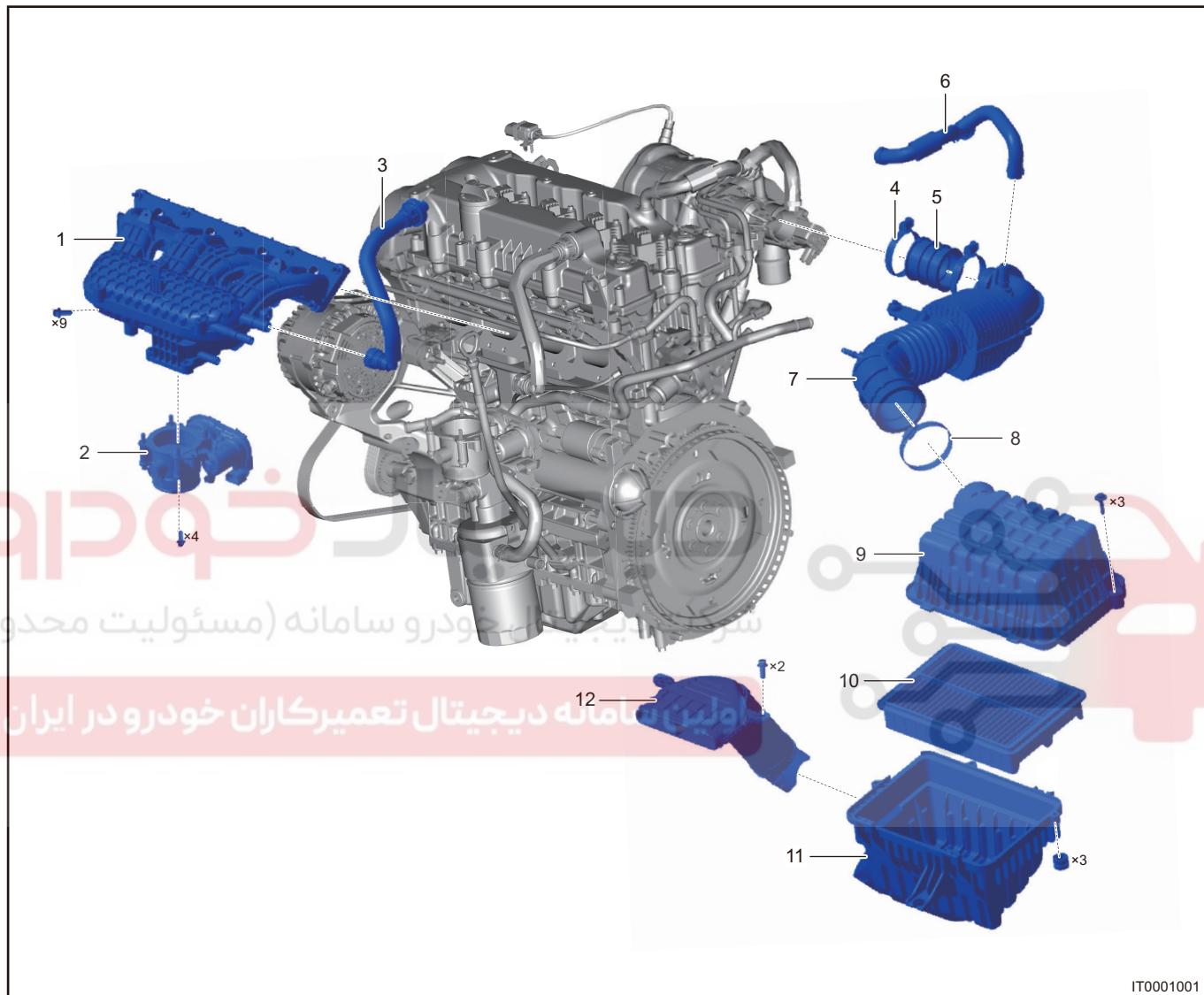
اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



GENERAL INFORMATION

Overview

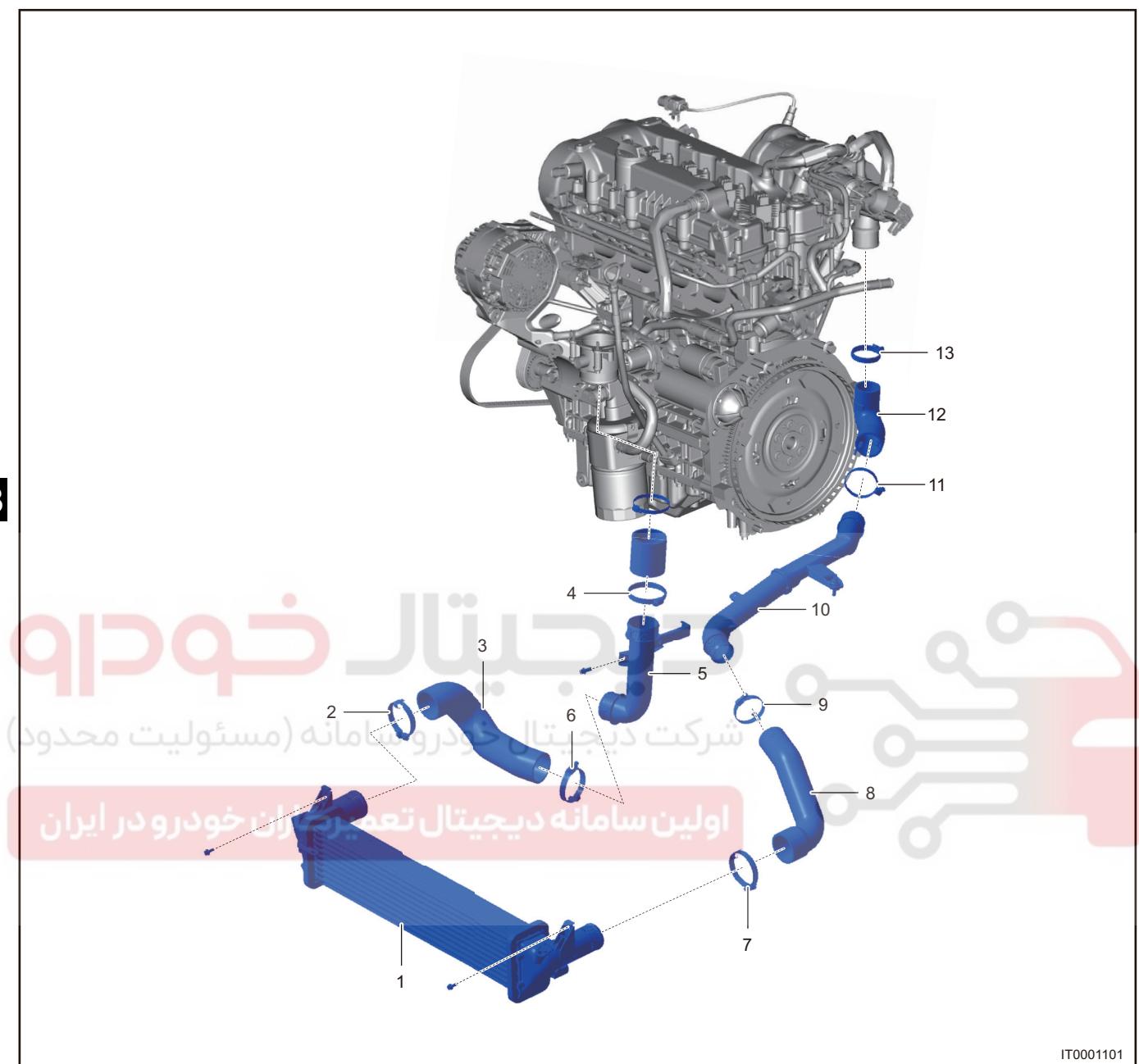
Description



IT0001001

1 - Intake Manifold Assembly	2 - Electronic Throttle
3 - Crankcase Ventilation Box Outlet Pipe	4 - Worm Clamp
5 - Intake Hose Front Pipe	6 - Crankcase Ventilation Box Intake Pipe
7 - Intake Hose Assembly	8 - Worm Clamp
9 - Air Filter Upper Housing	10 - Air Filter Element Assembly
11 - Air Filter Lower Housing	12 - Air Direct Pipe Assembly

08



IT0001101

1 - Intercooler Assembly	2 - Worm Clamp
3 - Intercooler Outlet Pipe Assembly I	4 - Worm Clamp
5 - Intercooler Outlet Pipe Assembly II	6 - Worm Clamp
7 - Worm Clamp	8 - Intercooler Outlet Pipe Assembly III
9 - Worm Clamp	10 - Intercooler Intake Pipe Assembly II
11 - Worm Clamp	12 - Intercooler Intake Pipe Assembly I
13 - Worm Clamp	

Operation

Intake system uses air filter to remove particulates and dust in the air, after boosted by turbocharger, and then the filtered air flows into intake manifold assembly through electronic throttle assembly, the air is cooled and heated by an intercooler installed inside the intake manifold while flowing into intake manifold, and mixes with fuel at the end of intake manifold assembly port to form flammable gas mixture, which is transmitted to each cylinder uniformly to coordinate with engine operation. Electronic throttle assembly is a critical part for engine intake system. Its main function is to control intake air volume by adjusting intake passage area according to driver's driving intention to meet intake requirements in different engine operating conditions, and send back position signals of throttle valve plate to control unit to achieve accurate control and run the engine under optimal control state.

Specifications

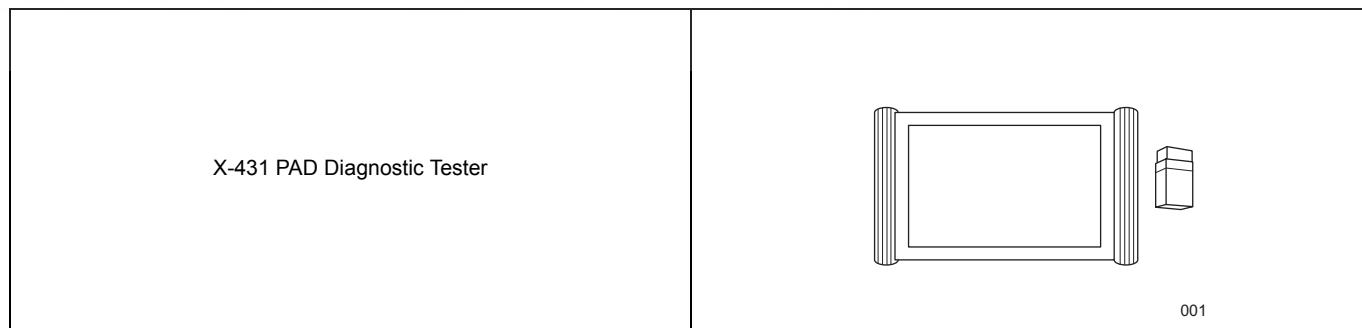
Torque specifications

Description	Torque (N·m)
Coupling Screw Between Air Filter Upper Housing and Lower Housing	1.3 ± 0.2
Air Filter Assembly Fixing Bolt	7 ± 1
Air Direct Pipe Assembly Fixing Bolt	7 ± 1
Intake Hose Fixing Clamp	3.5 ± 0.5
Intercooler Intake Pipe Fixing Clamp	5 ± 1
Intercooler Outlet Pipe Fixing Clamp	5 ± 1
Coupling Bolt Between Intercooler Outlet Pipe Assembly II and Intercooler Intake Pipe Assembly II	5 ± 1
Fixing Bolt Between Intercooler Intake Pipe Assembly II and Transmission	9 ± 1.5
Electronic Throttle Assembly Fixing Bolt	8 ± 3
Electronic Accelerator Pedal Fixing Bolt	9 ± 1.5
Intake Manifold Fixing Bolt	20 ± 5

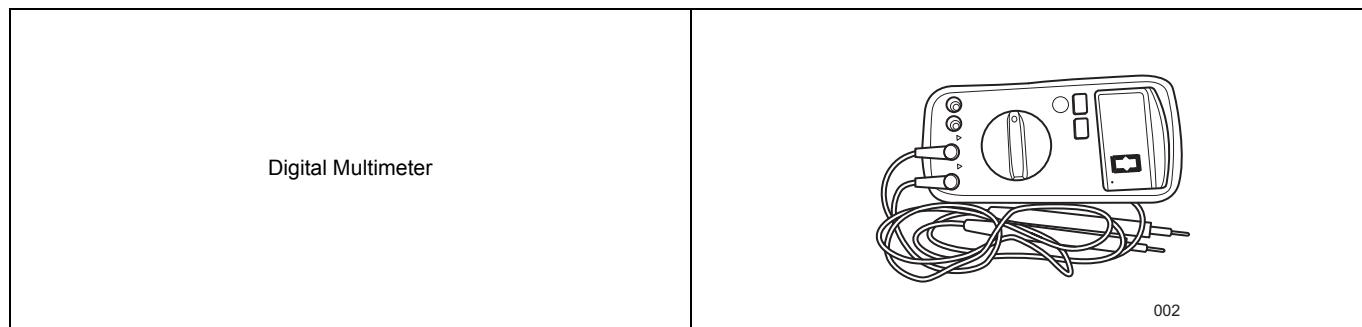
08

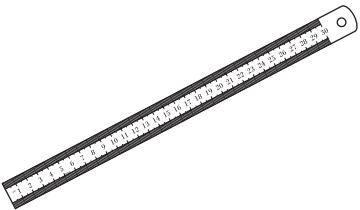
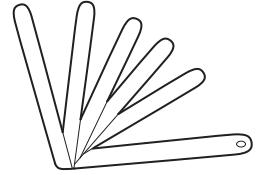
Tools

Special Tool



General Tools



Precision Straightedge	 RCH0063006
Feeler Gauge	 RCH0060006

08

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



Diagnostic Content

Problem Symptoms Table

Hint:

Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair, replace or adjust faulty components as necessary.

Symptom	Possible Cause
Engine idles roughly	Electronic throttle assembly (dirty)
	Intake manifold assembly (broken, leaked)
	Activated charcoal canister solenoid valve (remains on)
	Intake pressure/temperature sensor
	Throttle gasket (damaged)
	Fuel rail injector assembly (installed incorrectly)

08

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



Air Filter Element

Replace

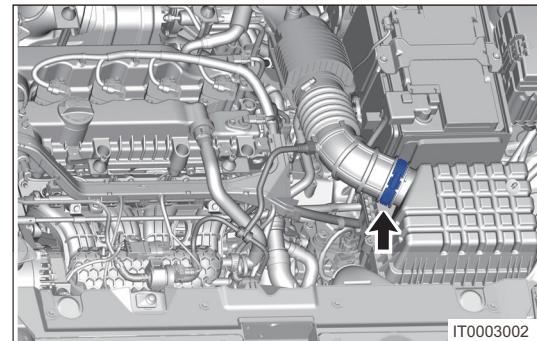
Warning/Caution/Hint

Caution:

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

1. Turn off all electrical equipment and the ENGINE START STOP switch.
2. Remove the front compartment trim cover assembly (if equipped).
3. Disconnect the negative battery cable.
4. Remove the air filter element.
 - (a) Loosen worm clamp (arrow) and disconnect connection between air filter and intake hose.

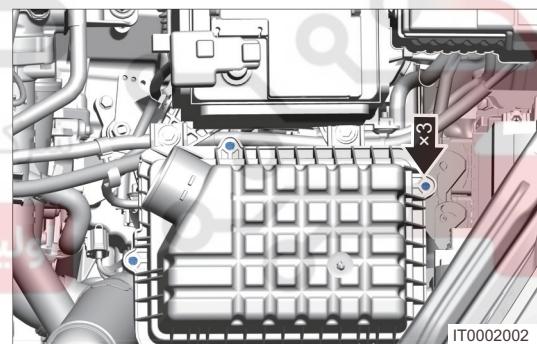
08



- (b) Remove 3 fixing screws (arrow) between air filter upper housing and lower housing.

Tightening torque

$1.3 \pm 0.2 \text{ N}\cdot\text{m}$



- (c) Remove the air filter upper housing and air filter element.

Installation

1. Clean the air filter upper housing and lower housing.
2. Install a new air filter element.
3. Other installation procedures are in the reverse order of removal.

Warning:

- Wasted air filter element should be handled by the specialized department according to local laws and regulations. Never discard it at will.

Air Filter Assembly

Removal

Warning/Caution/Hint

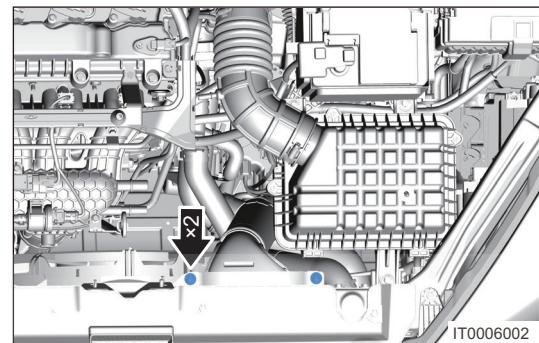
Caution:

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

1. Turn off all electrical equipment and the ENGINE START STOP switch. Wait until engine cools down.
2. Remove the front compartment trim cover assembly (if equipped).
3. Disconnect the negative battery cable.
4. Remove the air filter with air direct pipe assembly.
 - (a) Remove 2 fixing bolts (arrow) from air direct pipe.

Tightening torque

$7 \pm 1 \text{ N}\cdot\text{m}$

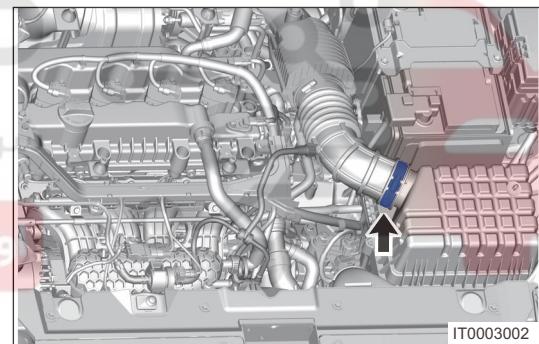


08

- (b) Loosen worm clamp (arrow) and disconnect connection between air filter and intake hose I.

Tightening torque

$3 \pm 0.5 \text{ N}\cdot\text{m}$

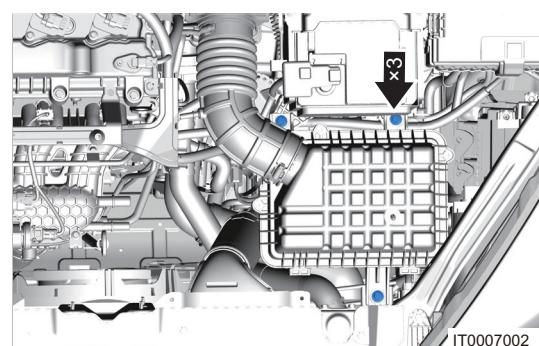


ولین سامانه دیجیتال تعمیرکاران خودرو در ایران

- (c) Remove 3 fixing bolts (arrow) from air filter assembly.

Tightening torque

$7 \pm 1 \text{ N}\cdot\text{m}$



- (d) Remove the air filter with intake hose assembly.

Installation

1. Installation is in the reverse order of removal.

Caution:

- Check for foreign matter in air filter and hose when installing. Avoid inhaling foreign matter after engine running, causing damage to the components.

Remove the hose assembly

Removal

Warning/Caution/Hint

Caution:

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

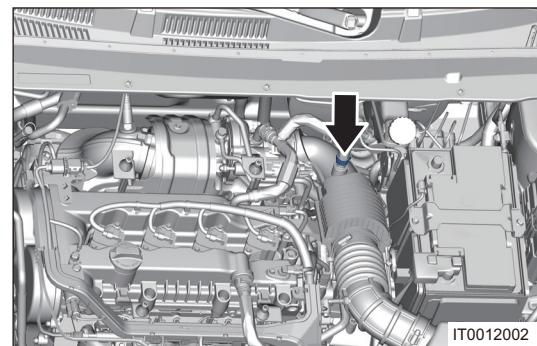
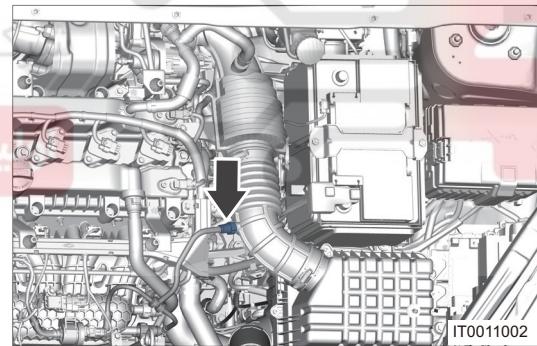
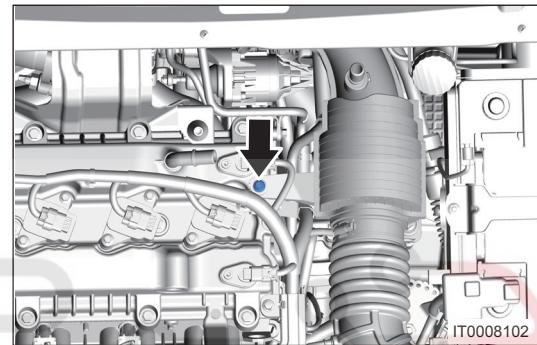
1. Turn off all electrical equipment and the ignition switch.
2. Remove the front compartment trim cover assembly.
3. Remove the engine trim cover.
4. Disconnect the negative battery cable.
5. Remove the battery assembly.
6. Remove the intake hose assembly.
 - (a) Remove fixing bolt from intake hose assembly.

08

دیجیتال خودرو

تعمیر خودرو (محدود)

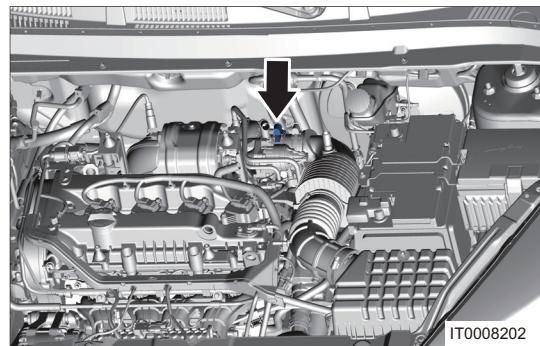
بن سامانه دیجیتال تعمیرکاران خودرو در ایران



(d) Loosen worm clamp (arrow) and disconnect connection between intake hose assembly and turbocharger.

Tightening torque

$3.5 \pm 0.5 \text{ N}\cdot\text{m}$



(e) Remove the intake hose assembly.

Installation

1. Installation is in the reverse order of removal.

08

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



Electric Throttle Assembly

Removal

Warning/Caution/Hint

Caution:

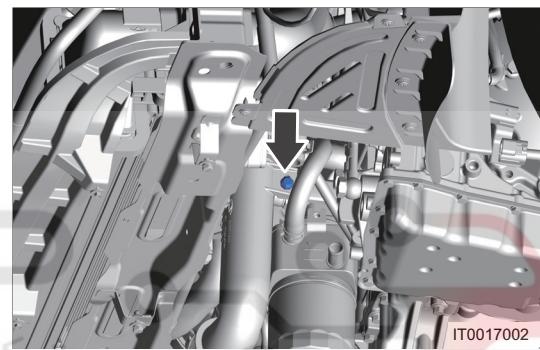
- Temperature in engine compartment is very high when engine is running. Before removal, you must make sure that engine has shut off, and engine compartment has cooled down sufficiently, otherwise, there is a risk of scald injury.
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

- Turn off all electrical equipment and the ENGINE START STOP switch.
- Remove the front compartment trim cover assembly.
- Disconnect the negative battery cable.
- Remove the engine trim cover (if equipped).
- Remove the electronic throttle assembly.

(a) Remove fixing bolt (arrow) from intercooler outlet pipe II.

Tightening torque

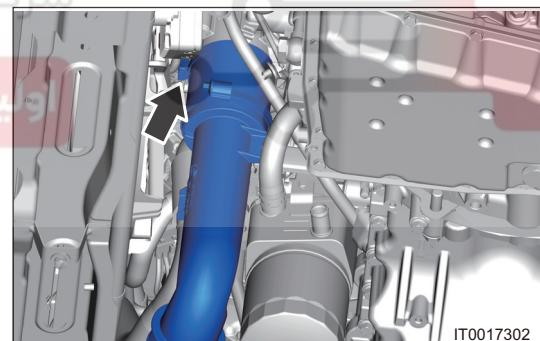
$3.5 \pm 0.5 \text{ N}\cdot\text{m}$



(b) Loosen worm clamp (arrow) and disconnect connection between throttle and intercooler outlet pipe II.

Tightening torque

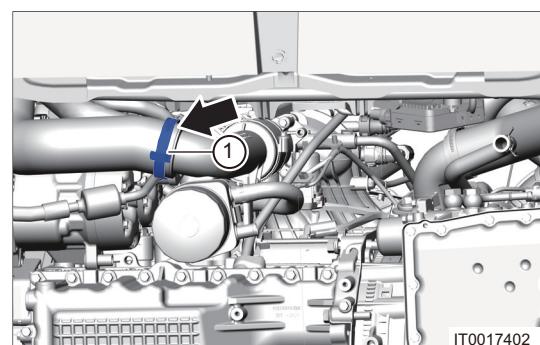
$3.5 \pm 0.5 \text{ N}\cdot\text{m}$



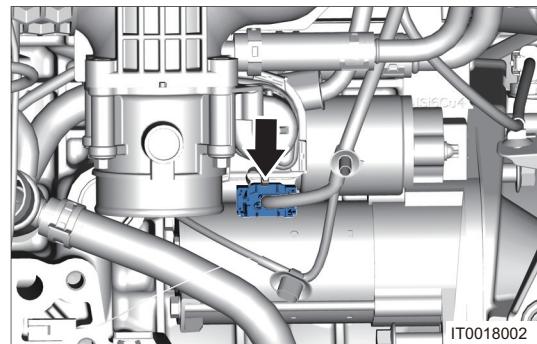
(c) Loosen worm clamp (arrow) and disconnect connection between intercooler outlet pipe I and intercooler outlet pipe II, remove intercooler outlet pipe II assembly (1).

Tightening torque

$3.5 \pm 0.5 \text{ N}\cdot\text{m}$



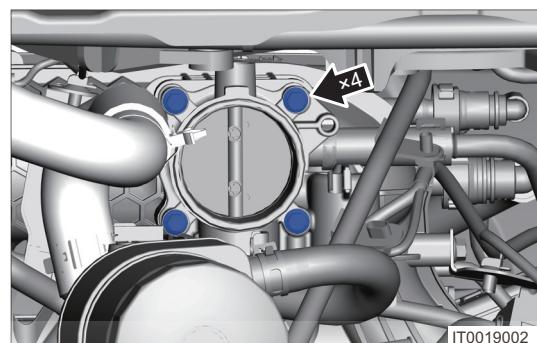
(d) Disconnect the electronic throttle connector (arrow).



(e) Remove 4 fixing bolts (arrow) from electronic throttle.

Tightening torque

8 + 3 N·m

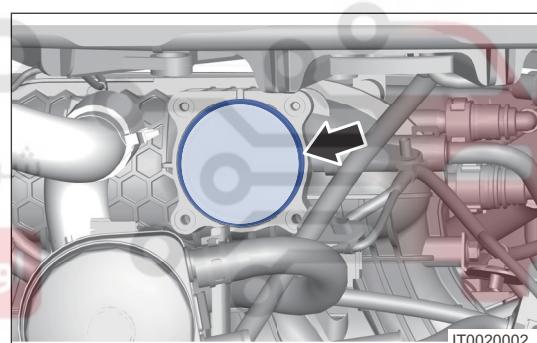


(f) Remove the electronic throttle assembly.

(g) Remove electronic throttle gasket (arrow) from intake manifold.

Caution:

- After removing electronic throttle assembly, block intake manifold intake port with suitable blocking pieces to prevent foreign matter from entering, causing damage to the components.



Cleaning

1. Cleaning Tool

- Thin stick: used to support throttle valve plate for cleaning the carbon deposited on contact wall between valve plate and throttle. Please use plastic, wooden or bamboo thin stick. Do not use metal thin stick to avoid scratching or deforming the valve plate.
- Clean cloth or paper towel.

2. Cleaning Process

- Remove electronic throttle assembly, and make the valve plate face upward in free condition. Avoid cleaner flowing into electronic element through valve plate shaft, resulting in functional failure.
- Apply appropriate amount of cleaner to the inner wall of throttle valve body, and wipe off the carbon with clean cloth.

(c) Support the throttle valve plate with a thin stick, and clean the carbon on valve plate and throttle valve body inner wall.



(d) Turn over the throttle 180°, and clean with the same procedures as above. Repeat several times until it is clean.
(e) Push the valve plate by hand, and check if it rotates smoothly. If it is stuck, clean again according to the cleaning procedures.
(f) After cleaning, wipe off the cleaner in throttle valve body with absorbent paper.

Warning:

- Cleaner is a kind of flammable and corrosive fluid. Follow safety cautions to prevent accidents, and avoid skin contacting with cleaner.
- Pay attention to that the amount of cleaner should not be too much, so as to overflows into sensor and motor, resulting in functional failure.

08

Installation

Warning/Caution/Hint

Caution:

- Clean fitting surface of electronic throttle assembly.
- Perform throttle self-learning procedures after installation. After self-learning is completed, start the vehicle and check for proper operation.

1. Installation is in the reverse order of removal.

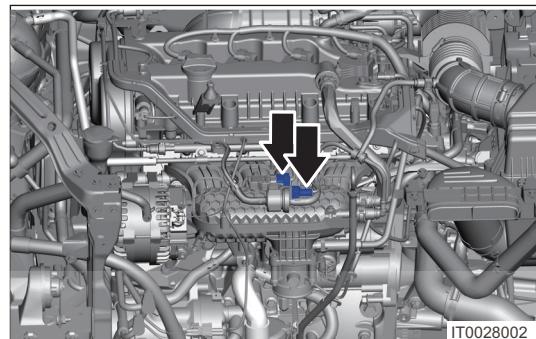
اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



Intake Manifold Assembly

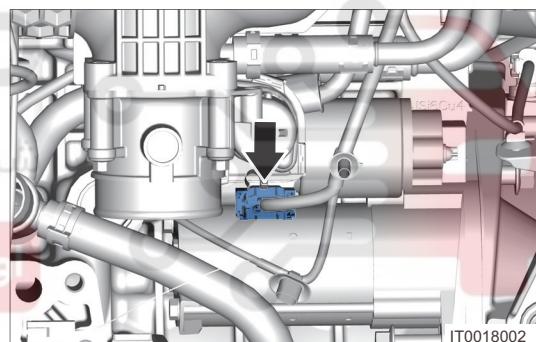
Removal

1. Turn off all electrical equipment and the ENGINE START STOP switch.
2. Remove the front compartment trim cover assembly.
3. Disconnect the negative battery cable.
4. Remove the engine hood cover assembly.
5. Remove the air filter assembly.
6. Remove the intake hose assembly.
7. Remove the intake manifold assembly.
 - (a) Disconnect intake pressure/temperature sensor connector (arrow) and charcoal canister connector (arrow).



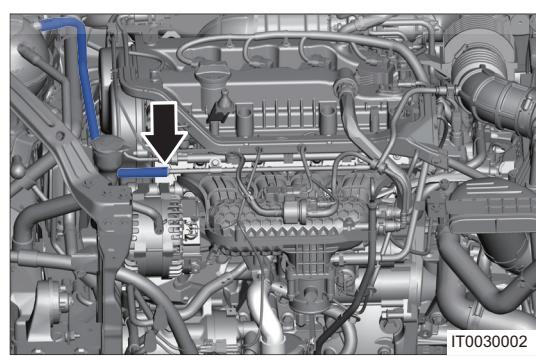
08

- (b) Disconnect the electronic throttle connector (arrow).

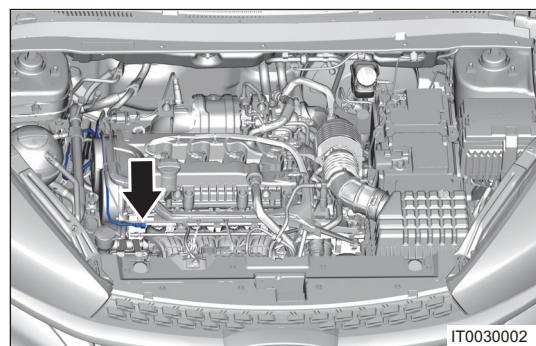


اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

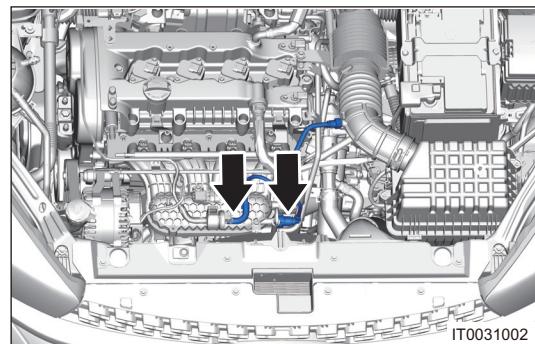
- (c) Disconnect coupling clamp between expansion tank and engine, and pull out water pipe (arrow).



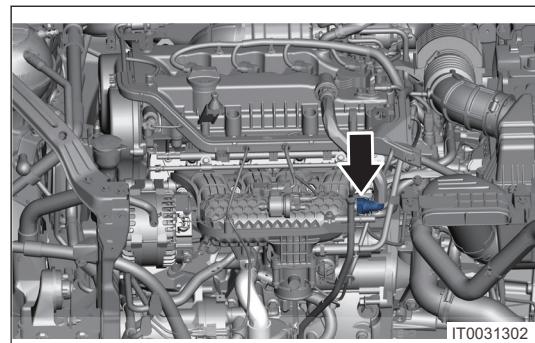
- (d) Disconnect clip (arrow) from intake pipe II, and pull out intake pipe II.



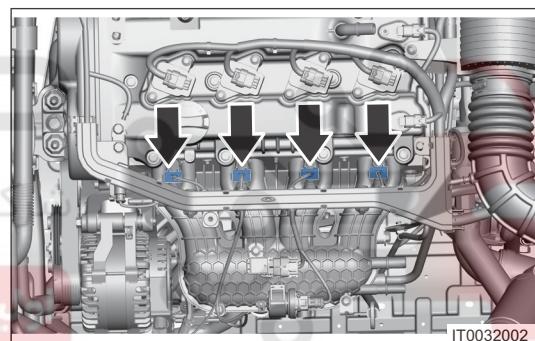
(e) Disconnect clip (arrow) from charcoal canister intake pipe, and pull out charcoal canister intake pipes (arrow).



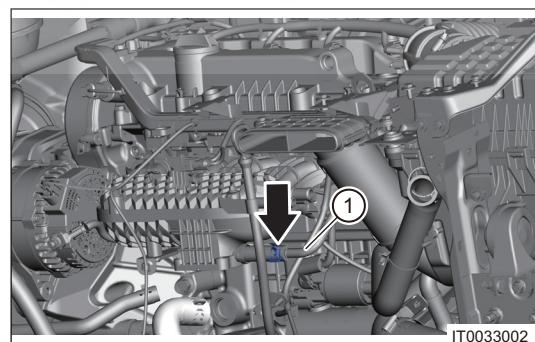
(f) Disconnect the crankcase ventilation box intake pipe (arrow).



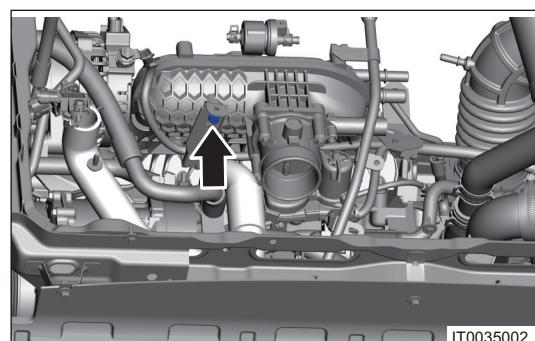
(g) Disconnect 4 connectors (arrow) from high-pressure fuel rail injector.



(h) Remove metal vacuum pipe hose clamp, and disconnect vacuum hose (1).



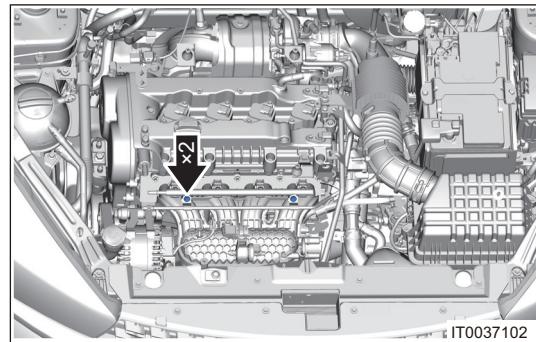
(i) Remove fixing bolt (arrow) from wire harness bracket.



(j) Remove 2 fixing bolts (arrow) from high-pressure fuel rail.

Tightening torque

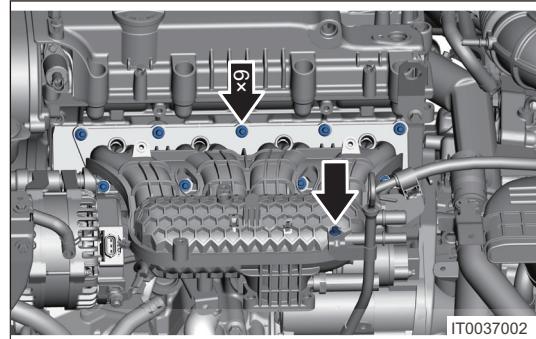
$7 \pm 1 \text{ N}\cdot\text{m}$



(k) Remove the intake manifold assembly.
Remove 9 fixing bolts (arrow) from intake manifold after moving away engine wire harness. Remove fixing bolt (arrow) from oil dipstick tube.

Tightening torque

$7 \pm 1 \text{ N}\cdot\text{m}$



(l) Remove the intake manifold assembly.

Installation

1. Installation is in the reverse order of removal.

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

08



Electronic Accelerator Pedal

Removal

Warning/Caution/Hint

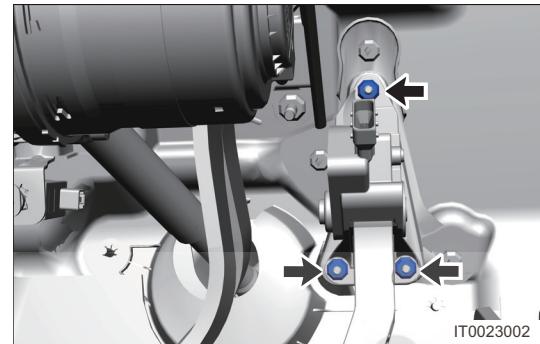
Caution:

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent interior from being scratched during removal and installation.

1. Turn off all electrical equipment and the ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the electronic accelerator pedal.
 - (a) Disconnect the electronic accelerator pedal connector.
 - (b) Remove 3 fixing bolts (arrow) from electronic accelerator pedal.

Tightening torque

$9 \pm 1.5 \text{ N}\cdot\text{m}$



- (c) Remove the electronic accelerator pedal.

Installation

1. Installation is in the reverse order of removal.

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



Intercooler Assembly

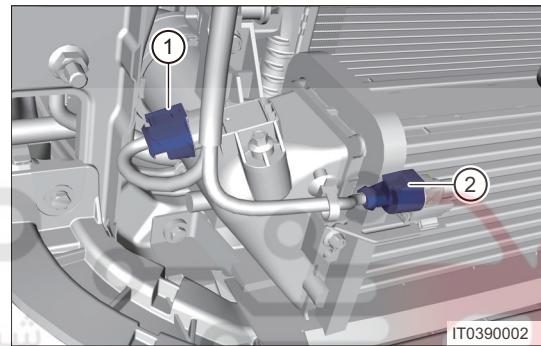
Removal

Warning/Caution/Hint

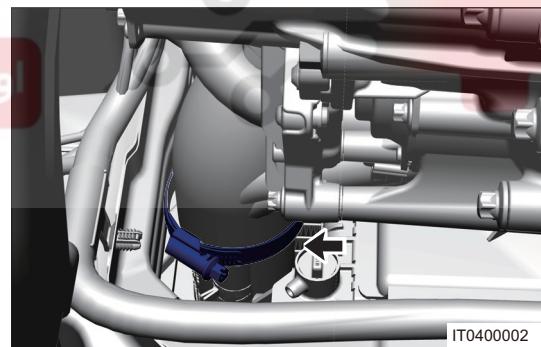
Caution:

- Be sure to wear necessary safety equipment to prevent accidents when repairing.

1. Turn off all electrical equipment and the ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the front compartment lower protector assembly.
4. Remove the front bumper assembly.
5. Remove the upper air deflector.
6. Remove the left air deflector.
7. Remove the right air deflector.
8. Remove the intercooler assembly.
 - (a) Disconnect the boost pressure sensor connector (1).
 - (b) Disconnect the exterior temperature sensor connector (2).



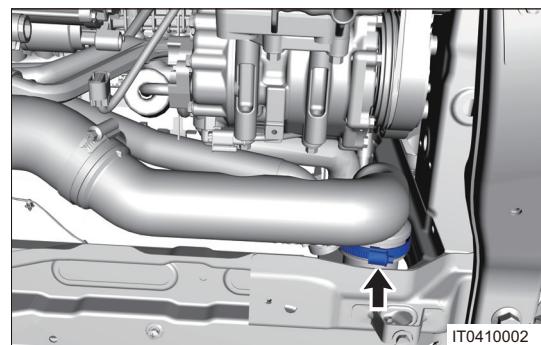
08



IT0400002

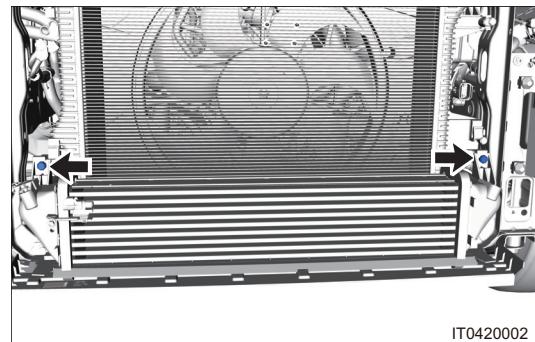
(c) Loosen clamp (arrow) and disconnect connection between intercooler outlet pipe I and intercooler intake port.

(d) Loosen clamp (arrow) and disconnect connection between intercooler intake pipe III and intercooler outlet port.



IT0410002

(e) Remove 2 fixing bolts (arrow) from intercooler assembly.

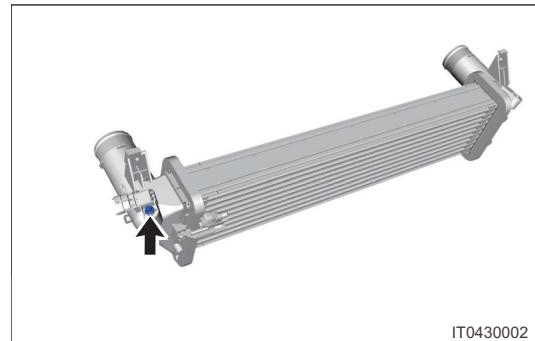


(f) Remove the intercooler assembly.
(g) Remove fixing bolt (arrow) and boost pressure sensor.

Tightening torque

$5 \pm 1 \text{ N}\cdot\text{m}$

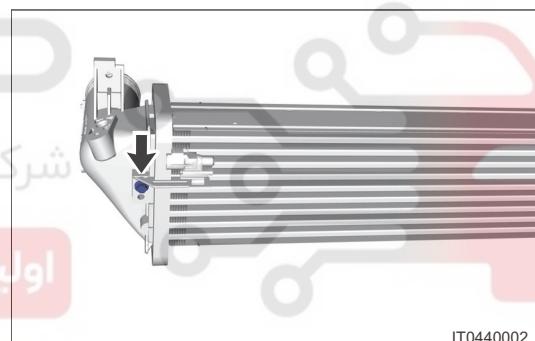
08



(h) Remove exterior temperature sensor bracket fixing bolt (arrow) and exterior temperature sensor.

Tightening torque

$5 \pm 1 \text{ N}\cdot\text{m}$



Installation

1. Installation is in the reverse order of removal.

Intercooler Intake Pipe Assembly

Removal

Warning/Caution/Hint

Caution:

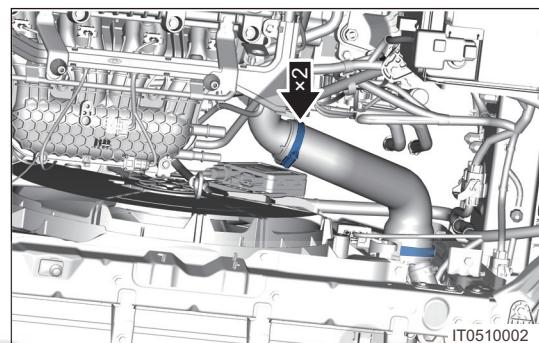
- Be sure to wear necessary safety equipment to prevent accidents when repairing.

1. Remove the left front compartment trim cover assembly.
2. Remove the battery assembly.
3. Remove the battery tray assembly.
4. Remove the intake hose assembly.
5. Remove the intercooler intake pipe III .

(a) Loosen worm clamp (arrow) and disconnect connection between intercooler intake pipe II and intercooler intake pipe III, remove intercooler intake pipe III assembly.

Tightening torque

5 ± 1 N·m

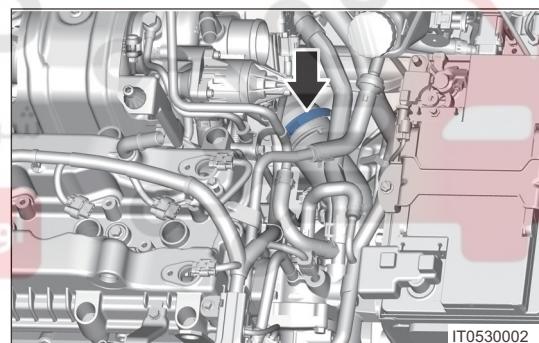


08

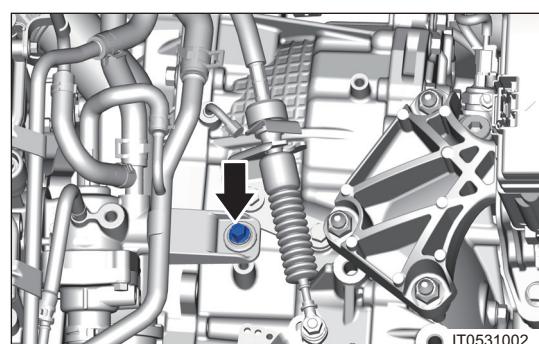
(b) Loosen worm clamp (arrow) and disconnect connection between intercooler intake pipe I and intercooler intake pipe II.

Tightening torque

5 ± 1 N·m

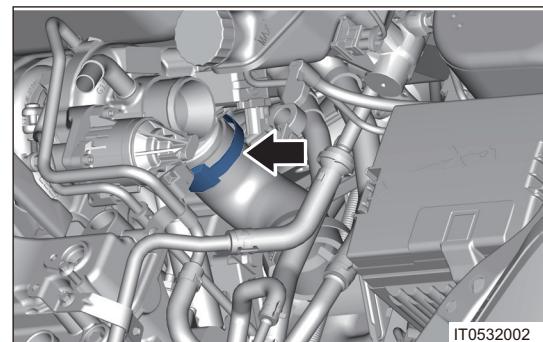


(c) Remove fixing bolt (arrow) from intercooler intake pipe II.



(d) Remove the intercooler intake pipe II assembly.

(e) Remove connection (arrow) between intercooler intake pipeline and turbocharger.



(f) Remove the intercooler intake pipe assembly.

08

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



Intercooler Outlet Pipe

Removal

Warning/Caution/Hint

Caution:

- Be sure to wear necessary safety equipment to prevent accidents when repairing.

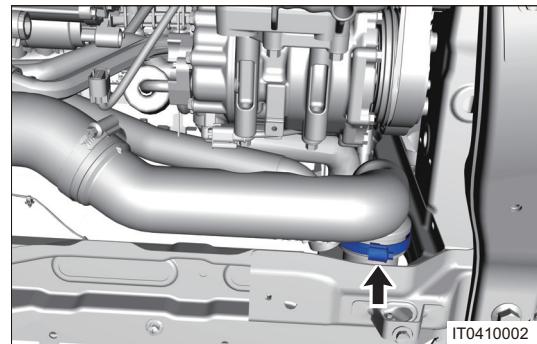
1. Remove the front compartment lower protector assembly.

2. Remove the intercooler outlet pipe I.

(a) Loosen worm clamp (arrow) and disconnect connection between intercooler outlet pipe I and intercooler assembly.

Tightening torque

$5 \pm 1 \text{ N}\cdot\text{m}$

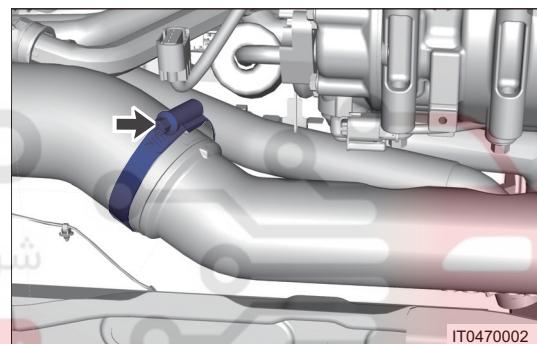


08

(b) Loosen worm clamp (arrow) and disconnect connection between intercooler outlet pipe I and intercooler outlet pipe II.

Tightening torque

$5 \pm 1 \text{ N}\cdot\text{m}$



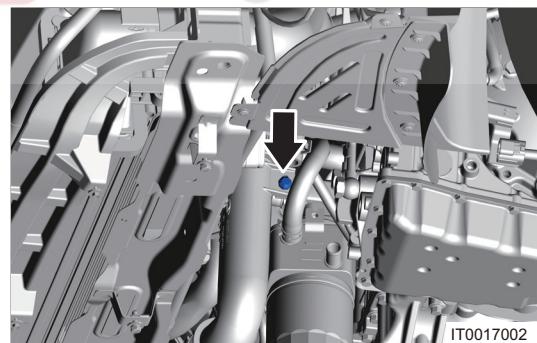
اولین سامانه دیجیتال خودرو سامانه (مسئولیت محدود)

(c) Remove the intercooler outlet pipe I.

(d) Remove fixing bolt (arrow) from intercooler outlet pipe II.

Tightening torque

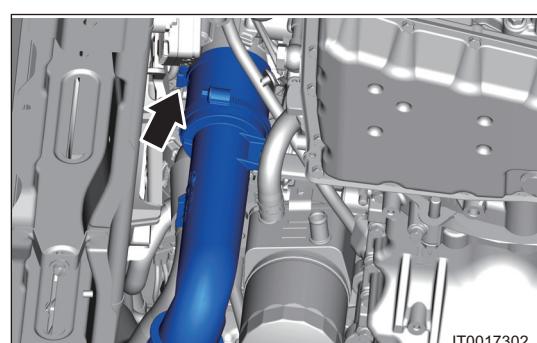
$3.5 \pm 0.5 \text{ N}\cdot\text{m}$



(e) Loosen worm clamp (arrow) and disconnect connection between intercooler outlet pipe II assembly and throttle.

Tightening torque

$5 \pm 1 \text{ N}\cdot\text{m}$



(f) Remove the intercooler outlet pipe II.

Installation

1. Installation is in the reverse order of removal.

08

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

