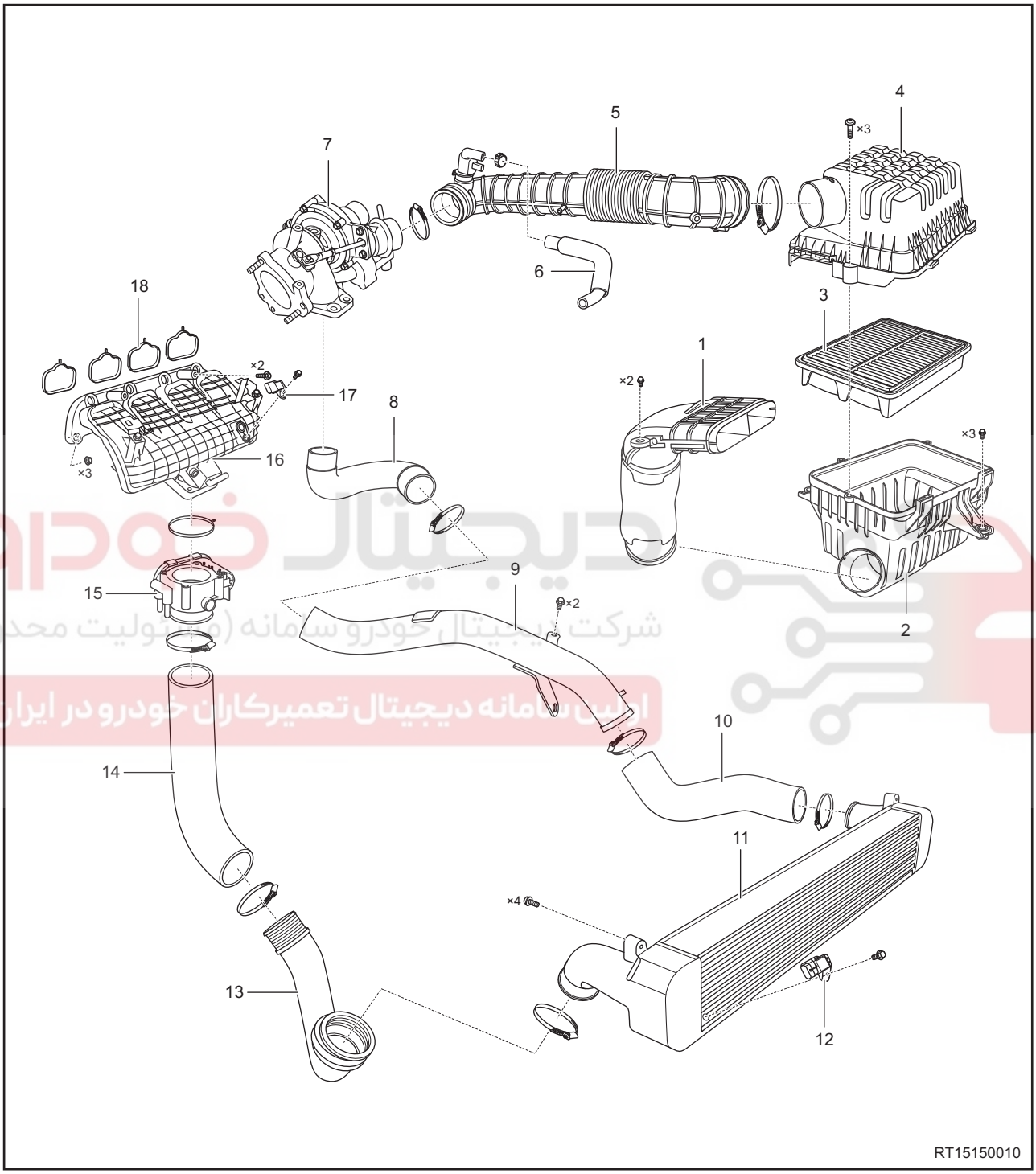
SQRE4T15/SQRE4T15B INTAKE SYSTEM

GENERAL INFORMATION

Description (1.5 TCI + 6 MT)



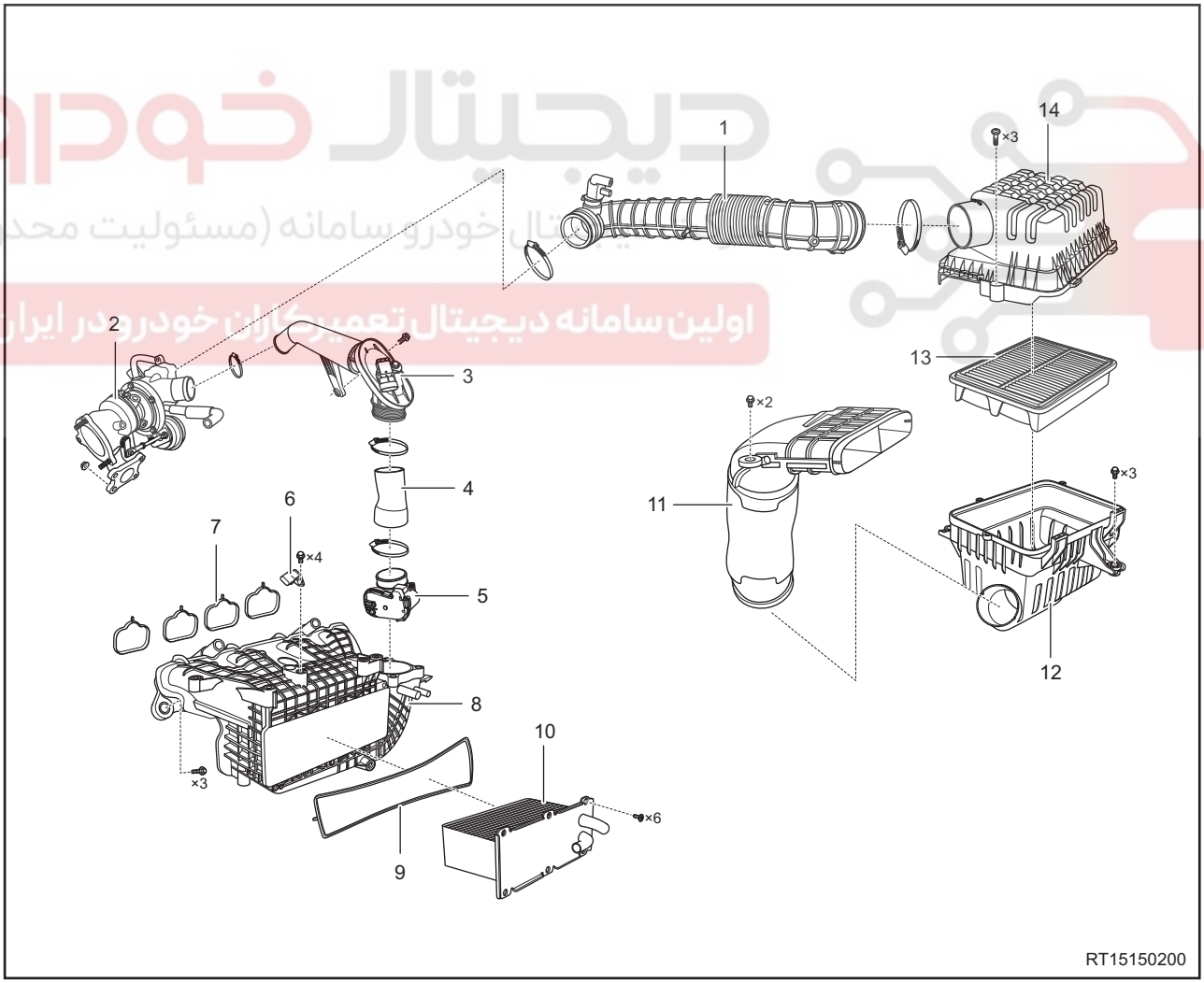
1 - Air Direct Pipe	2 - Air Filter Lower Housing
3 - Air Filter Assembly	4 - Air Filter Upper Housing
5 - Intake Hose Assembly	6 - Hose
7 - Turbocharger	8 - Intercooler Inlet Pipe III

9 - Intercooler Inlet Pipe II	10 - Intercooler Inlet Pipe I
11 - Intercooler Assembly	12 - Booster Pressure/Temperature Sensor
13 - Intercooler Outlet Pipe I	14 - Intercooler Outlet Pipe II
15 - Electronic Throttle	16 - Intake Manifold Assembly
17 - Intake Pressure Sensor	18 - Intake Manifold Gasket

Intake system mainly consists of air direct pipe, air filter assembly, intake hose, turbocharger, intercooler, booster pressure/temperature sensor, electronic throttle assembly, intake pressure sensor and intake manifold assembly, etc.

Intake system uses air filter to filter the particles and dust in air. The filtered air flows into intercooler through turbocharger and then flows into intake manifold assembly through electronic throttle assembly, 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 adjust intake passage area according to driver's driving intention. It controls intake air volume to meet intake requirement of engine in different operating conditions, and sends back position signals of throttle valve plate to control unit to achieve accurate control and run the engine under the optimal control state.

Description (1.5 TCI + DCT)



1 - Intake Hose	2 - Turbocharger
3 - Muffler Assembly	4 - Muffler Hose
5 - Electronic Throttle Assembly	6 - Intake Pressure/Temperature Sensor
7 - Intake Manifold Gasket	8 - Intake Manifold Assembly
9 - Intercooler Gasket	10 - Intercooler Assembly
11 - Air Direct Pipe Assembly	12 - Air Filter Lower Housing
13 - Air Filter Element Assembly	14 - Air Filter Upper Housing

Intake system mainly consists of air direct pipe, air filter assembly, intake hose, turbocharger, booster pressure/temperature sensor, electronic throttle assembly, intake pressure/temperature sensor and intake manifold with intercooler assembly, etc.

Intake system uses air filter to filter the particles and dust in air. The filtered air flows through turbocharger and then flows into intake manifold assembly through electronic throttle assembly (the air is cooled by intercooer built into the intake manifold while flowing into the 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 adjust intake passage area according to driver's driving intention. It controls intake air volume to meet intake requirement of engine in different operating conditions, and sends back position signals of throttle valve plate to control unit to achieve accurate control and run the engine under the optimal control state.

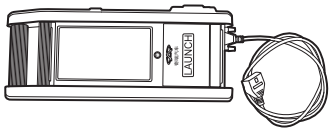
Specifications

Torque Specifications

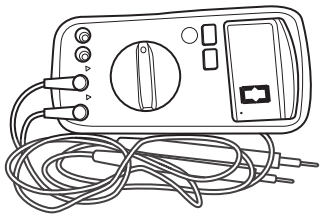
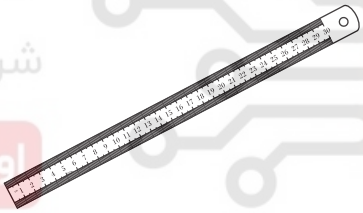
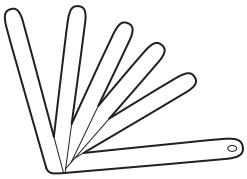
Description	Torque (N·m)
Coupling Screw Between Air Filter Upper Housing and Lower Housing	1.3 ± 0.2
Air Filter Assembly Fixing Bolt	7 ± 1
Air Direct Pipe Fixing Bolt	7 ± 1
Electronic Throttle Assembly Fixing Bolt	8 + 3
Atmospheric Pressure Sensor Fixing Bolt	7 ± 1
Intake Manifold Fixing Nut	20 + 5
Intercooler Inlet Pipe II Assembly Fixing Bolt	23 ± 3.5
Intercooler Assembly Fixing Bolt	7 + 1
Electronic Accelerator Pedal Fixing Bolt	9 ± 1.5
Inlet Pipe Fixing Bolt	8 + 3
Intake Manifold Assembly Fixing Bolt	20 + 5
Intake Pressure/Temperature Sensor Fixing Bolt	7 ± 1
Muffler Assembly Fixing Bolt	9 ± 1.5
Low Temperature Radiator Assembly Fixing Bolt	7 ± 1
Brake Vacuum Pipe Fixing Bolt	8 + 3
Intercooler Outlet Pipe Set Fixing Bolt	8 + 3

Tools

Special Tool

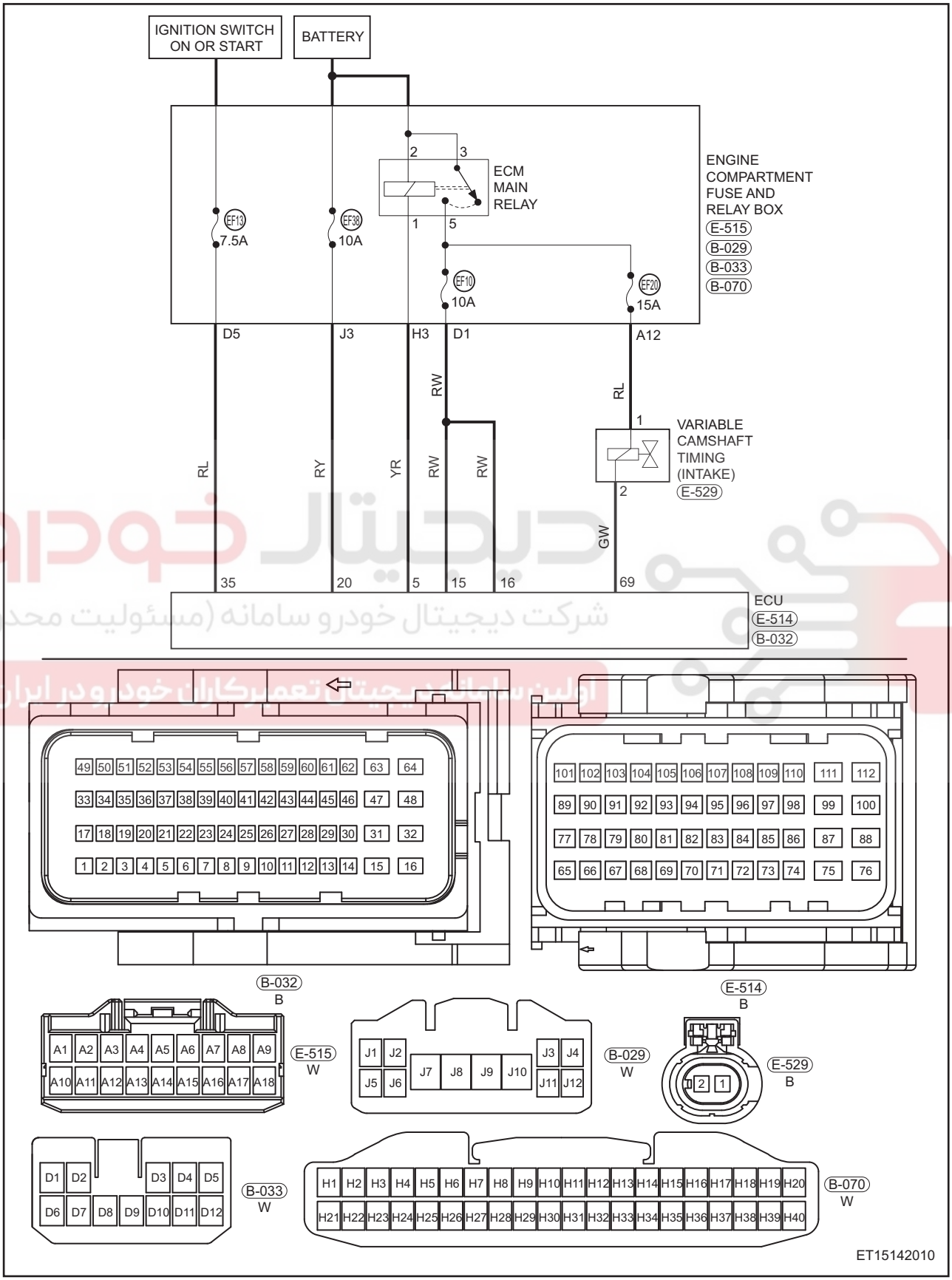
X-431 3G Diagnostic Tester	 RCH0000001

General Tools

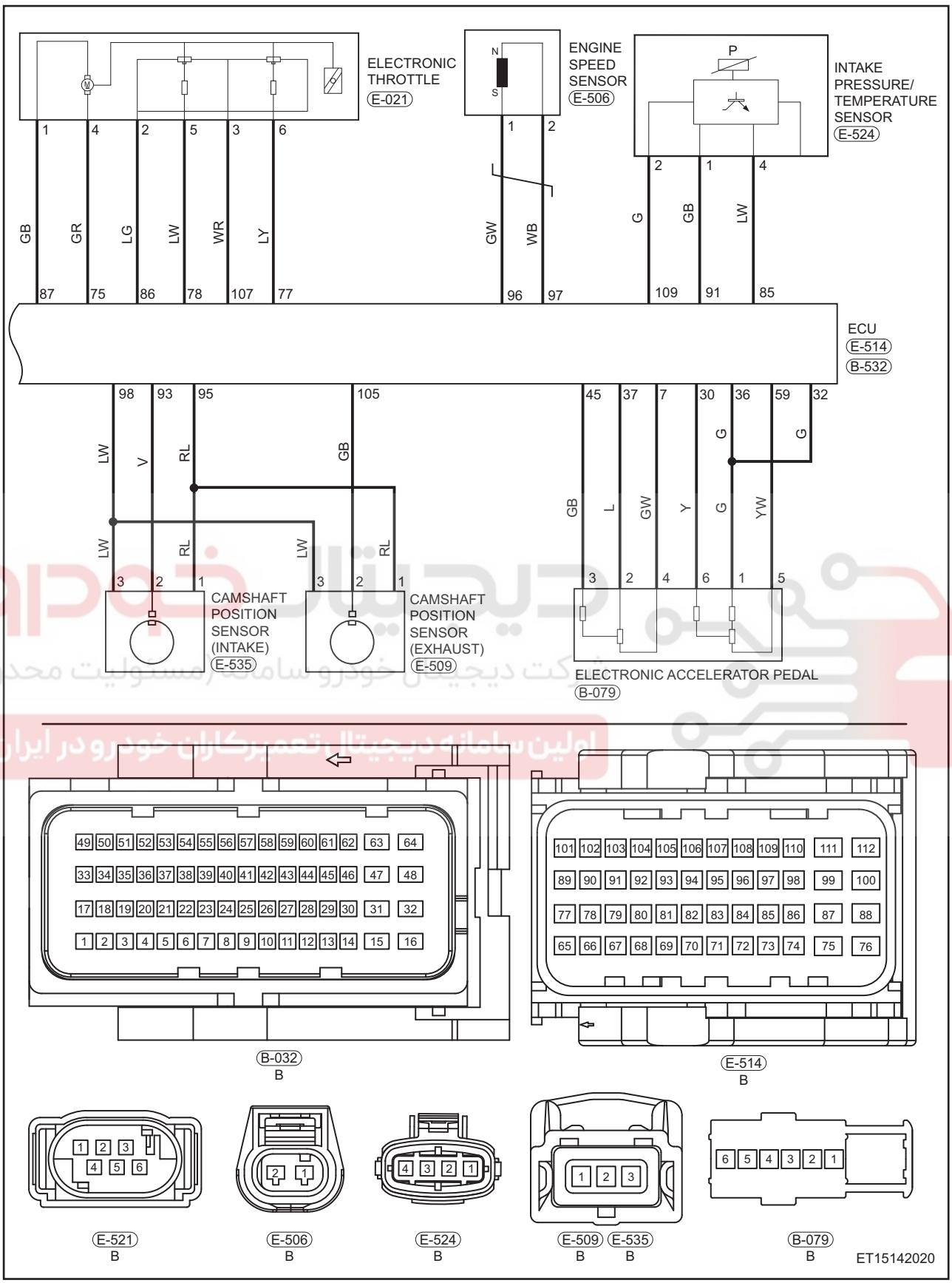
Digital Multimeter	 RCH0000002
Precision Straightedge	 RCH0000063
Feeler Gauge	 RCH0000060

Circuit Diagram

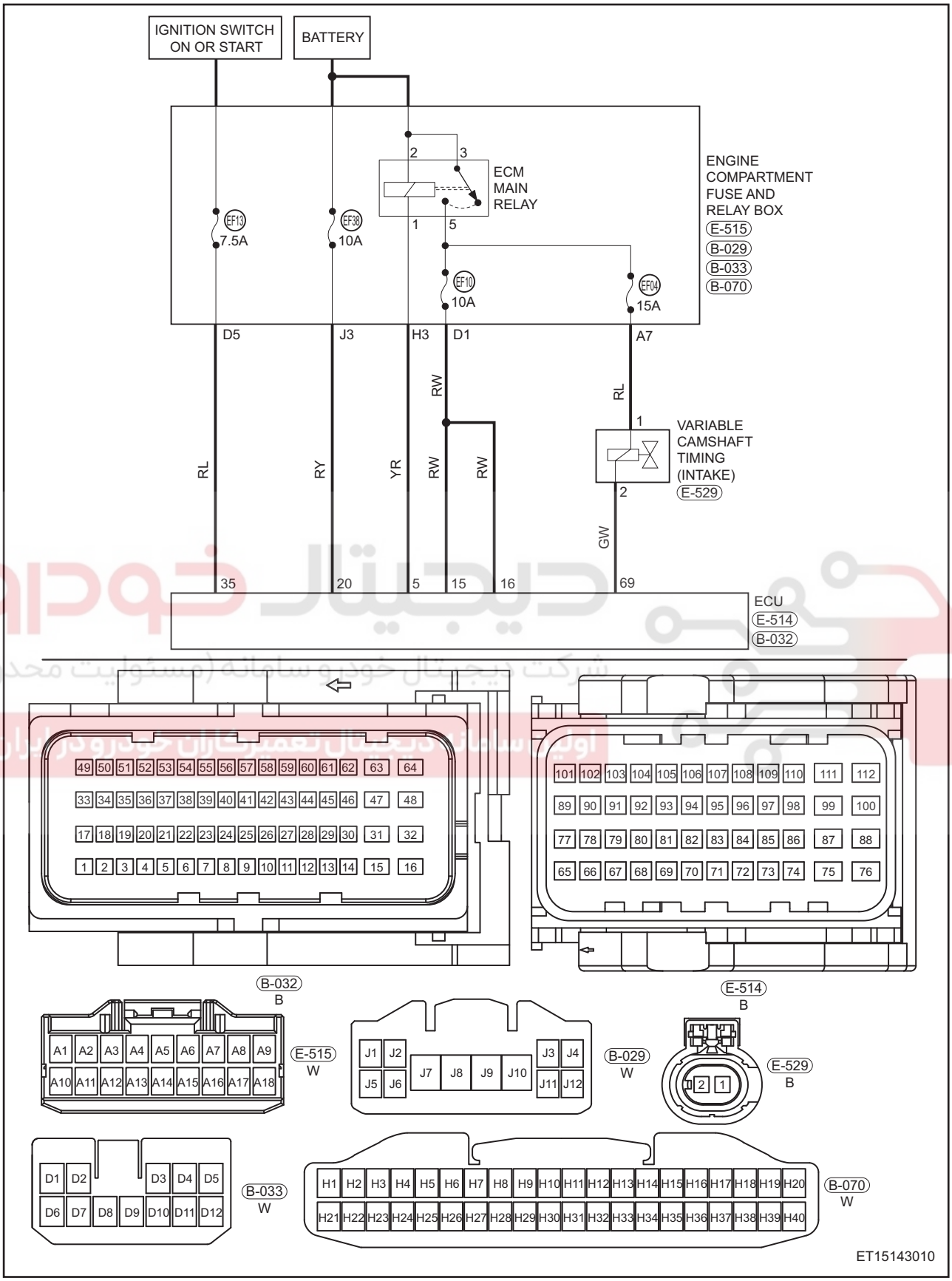
Intake System (1.5 TCI + 6MT) (Page 1 of 2)



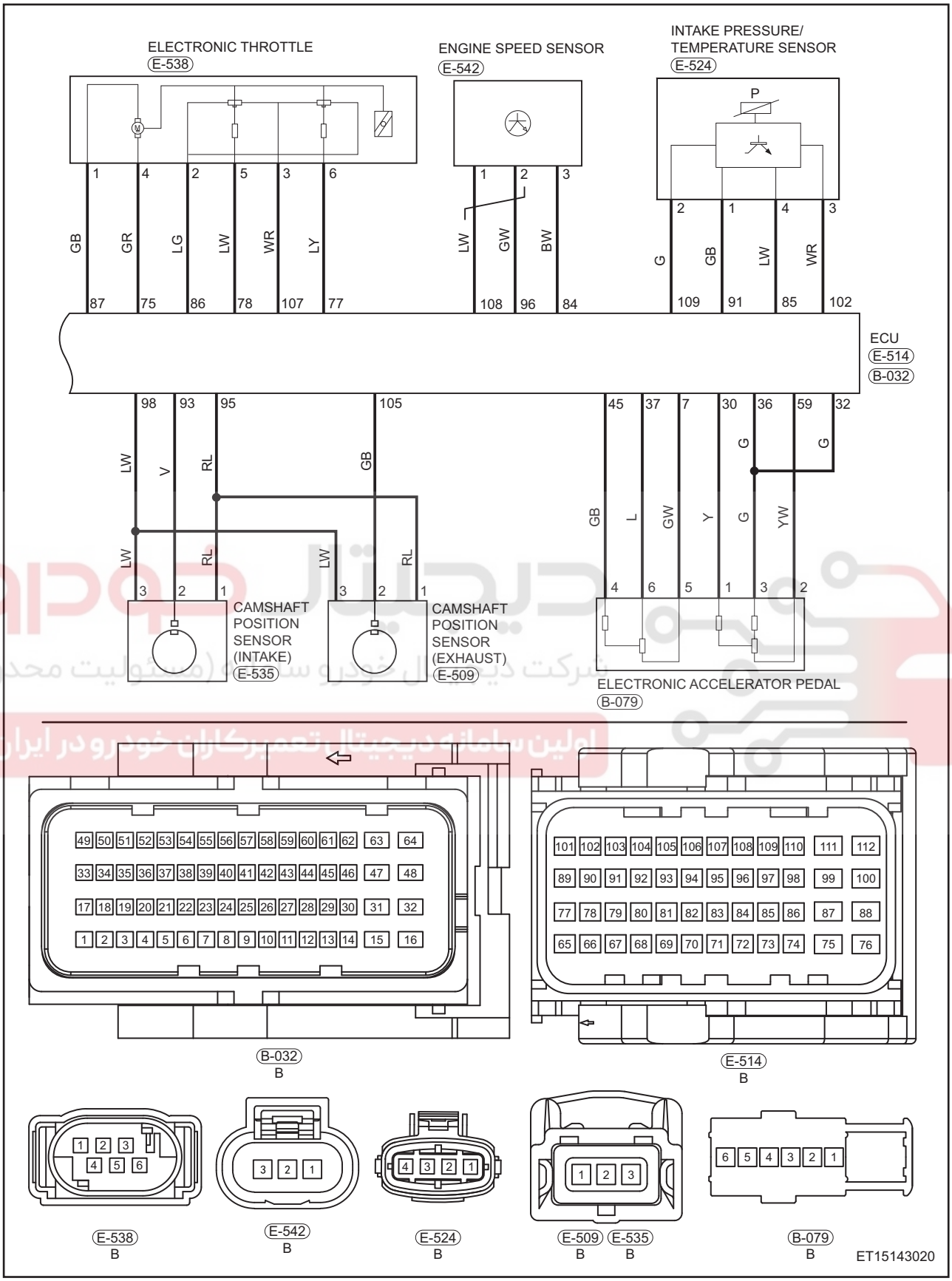
Intake System (1.5 TCI + 6MT) (Page 2 of 2)



Intake System (1.5 TCI + DCT) (Page 1 of 2)



Intake System (1.5 TCI + DCT) (Page 2 of 2)



DIAGNOSIS & TESTING

Problem Symptoms Table

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

Symptom	Suspected Area	See page
Engine idles roughly	Electronic throttle assembly (dirty)	16-20
	Intake manifold assembly (broken, leaked)	16-28
	Activated charcoal canister solenoid valve (remains on)	07-307
	Intake pressure/temperature sensor	06-242
	Throttle gasket (damaged)	15-11
	Fuel rail injector assembly (installed incorrectly)	11-26

ON-VEHICLE SERVICE

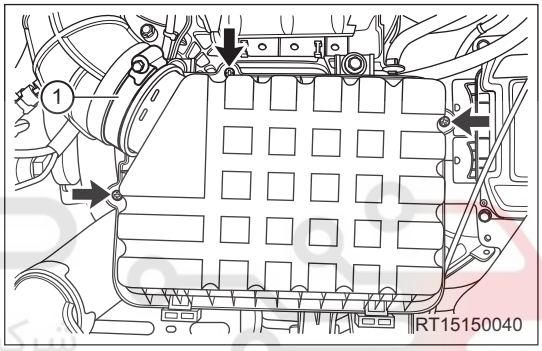
Air Filter Element

Removal

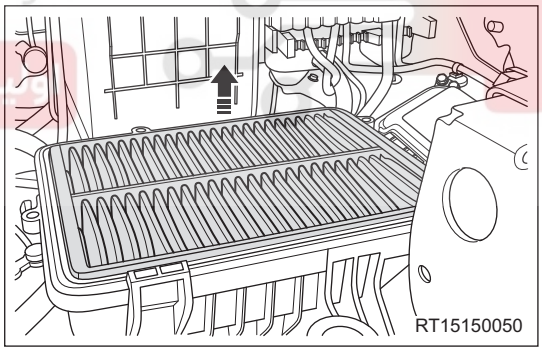
CAUTION

- 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 switch.
2. Disconnect the negative battery cable.
3. Remove the air filter element.
   a. Remove 3 coupling screws (arrow) between air filter upper housing and lower housing.
      (Tightening torque: 1.3 ± 0.2 N·m)
   b. Loosen worm clamp (1) and disconnect connection between air filter and intake hose.
      (Tightening torque: 3 ± 0.5 N·m)
   c. Remove the air filter upper housing.



   d. Remove air filter element in direction of arrow.



Installation

1. Clean 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.

ENVIRONMENTAL PROTECTION

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

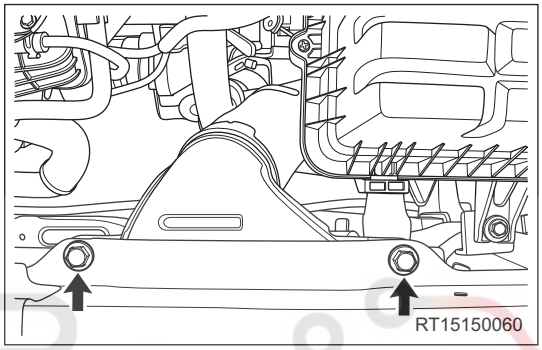
Air Filter Assembly

Removal

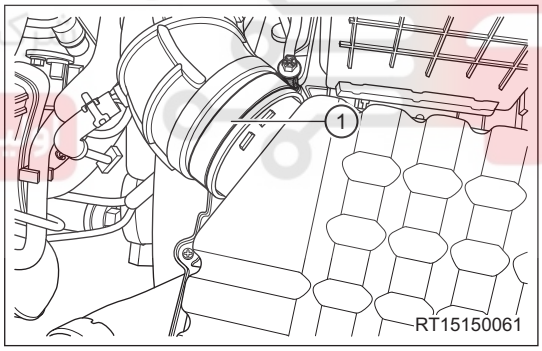
CAUTION

- 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.

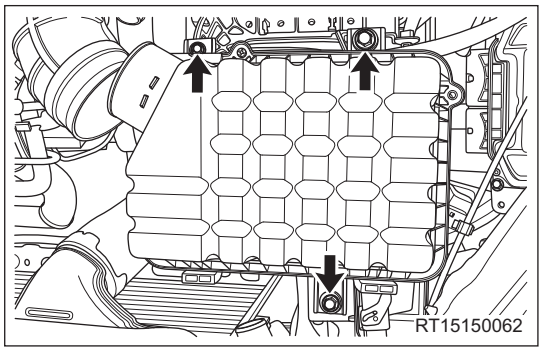
1. Turn off all electrical equipment and the engine switch.
2. Disconnect the negative battery cable.
3. Remove the air direct pipe assembly.
   a. Remove 2 fixing bolts (arrow) from air direct pipe.
      (Tightening torque: 7 ± 1 N·m)



4. Remove the air filter assembly.
   a. Loosen worm clamp (1) and disconnect connection between air filter and intake hose.
      (Tightening torque: 3 ± 0.5 N·m)



   b. Remove 3 fixing bolts (arrow) from air filter.
      (Tightening torque: 7 ± 1 N·m)



   c. Remove the air filter assembly.

Installation

Installation is in the reverse order of removal.

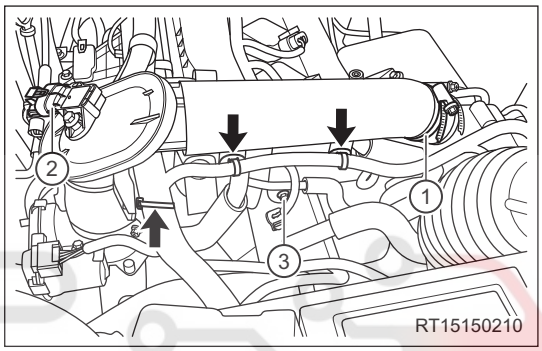
Muffler and Muffler Hose (1.5 TCI + DCT)

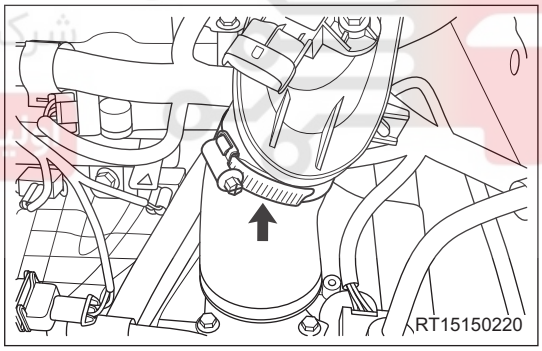
Removal

CAUTION

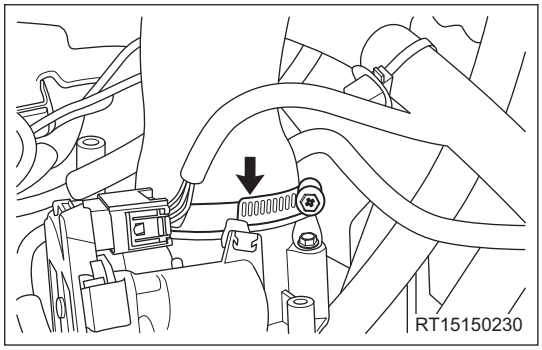
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

1. Turn off all electrical equipment and the engine switch.
2. Disconnect the negative battery cable.
3. Remove the intake hose assembly.
4. Remove the muffler assembly.
   a. Remove fixing clips (arrow) between engine wire harness and muffler assembly.
   b. Loosen worm clamp (1) and disconnect connection between muffler assembly and turbocharger.
      (Tightening torque: 5 ± 1 N·m)
   c. Disconnect the booster pressure/temperature sensor connector (2).
   d. Remove fixing bolt (3) from muffler assembly.
      (Tightening torque: 9 ± 1.5 N·m)
   e. Loosen worm clamp (arrow) and disconnect connection between muffler assembly and muffler hose.
      (Tightening torque: 5 ± 1 N·m)





   f. Remove the muffler assembly.
5. Remove the muffler hose.
   a. Loosen worm clamp (arrow) and disconnect connection between muffler hose and throttle assembly.
      (Tightening torque: 3 ± 0.5 N·m)



Installation

Installation is in the reverse order of removal.

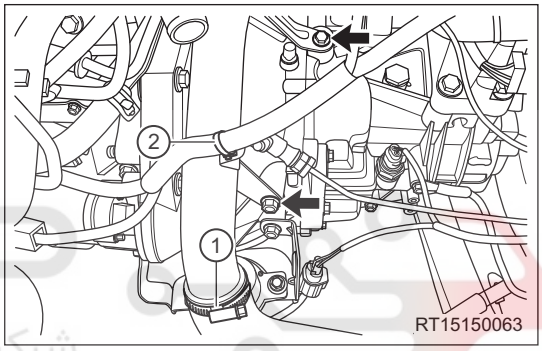
Intercooler Inlet Pipe II Assembly (1.5 TCI + 6MT)

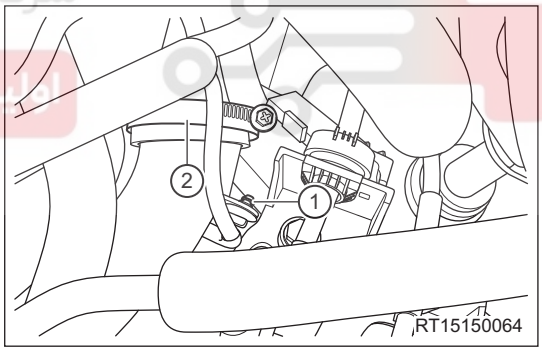
Removal

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 switch.
2. Disconnect the negative battery cable.
3. Remove the air filter assembly (See page 16-13).
4. Remove the battery assembly (See page 28-7).
5. Remove the intercooler inlet pipe II assembly.
   a. Remove 2 fixing bolts (arrow) from intercooler inlet pipe II assembly.
      (Tightening torque: 23 ± 3.5 N·m)
   b. Loosen worm clamp (1) and disconnect connection between intercooler inlet pipe II and intercooler inlet pipe III.
      (Tightening torque: 5 ± 1 N·m)
   c. Pry up wire harness fixing clip (2) from intercooler inlet pipe II assembly bracket with a tool.
   d. Pry up wire harness fixing clip (1) from intercooler inlet pipe II assembly bracket with a tool.
   e. Loosen worm clamp (2) and disconnect connection between intercooler inlet pipe I and intercooler inlet pipe II.
      (Tightening torque: 5 ± 1 N·m)





   f. Remove the intercooler inlet pipe II assembly.

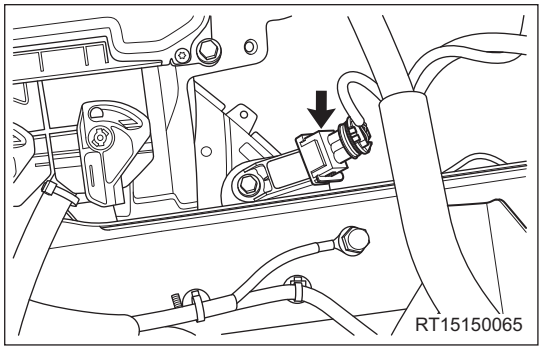
Installation

Installation is in the reverse order of removal.

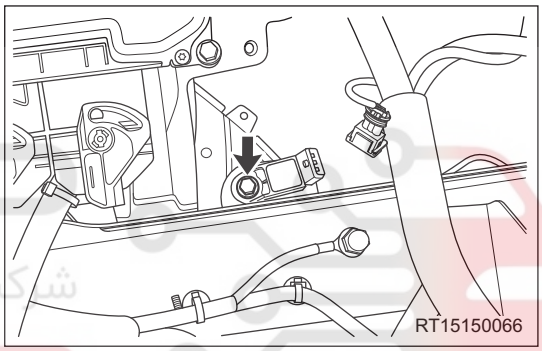
Atmospheric Pressure Sensor (1.5 TCI + 6MT)

Removal

1. Turn off all electrical equipment and the engine switch.
2. Disconnect the negative battery cable.
3. Remove the air filter assembly (See page 16-13).
4. Remove the atmospheric pressure sensor.
   a. Disconnect the atmospheric pressure sensor connector (arrow).



   b. Remove fixing bolt (arrow) from atmospheric pressure sensor.
   (Tightening torque: 7 ± 1 N·m)



   c. Remove the atmospheric pressure sensor.

Installation

Installation is in the reverse order of removal.

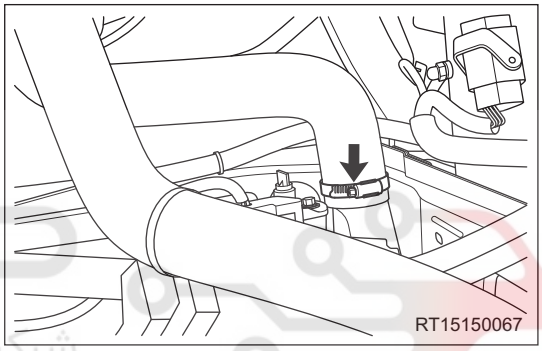
Intercooler Assembly (1.5 TCI + 6MT)

Removal

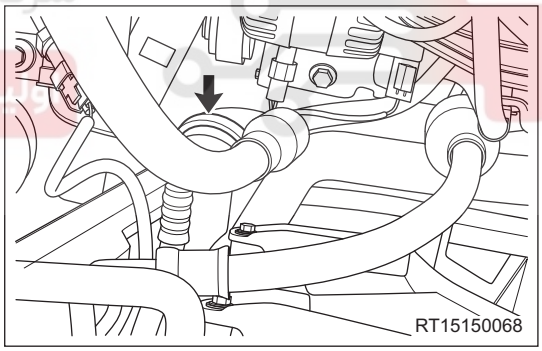
CAUTION

- 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.

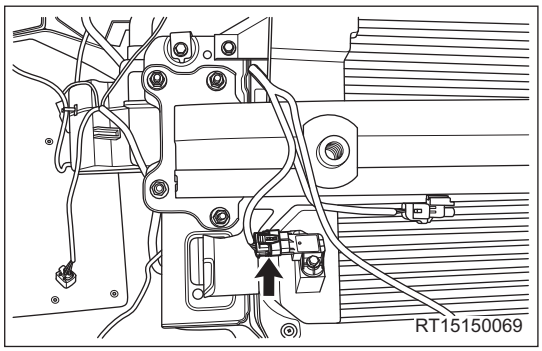
1. Turn off all electrical equipment and the engine switch.
2. Disconnect the negative battery cable.
3. Remove the air filter assembly (See page 16-13).
4. Remove the front bumper assembly (See page 63-6).
5. Remove the intercooler assembly.
   a. Loosen worm clamp (arrow) and disconnect connection between intercooler assembly and intercooler inlet pipe III.
      (Tightening torque: 5 ± 1 N·m)



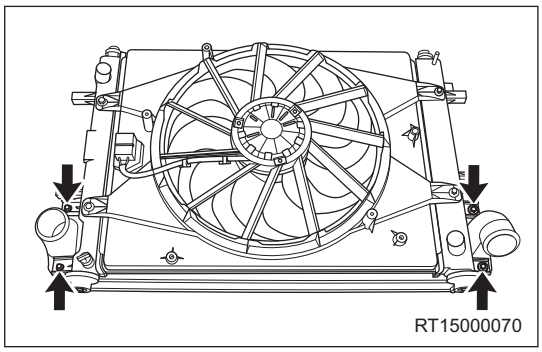
   b. Loosen worm clamp (arrow) and disconnect connection between intercooler assembly and intercooler outlet pipe I.
      (Tightening torque: 5 ± 1 N·m)



   c. Disconnect the booster pressure/temperature sensor connector (arrow).



d. Remove 4 fixing bolts (arrow) between intercooler assembly and radiator assembly.
(Tightening torque: 7 ± 1 N·m)



e. Remove the intercooler assembly.

Installation

Installation is in the reverse order of removal.

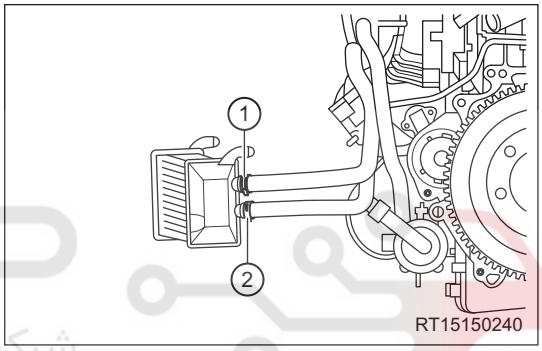
Low Temperature Radiator (1.5 TCI + DCT)

Removal

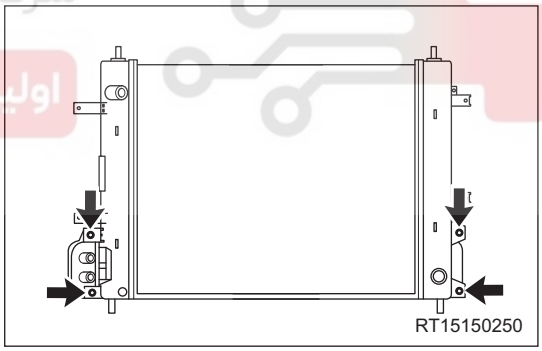
CAUTION

- 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 switch.
2. Disconnect the negative battery cable.
3. Remove the air filter assembly (See page 16-13).
4. Remove the front bumper assembly (See page 63-6).
5. Remove the low temperature radiator assembly.
   a. Loosen elastic clamp (1) and disconnect connection between low temperature radiator inlet pipe and low temperature radiator assembly.
   b. Loosen elastic clamp (2) and disconnect connection between low temperature radiator outlet pipe and low temperature radiator assembly.



   c. Remove 4 fixing bolts (arrow) from low temperature radiator assembly.
   (Tightening torque: 7 ± 1 N·m)



   d. Remove the low temperature radiator assembly.

Installation

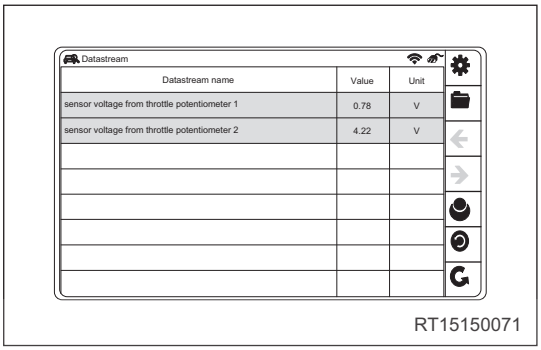
Installation is in the reverse order of removal.

Electronic Throttle Assembly (1.5 TCI + 6MT)

On-vehicle Inspection

1. Check the electronic throttle assembly.
   a. Throttle valve plate should be in NLP position with power off and can rotate smoothly when flipping it by hand. If seizing occurs, it indicates that internal components may be damaged, and electronic throttle assembly should be replaced.
   b. Connect X-431 3G diagnostic tester to Data Link Connector (DLC).
   c. Turn engine switch to ON and turn on X-431 3G diagnostic tester.
   d. Read datastream on X-431 3G diagnostic tester.
      - Accelerator pedal released

Datastream Name	Specification (V)
Sensor voltage from throttle potentiometer 1	0.78
Sensor voltage from throttle potentiometer 2	4.21



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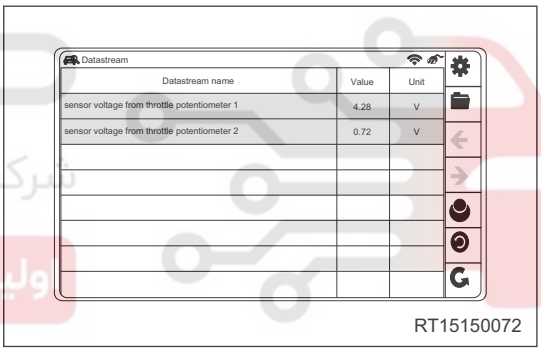
      - Accelerator pedal depressed

Datastream Name	Specification (V)
Sensor voltage from throttle potentiometer 1	4.25
Sensor voltage from throttle potentiometer 2	0.75



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If result is not as specified, check wire harness, ECM, or replace electronic throttle assembly.

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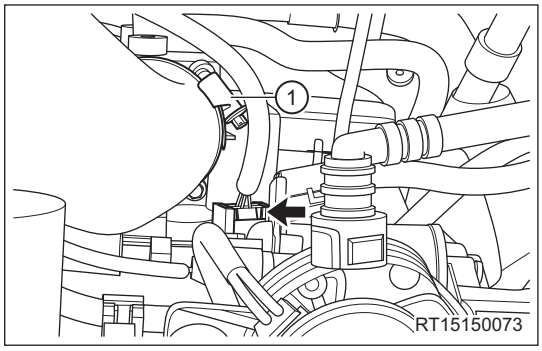
Removal

CAUTION

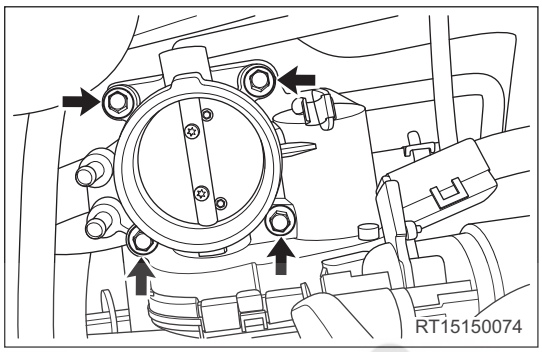
- Temperature of engine compartment is very high when engine is running. Before removal, make sure that engine has stopped running and engine compartment has cooled down sufficiently, otherwise, there is a risk of scald injury.
- Be sure to wear necessary safety equipment to prevent accidents when repairing.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

1. Turn off all electrical equipment and the engine switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.

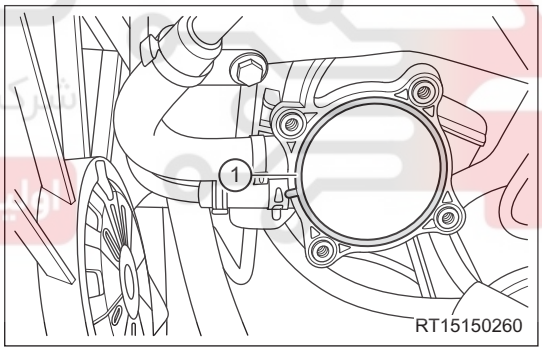
4. Move away the intake hose from electronic throttle assembly.
   a. Loosen worm clamp (1) and disconnect connection between intake hose and electronic throttle assembly.
      (Tightening torque: 3 ± 0.5 N·m)
   b. Disconnect the electronic throttle assembly connector (arrow).



5. Remove the electronic throttle assembly.
   a. Remove 4 fixing bolts (arrow) from electronic throttle assembly.
      (Tightening torque: 8 + 3 N·m)

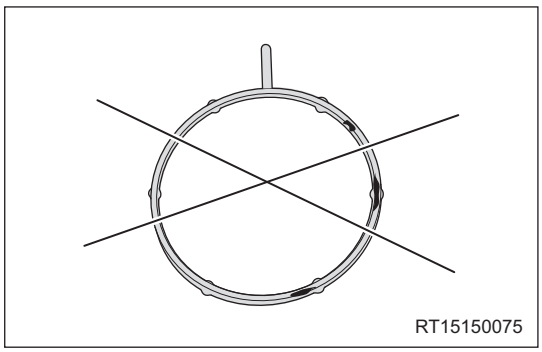


   b. Remove the electronic throttle assembly.
   c. Remove electronic throttle assembly gasket (1) from intake manifold.



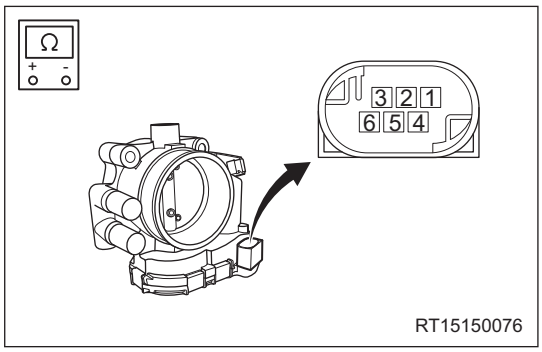
Inspection

1. Check the electronic throttle assembly gasket.
   Check electronic throttle assembly gasket for wear or deterioration. If there is wear or deterioration, replace electronic throttle assembly gasket.



2. Check the electronic throttle assembly.
   Measure resistance of electronic throttle assembly according to table below.

Multimeter Connection	Standard Condition
Terminal 2 - Terminal 3	1.067 kΩ（resistance at ambient temperature）
Terminal 6 - Terminal 2 Terminal 6 - Terminal 3	As throttle opens, resistance between terminals 6 and 2 increases, and resistance between terminals 6 and 3 decreases.
Terminal 5 - Terminal 2 Terminal 5 - Terminal 3	As throttle opens, resistance between terminals 5 and 2 decreases, and resistance between terminals 5 and 3 increases.



RT15150076

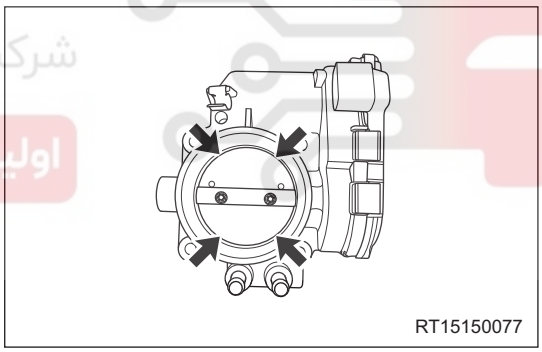
Cleaning

Cleaning Tool

1. Thin stick: used to support throttle valve plate for cleaning 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 valve plate.
2. Clean cloth or paper towel.

Cleaning Process

1. Remove electronic throttle assembly, and make valve plate face upward in free condition. Avoid cleaner flowing into electronic element through valve plate shaft, resulting in functional failure.
2. Start to clean when it is as shown in illustration.

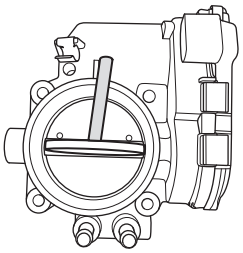

RT15150077

⚠ WARNING

Cleaner is a kind of flammable and corrosive fluid. Follow safety cautions to prevent accidents, and avoid skin contacting with the cleaner.

3. Apply appropriate amount of cleaner to inner wall of throttle valve body, and remove carbon with clean cloth.

4. Support throttle valve with a thin stick, and clean carbon on valve plate and throttle valve body inner wall.


RT15150078

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

Installation

Installation is in the reverse order of removal.

CAUTION

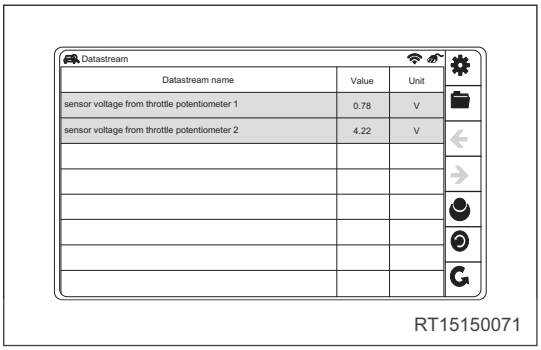
- Clean fitting surface of electronic throttle assembly.
- Perform throttle self-learning procedures after installation (See page 07-23). After self-learning is completed, start vehicle and check for proper operation.

Electronic Throttle Assembly (1.5 TCI + DCT)

On-vehicle Inspection

1. Check the electronic throttle assembly.
   a. Throttle valve plate should be in NLP position with power off and can rotate smoothly when flipping it by hand. If seizing occurs, it indicates that internal components may be damaged, and electronic throttle assembly should be replaced.
   b. Connect X-431 3G diagnostic tester to Data Link Connector (DLC).
   c. Turn engine switch to ON and turn on X-431 3G diagnostic tester.
   d. Read datastream on X-431 3G diagnostic tester.
      - Accelerator pedal released

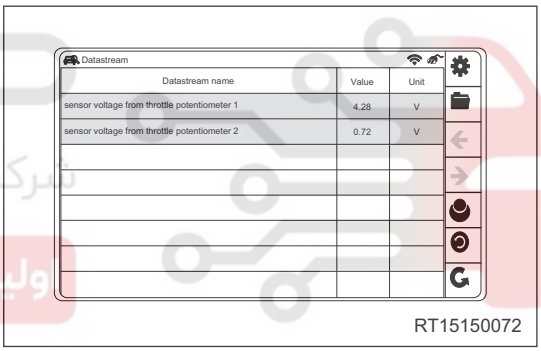
Datastream Name	Specification (V)
Sensor voltage from throttle potentiometer 1	0.78
Sensor voltage from throttle potentiometer 2	4.21



RT15150071

      - Accelerator pedal depressed

Datastream Name	Specification (V)
Sensor voltage from throttle potentiometer 1	4.25
Sensor voltage from throttle potentiometer 2	0.75



RT15150072

If result is not as specified, check wire harness, ECM, or replace electronic throttle assembly.

16

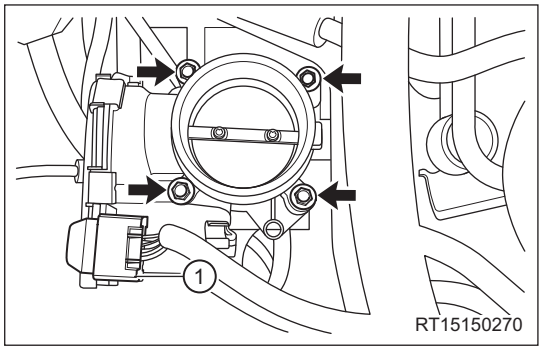
Removal

CAUTION

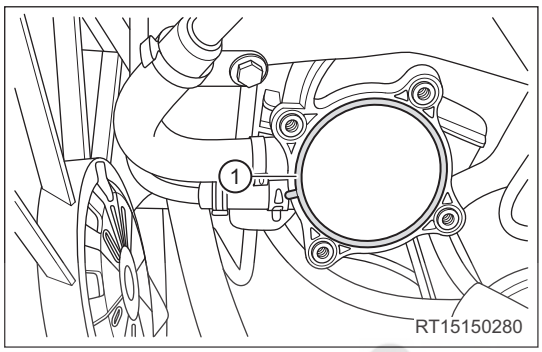
- Temperature of engine compartment is very high when engine is running. Before removal, make sure that engine has stopped running and engine compartment has cooled down sufficiently, otherwise, there is a risk of scald injury.
- Be sure to wear necessary safety equipment to prevent accidents when repairing.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

1. Turn off all electrical equipment and the engine switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Remove the muffler hose (See page 16-14).

5. Remove the electronic throttle assembly.
   a. Disconnect the electronic throttle connector (1).
   b. Remove 4 fixing bolts (arrow) from electronic throttle. (Tightening torque: 8 + 3 N·m)



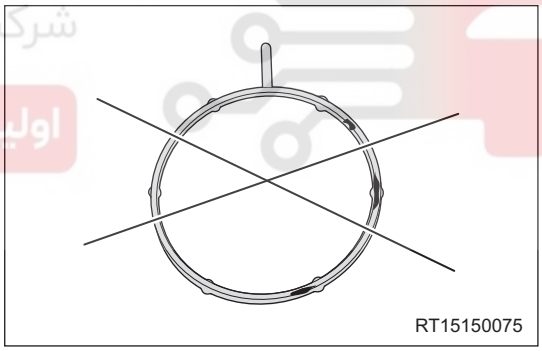
   c. Remove the electronic throttle assembly.



   d. Remove throttle gasket (1) from intake manifold.

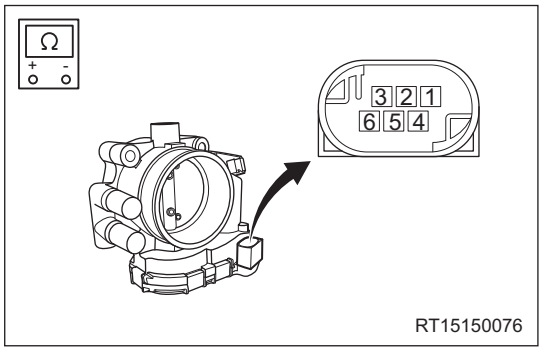
Inspection

1. Check the electronic throttle assembly gasket.
   Check electronic throttle assembly gasket for wear or deterioration. If there is wear or deterioration, replace electronic throttle assembly gasket.



2. Check the electronic throttle assembly.
   Measure resistance of electronic throttle assembly according to table below.

Multimeter Connection	Standard Condition
Terminal 2 - Terminal 3	1.067 kΩ (resistance at ambient temperature)
Terminal 6 - Terminal 2 Terminal 6 - Terminal 3	As throttle opens, resistance between terminals 6 and 2 increases, and resistance between terminals 6 and 3 decreases.



Multimeter Connection	Standard Condition
Terminal 5 - Terminal 2 Terminal 5 - Terminal 3	As throttle opens, resistance between terminals 5 and 2 decreases, and resistance between terminals 5 and 3 increases.

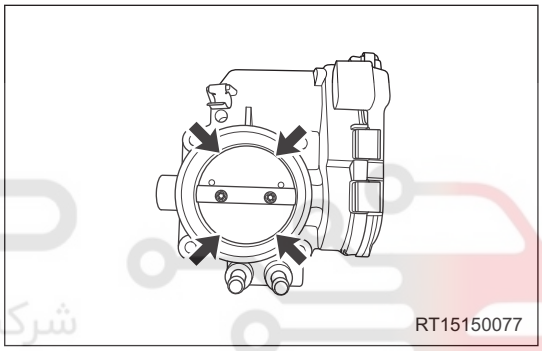
Cleaning

Cleaning Tool

1. Thin stick: used to support throttle valve plate for cleaning 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 valve plate.
2. Clean cloth or paper towel.

Cleaning Process

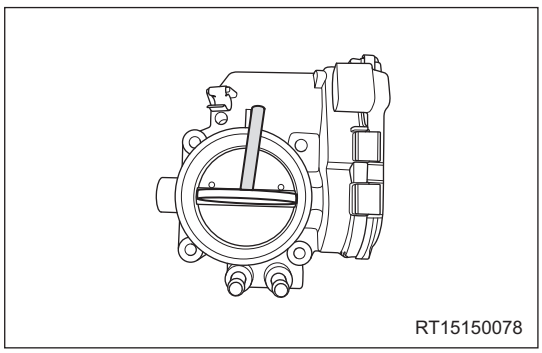
1. Remove electronic throttle assembly, and make valve plate face upward in free condition. Avoid cleaner flowing into electronic element through valve plate shaft, resulting in functional failure.
2. Start to clean when it is as shown in illustration.


RT15150077

⚠ WARNING

Cleaner is a kind of flammable and corrosive fluid. Follow safety cautions to prevent accidents, and avoid skin contacting with the cleaner.

3. Apply appropriate amount of cleaner to inner wall of throttle valve body, and remove carbon with clean cloth.
4. Support throttle valve with a thin stick, and clean carbon on valve plate and throttle valve body inner wall.


RT15150078

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

Installation

Installation is in the reverse order of removal.

CAUTION

- Clean fitting surface of electronic throttle assembly.
- Perform throttle self-learning procedures after installation (See page 08-23). After self-learning is completed, start vehicle and check for proper operation.

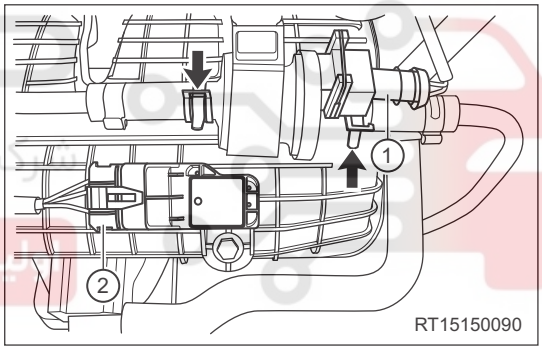
Intake Manifold Assembly (1.5 TCI + 6MT)

Removal

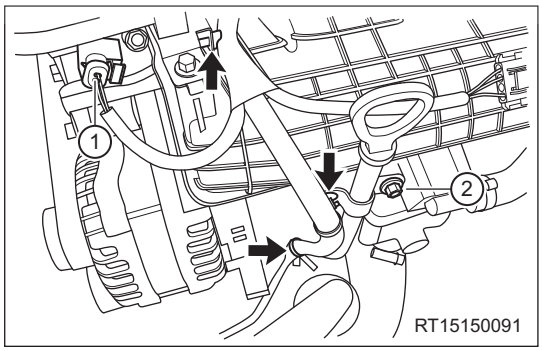
CAUTION

- Temperature of engine compartment is very high when engine is running. Before removal, make sure that engine has stopped running 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.

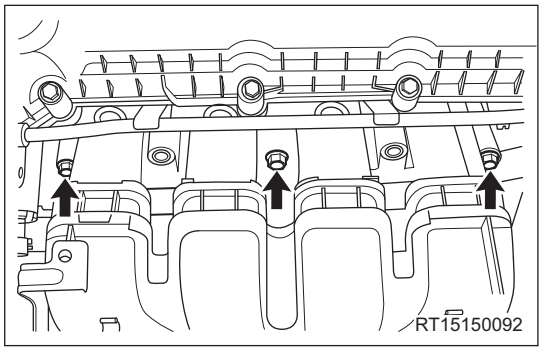
1. Release the fuel system pressure (See page 12-10).
2. Turn off all electrical equipment and the engine switch.
3. Disconnect the negative battery cable.
4. Remove the engine trim cover.
5. Remove the fuel rail injector assembly (See page 12-26).
6. Remove the electronic throttle assembly (See page 16-20).
7. Remove the intake manifold assembly.
   a. Loosen elastic clamps (arrow) and disconnect connection between fuel vapor hose and charcoal canister solenoid valve.
   b. Disconnect the intake pressure sensor connector (2).



   c. Disconnect the intake camshaft variable timing control valve connector (1).
   d. Pry up wire harness fixing clips (arrow) with a tool.
   e. Remove fixing bolt from oil dipstick tube.
   (Tightening torque: 7 ± 1 N·m)



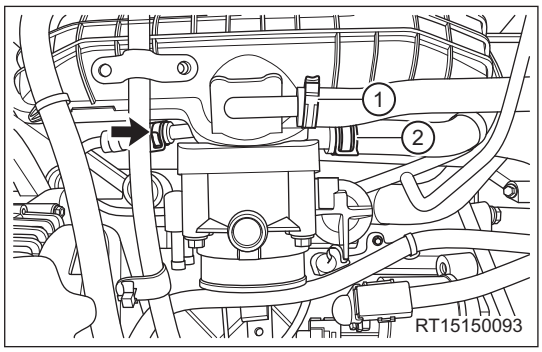
   f. Remove 3 fixing nuts (arrow) from intake manifold.
   (Tightening torque: 20 ± 5 N·m)



g. Loosen clamping ring (1), and disconnect connection between PCV valve hose and intake manifold.

h. Loosen elastic clamp (2) and disconnect connection between brake vacuum pipe and intake manifold.

i. Loosen elastic clamp (arrow) and disconnect connection between canister solenoid valve outlet pipe and intake manifold.

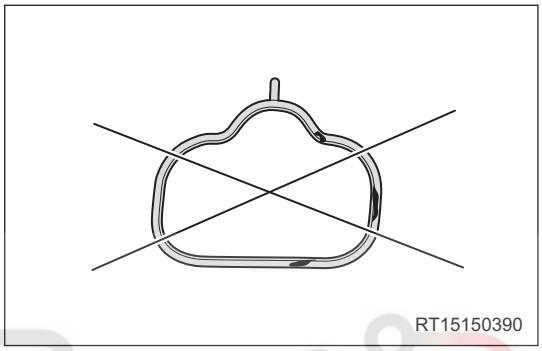


j. Remove the intake manifold assembly.

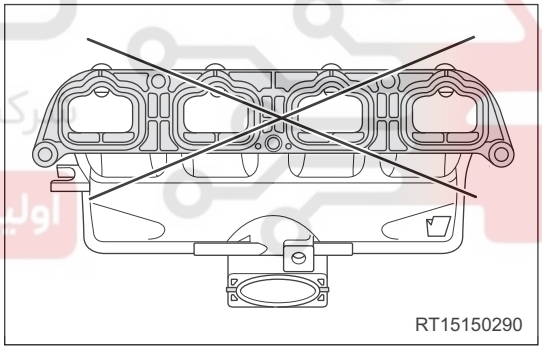
Inspection

1. Check the intake manifold gasket.

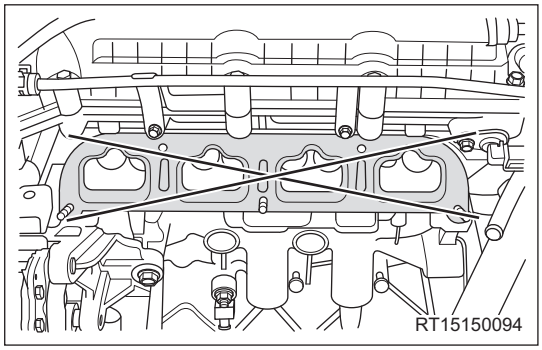
   Check intake manifold gasket, and replace if it is deteriorated or damaged.



2. Check flatness of intake manifold mounting surface.
   a. Clean and check contact surface between intake manifold assembly and cylinder head.
   b. Using a precision straightedge and feeler gauge, check intake manifold flatness. If warpage on the surface is greater than 0.8 mm, replace intake manifold assembly.



3. Check warpage on cylinder head surface of intake manifold installation side.
   a. Clean and check contact surface between intake manifold assembly and cylinder head.
   b. Measure warpage on cylinder head side surface with a precision ruler and a feeler gauge. If warpage on the surface is greater than 0.04 mm, replace cylinder head assembly.



Installation

Installation is in the reverse order of removal.

CAUTION

- Clean fitting surface of intake manifold assembly.
- Replace intake manifold gasket if it is damaged during installation.

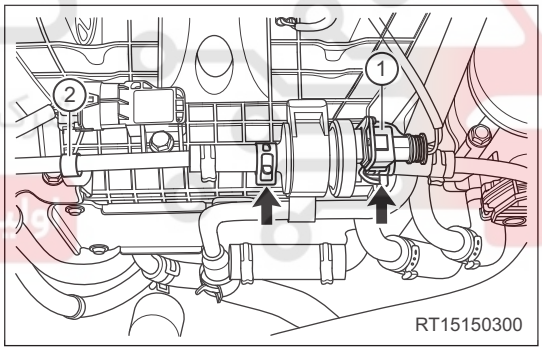
Intake Manifold Assembly (1.5 TCI + DCT)

Removal

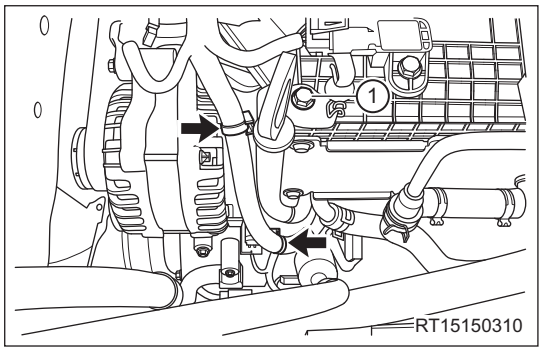
CAUTION

- Temperature of engine compartment is very high when engine is running. Before removal, make sure that engine has stopped running 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.

1. Release the fuel system pressure (See page 12-26).
2. Turn off all electrical equipment and the engine switch.
3. Disconnect the negative battery cable.
4. Remove the engine trim cover.
5. Remove the fuel rail injector assembly (See page 12-26).
6. Remove muffler assembly and muffler hose (See page 16-14).
7. Remove the electronic throttle assembly (See page 16-20).
8. Remove the canister solenoid valve assembly.
   a. Disconnect the charcoal canister solenoid valve connector (1).
   b. Loosen elastic clamps (arrow) and disconnect connection between fuel vapor hose and charcoal canister solenoid valve.
   c. Remove fuel vapor hose from fixing clip (2).

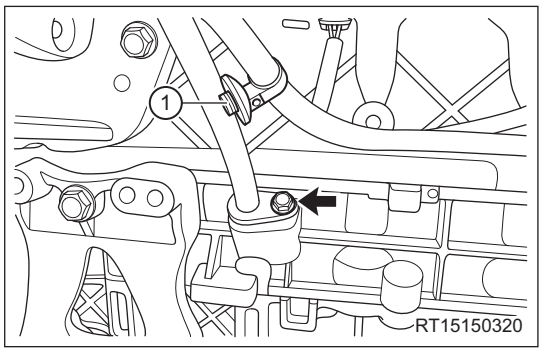


   d. Remove the canister solenoid valve assembly.
9. Remove the oil dipstick tube assembly.
   a. Remove the engine wire harness fixing clips (arrow).
   b. Remove coupling bolt (1) between oil dipstick tube and intake manifold assembly.



c. Remove the engine wire harness fixing clip (1).

d. Remove coupling bolt (arrow) between oil dipstick tube and cylinder block frame assembly.



e. Remove the oil dipstick tube assembly.

10. Remove the intake manifold assembly.

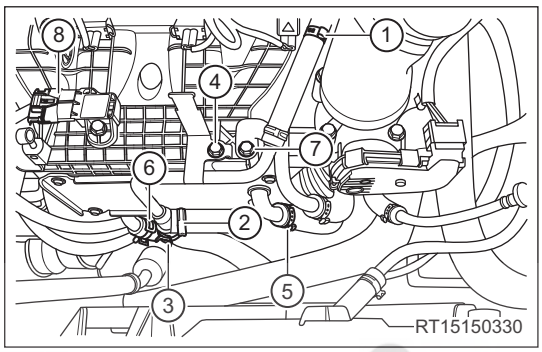
a. Loosen clamping ring (1) and disconnect connection between outlet pipe set and intercooler outlet pipe set.

b. Loosen clamping ring (2) and disconnect connection between intercooler outlet pipe set and intercooler assembly.

c. Loosen elastic clamp (3) and disconnect connection between intercooler outlet pipe set and low temperature radiator inlet pipe set.

d. Remove intercooler outlet pipe set fixing bolt (4), and remove intercooler outlet pipe set.

(Tightening torque: 8 + 3 N·m)



e. Loosen clamping ring (5) and disconnect connection between inlet pipe set and intercooler assembly.

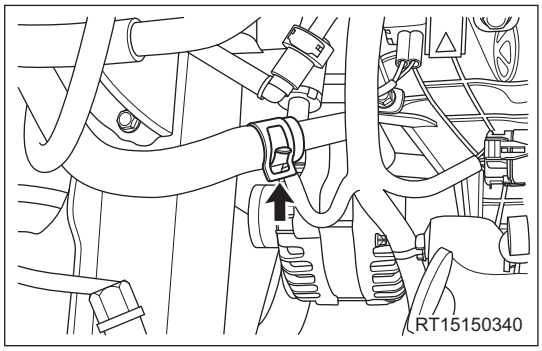
f. Loosen elastic clamp (6) and disconnect connection between inlet pipe and low temperature radiator outlet pipe set.

g. Remove fixing bolt (7) from brake vacuum pipe bracket.

(Tightening torque: 8 + 3 N·m)

h. Disconnect the intake pressure/temperature sensor connector (8).

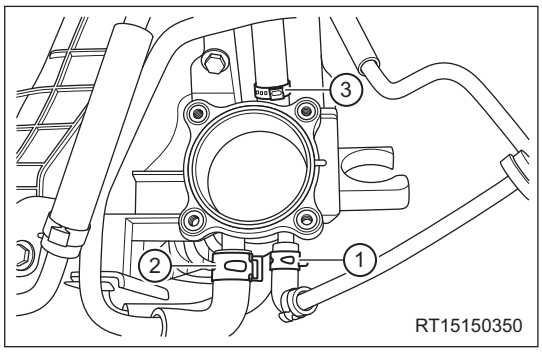
i. Loosen elastic clamp (arrow) and disconnect connection between expansion tank outlet pipe set and inlet pipe.



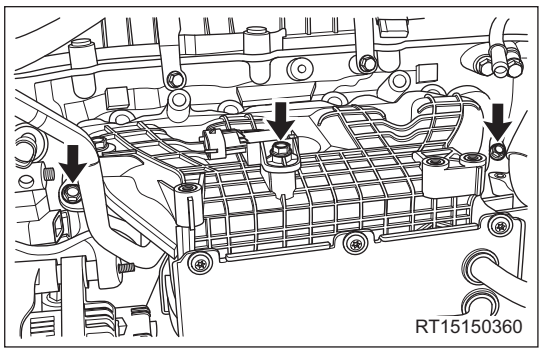
j. Loosen elastic clamp (1) and disconnect connection between fuel vapor input line and intake manifold assembly.

k. Loosen elastic clamp (2) and disconnect connection between brake vacuum pipe and intake manifold assembly.

l. Loosen clamping ring (3), and disconnect connection between crankcase vent tube and intake manifold assembly.



m. Remove 3 fixing bolts (arrow) from intake manifold assembly.
(Tightening torque: 20 + 5 N·m)

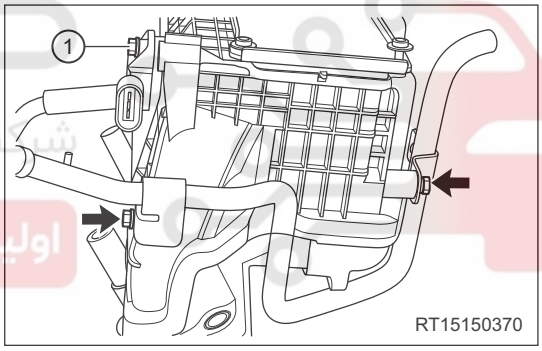


n. Remove the intake manifold assembly.

11. Remove intake pressure/temperature sensor and inlet pipe.

a. Remove 2 fixing bolts (arrow) from inlet pipe.
(Tightening torque: 8 + 3 N·m)

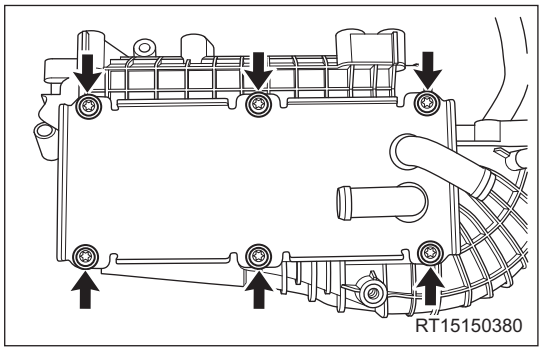
b. Remove fixing bolt (1) from intake pressure/temperature sensor.
(Tightening torque: 7 ± 1 N·m)



c. Remove intake pressure/temperature sensor and inlet pipe.

12. Remove the intercooler assembly.

a. Remove 6 fixing bolts (arrow) from intercooler.

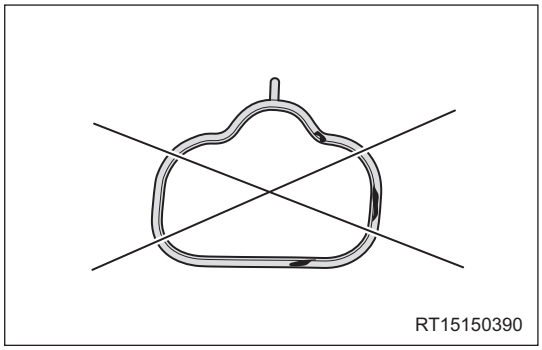


b. Remove intercooler assembly and gasket.

Inspection

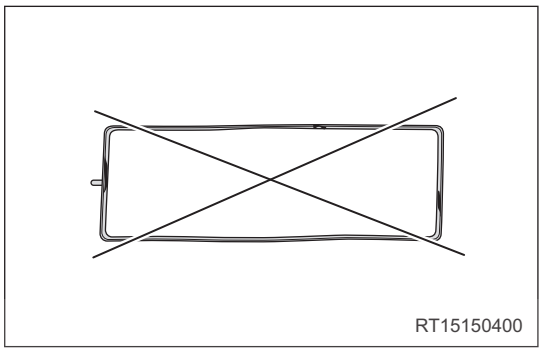
1. Check the intake manifold gasket.

   Check intake manifold gasket, and replace if it is deteriorated or damaged.

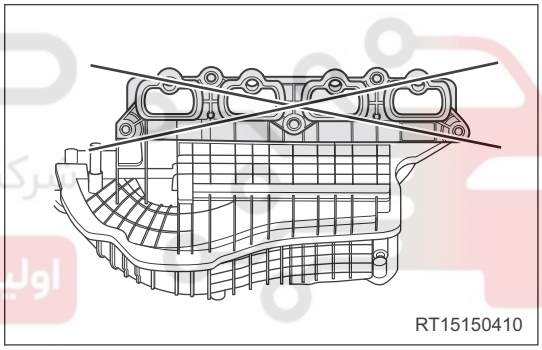


2. Check the intercooler gasket.

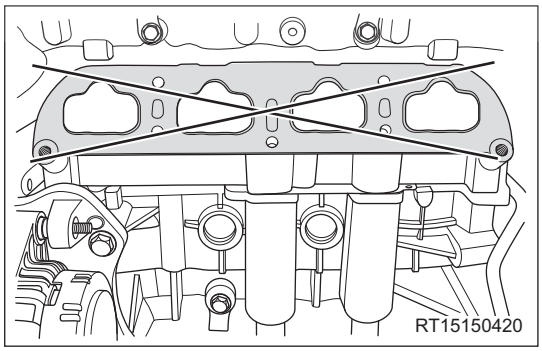
   Check intercooler manifold gasket, and replace if it is deteriorated or damaged.



3. Check flatness of intake manifold mounting surface.
   a. Clean and check contact surface between intake manifold assembly and cylinder head.
   b. Using a precision straightedge and feeler gauge, check intake manifold flatness. If warpage on the surface is greater than 0.8 mm, replace intake manifold assembly.



4. Check warpage on cylinder head surface of intake manifold installation side.
   a. Clean and check contact surface between intake manifold assembly and cylinder head.
   b. Measure warpage on cylinder head side surface with a precision ruler and a feeler gauge. If warpage on the surface is greater than 0.04 mm, replace cylinder head assembly.



Installation

Installation is in the reverse order of removal.

CAUTION

- Clean fitting surface of intake manifold assembly.
- Replace intake manifold gasket if it is damaged during installation.

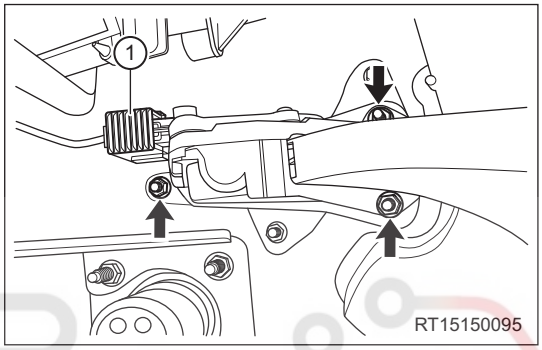
Electronic Accelerator Pedal

Removal

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 switch.
2. Disconnect the negative battery cable.
3. Remove the electronic accelerator pedal.
   a. Disconnect the electronic accelerator pedal connector (1).
   b. Remove 3 fixing nuts (arrow) from electronic accelerator pedal.
      (Tightening torque: 9 ± 1.5 N·m)



   c. Remove the electronic accelerator pedal.

Installation

Installation is in the reverse order of removal.

- MEMO -