

Environmental Precautions

Overview

The information provided herein helps to reduce the impact of workshop activities on the environment.

Emissions to Air

Many of the activities carried out in the workshop emit harmful gas and fume which contribute to global warming, depletion of the ozone layer and/or formation of photochemical smog at ground level. By considering how the workshop activities are carried out, these gases and fumes can be controlled to a minimum, thus reducing the impact on the environment.

Exhaust Gas

Running car engines is an essential part of workshop activities and shall be carried out in a well-ventilated environment. However, the operating time of the engine and the parking position of the vehicle should be carefully considered at any time, so as to control the release of harmful gases and minimize the inconvenience to people in nearby.

Solvents

Some of the detergent used are solvent based, of which the liquid will evaporate into the atmosphere if not used properly or if containers keep unsealed. All solvent containers should be firmly closed when not needed and solvent should be used sparingly. Suitable alternative materials may be used to replace some of the commonly used solvents. Similarly, many paints are solvent based and the spray should be minimized to reduce solvent emissions.

Refrigerant

Discharge and replacement of refrigerant from air conditioning system should only be carried out by using the correct equipment.

Engine

Always observe the followings:

- Minimize unnecessary operation of the engine;
- Minimize testing times and check where the fume comes from.

Diluent:

- Cap the containers of solvents;
- Only use the minimum quantity.
- Consider alternative materials.
- Minimize over-spray when painting.

Gas:

- Use the proper equipment to collect refrigerants.
- Don't burn rubbish on site.

Water Discharge

Oil, petrol, solvent, acids, hydraulic oil, antifreeze and other such substances should never be poured down the drain and every precaution must be taken to prevent spillage reaching the drains.

Handling of such materials must take place well away from the drains and preferably in an area with a kerb or wall around it, to prevent discharge into the drain. If any spill occurs, it is possible to absorb the spilled liquid immediately. Having a spill kit available will make this easier.

Precautions

Always observe the following disposal and spillage prevention instructions.

- Never pour any liquid into a drain without first checking that it is environmentally safe to do so, and that it does not contravene any local regulations.
- Store liquids in a walled area;
- Make sure that caps on liquid containers are secure and cannot be accidentally turned on;
- Protect bulk storage tanks from damage and abuse by locking the valves;
- Sealed pipelines are preferred to transfer liquids from one container to another;
- Ensure lids are replaced securely on containers;
- Have spill kits available near to the spot of storage and handling of liquids.

Spill Kits

Special materials are available to absorb different liquids. They can be in granule form, ready to use and contained in containers convenient for use. Disposal of used spill-absorbing material is described in the "Waste Management" section.

Land Contamination

Oils, fuels, solvents, etc. can contaminate any soil that they contact, therefore, never pour such materials onto the soil. Every precaution must be taken to prevent spillage reaching soil. Wastes materials stored on open ground could also leak, or may contaminate the land due to washout of contaminants. Always store these materials in suitable robust containers.

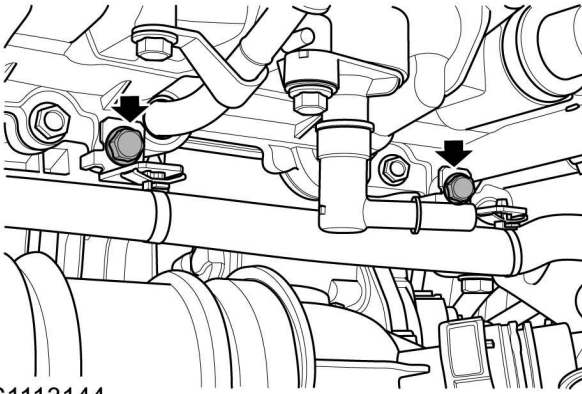
Precautions

Always observe the followings:

- Do not pour or spill anything onto the soil or bare ground.
- Don't place waste materials on bare ground.

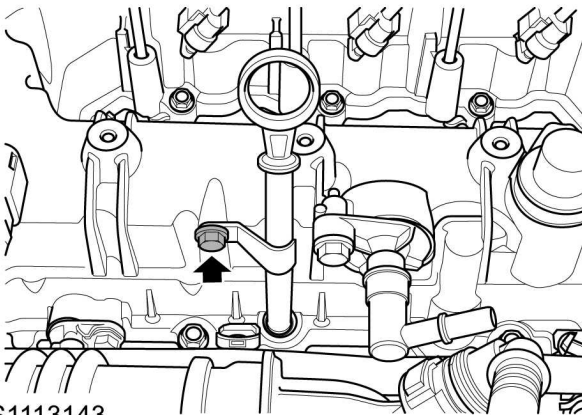
Local Issues

A number of environmental issues will become special concerns for the residents and other neighbours around the



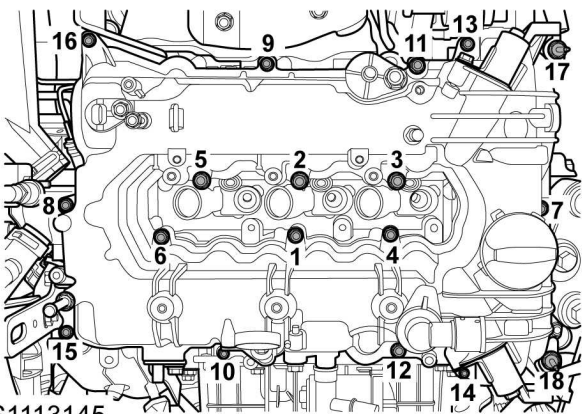
S1113144

13. Remove the dipstick.
14. Remove 1 bolt fixing the dipstick tube to the camshaft cover and remove the dipstick tube.



S1113143

15. Remove 18 bolts fixing the camshaft cover to the cylinder head in the sequence shown.

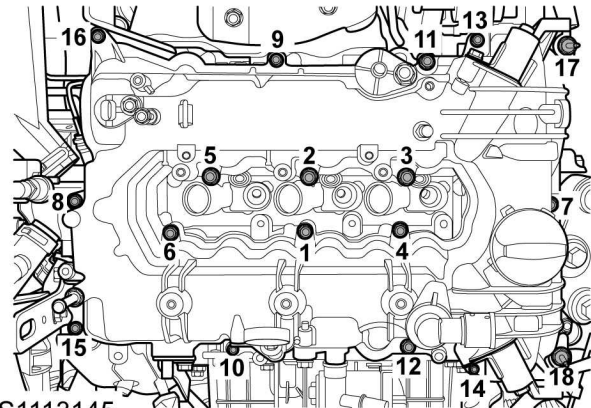


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16. Remove the camshaft cover and discard the seal gasket.

Refit

1. Fit a new camshaft cover seal gasket.
2. Locate the camshaft cover to the cylinder head, fit 16 bolts and 2 studs, tighten to **10-14Nm** in the sequence shown, and check the torque.



S1113145

3. Fit dipstick tube and 1 bolt fixing dipstick tube to camshaft cover, tighten to **8-12Nm** and check the torque
4. Fit the oil dipstick.
5. Fit 2 bolts fixing the 2 engine harness brackets to the camshaft cover, tighten to **8-12Nm** and check the torque
6. Fix the harness staple bolt to the camshaft cover.
7. Fix 2 PCV valve assemblies to the camshaft cover respectively, fit 1 bolt individually, tighten to **8-12Nm** and check the torque.
8. Fit the PCV breather tube pipeline B. Connect the 3 nozzles (2) of the PCV breather pipeline B.
9. Fit the crankcase ventilation pipeline A and connect the 3 nozzles of crankcase ventilation pipeline A (1)
10. Fit the turbocharger water return pipe.

Turbocharger Water Return Pipe Refit

11. Fit vacuum pump.

Vacuum Pump Refit

12. Fit the camshaft position sensor.

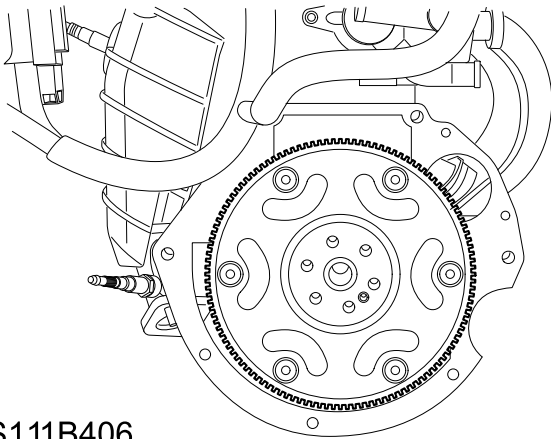
Camshaft Position Sensor Refit

13. Fit the camshaft phase adjustment actuator solenoid.

Camshaft Phase Adjustment Actuator Solenoid Refit

14. Fit the fuel injector.

Fuel Injector Refit



Crankshaft Pulley

Remove

1. Disconnect the battery negative.
2. Raise the front of the vehicle.

Warning: Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

3. Remove the camshaft cover.

 Camshaft Cover Remove

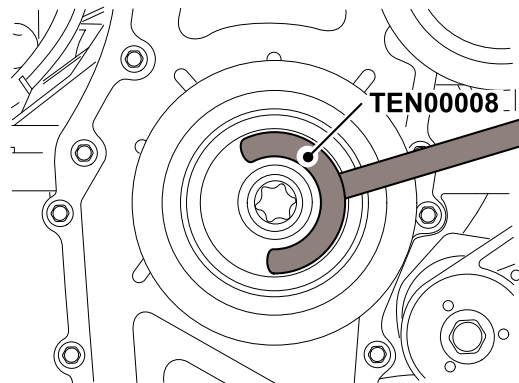
4. Remove the right front wheel.

 Wheel Remove

5. Remove auxiliary drive belt.

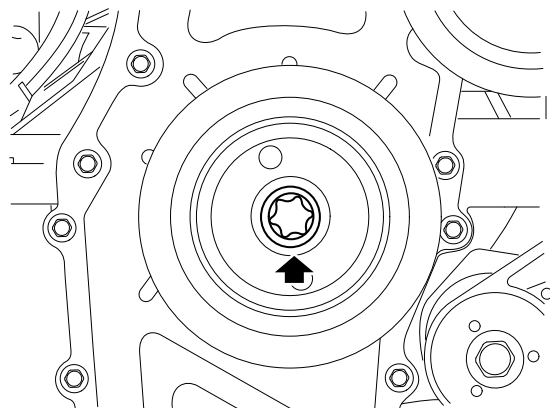
 Auxiliary Drive Belt Remove

6. Fix the crankshaft pulley with the TEN00008.



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7. Loosen and remove the bolt fixing the pulley to the crankshaft, and discard the bolt.



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8. Remove the crankshaft pulley.

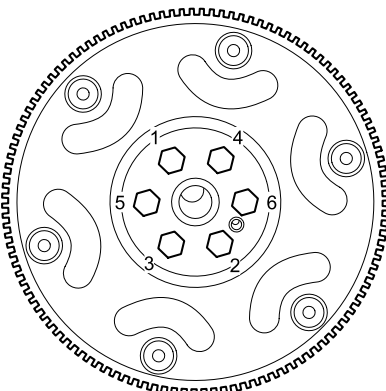
Caution: Avoid damaging the crankshaft front oil seal lip when removing the pulley.

S111B406

7. Remove the special tool TEN00002 for flywheel timing pin.

Refit

1. Use a saw to make two saw cuts on the bolt removed from the drive plate at an angle of 45° to the bolt shank, and clean the bolt hole on the crankshaft with the sawed bolt.
2. Clean the mating face of the drive plate and the crankshaft.
3. Fit the drive plate to the crankshaft.
4. Fit the new glue bolts, but do not tighten them.
5. Rotate the drive plate, when the flywheel mounting pin of the crankshaft is horizontally aligned with the air intake side, insert the flywheel timing pin special tool TEN00002 into the engine block timing hole to lock it up.
6. Tighten the bolt to 35Nm+60° using a diagonal sequence.



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7. Remove the special tool TEN00002 of the drive plate timing pin.
8. Refit the plug.
9. Fit the automatic transmission.

 Automatic Transmission Refit

Engine mechanical system-1.5L-S Eur

Specifications

Torque

Description	Value
Bolt-MT Mounting to Mounting Bracket	50Nm+90deg
Nut-MT Mounting to Mounting Bracket	50Nm+90deg
Bolt-ENG Mounting to ENG	55–65Nm
Bolt-BRACKET-PT MTG LWR TIE to Automatic Transmission	50N.m+90deg
Nut-Medium Muff to Catalysts	19-25Nm
Bolt-Transmission Mounting to Body	90–110Nm
Bolt-Transmission Mounting to Body	55–65Nm
Bolt-ENG Mounting to Body	90–110Nm
Bolt-ENG Mounting to Body	55–65Nm
Bolt-Flywheel to Crankshaft	35Nm+60°
Bolt-Torsion Vibration Damper to Crankshaft	60Nm+120°
Bolt - cover upper front to cylinder head	8-12Nm
Bolt - cover lower front to cylinder block and crankcase lower	8-12Nm
Bolt - water pump pulley to water pump	23-27Nm
Bolt - engine mounting bracket to cylinder body	40-50 Nm
Bolt - engine mounting bracket to cylinder body	40Nm+60Deg
Bolt-Chain Guide Rail And Chain Tensioner Rail	20-24Nm
Bolt - chain guide rail upper to cylinder head front cam bearing	8-12Nm
Bolt - timing chain tensioner to cylinder head	18-22Nm+(22-28°)
Bolt - oil pump procket to oil pump	22-28Nm
Bolt-Cam Bearing Cap to Cylinder Head	7-10Nm
Bolt - ignition coil	8-12Nm
Bolt-Cam Bearing Cap to Cylinder Head	7-11Nm
Bolt - VCT unit to camshaft	70-80Nm
Bolt - cylinder head to cylinder block	30Nm+ (90°+60°)
Bolt - patch cylinder head to cylinder block	8-12Nm
Bolt - thermostat to cylinder head	8-12Nm
Bolt - crankcase lower to cylinder block	27-33Nm
Bolt -Connecting Rod	(13-17)Nm+ (77-83) °
Bolt-Piston Cooling Jets to Crankcase	22-28Nm
Bolt - bearing cap to cylinder block	(20±2)Nm+ (90°+45°) ±5°
plug blanking-plug blanking to crankcase	35-45 Nm
Bolt - bearing cap to cylinder block	8-12Nm
Bolt - oil pump to crankcase lower	8-12Nm
Bolt -baffle plate to crankcase lower	8-12Nm
Bolt - ocv to cylinder head	5-7Nm
Oil filter	16-20Nm
Plug - crankcase lower	35-40Nm

Service Procedures

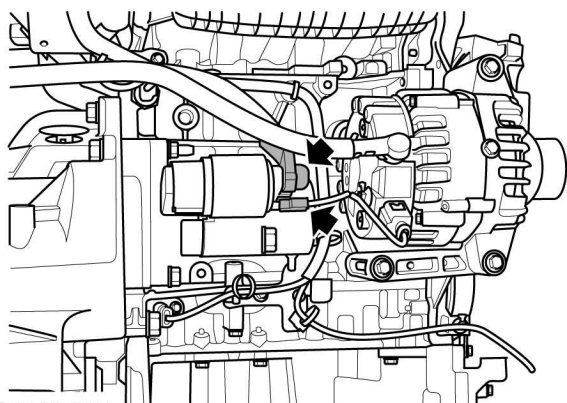
Starter

Remove

1. Disconnect the battery negative.
2. Remove the bottom deflector.

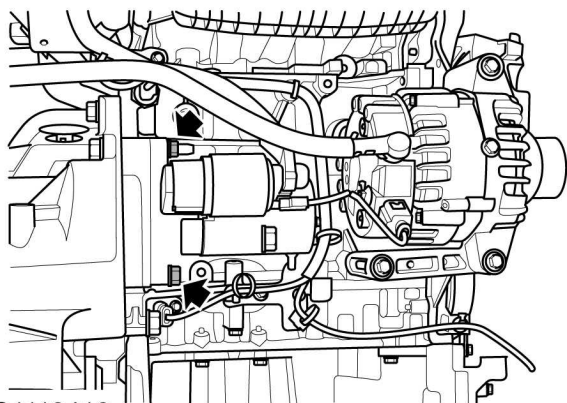
Bottom Deflector Remove

3. Disconnect the harness connector of the starter solenoid.
4. Remove 1 nut fixing the battery wire to the starter, and disconnect the battery wire.



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5. Remove 1 bolt and 1 nut fixing the starter to the cylinder block.



S1113416

6. Remove the starter.

Refit

1. Fix the starter to the engine cylinder block, fit 1 bolt, tighten to **40-50Nm**, check the torque, fit 1 nut and then tighten it to **40-50Nm**.
2. Connect the battery wire to the starter, fit 1 nut, tighten to **11-15Nm**, and check the torque.
3. Connect the starter connector.
4. Fit the bottom deflector.

Bottom Deflector Refit

5. Connect the battery negative.

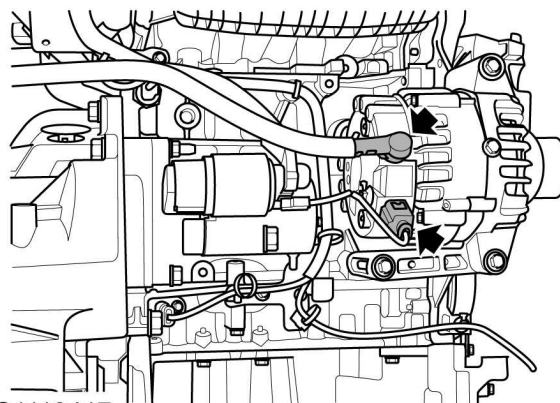
Alternator

Remove

1. Disconnect the battery negative.
2. Remove the auxiliary drive belt.

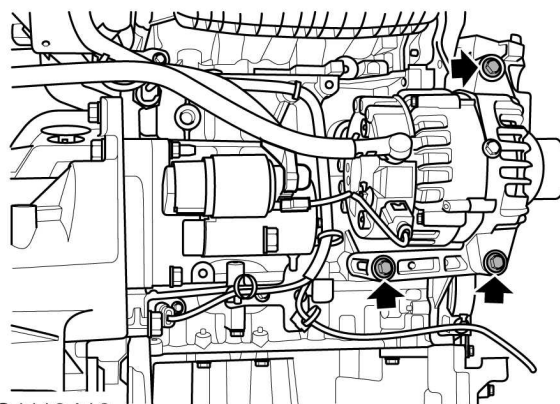
Auxiliary Drive Belt Remove

3. Disconnect the alternator harness connector.
4. Remove 1 nut fixing the power cord onto the alternator and take away the power cord.



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5. Remove 3 bolts fixing the alternator onto the alternator mounting bracket.



S1113418

6. Remove the alternator.

Refit

1. Fix the alternator onto the mounting bracket, fit 3 bolts, tighten to **19-25Nm** and check the torque.
2. Connect the power cord to the alternator, fit 1 nut, tighten to **11-15Nm** and check the torque.
3. Connect the alternator harness connector.
4. Fit the auxiliary drive belt.

Auxiliary Drive Belt Refit

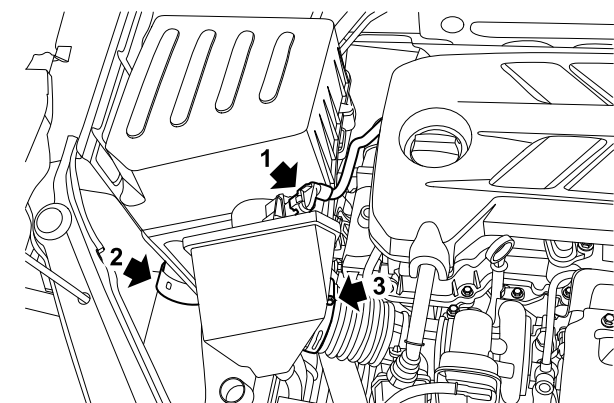
5. Connect the battery negative.

Service Procedures

Air Filter Assembly

Remove

1. Disconnect the negative battery cable.
2. Disconnect the harness connector (1) from the air flow meter.
3. Disconnect the junction (2) of the air filter inlet pipe and the air filter assembly.
4. Remove 1 bolt (3) fixing the air filter outlet pipe to the air filter assembly.



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5. Remove the air filter assembly.

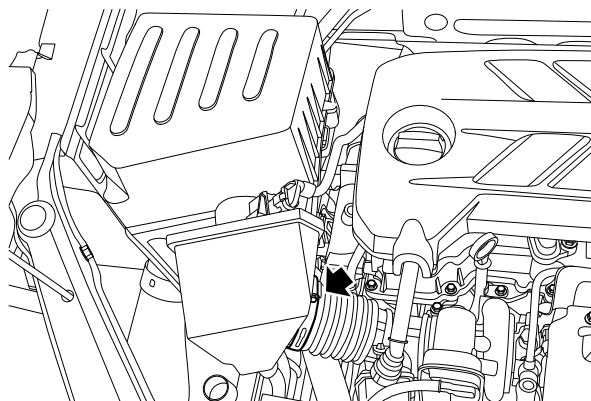
Refit

1. Fit 1 bolt fixing the air filter outlet pipe to the air filter assembly, tighten it to **5-6Nm**, and check the torque.
2. Connect the junction of the air filter inlet pipe and the air filter assembly.
3. Connect the harness connector to the air flow meter.
4. Connect the negative battery cable.

Air Filter Element

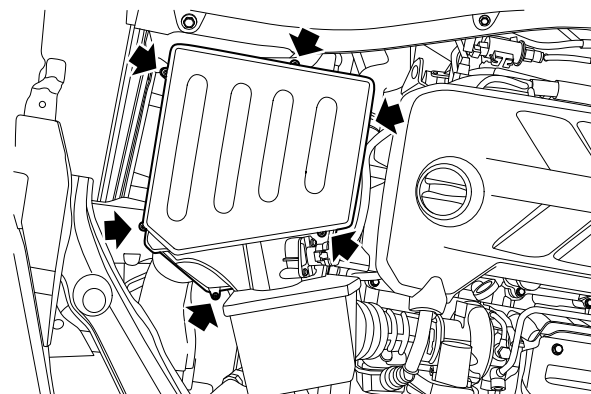
Remove

1. Disconnect the negative battery cable.
2. Remove 1 bolt fixing the air filter outlet pipe to the metal clamp of the air filter assembly.



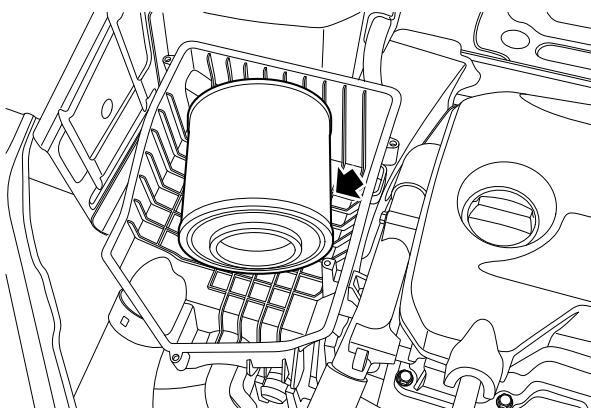
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3. Disconnect the harness connector from the air flow meter.
4. Remove 6 screws fixing the upper cover of the air filter to the lower cover of the air filter.



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5. Remove the air filter element.



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Refit

1. Fit a new air filter element.

Service Procedures

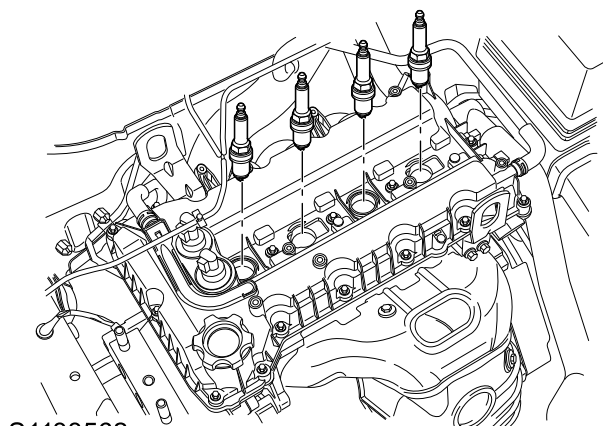
Spark Plug

Remove

1. Disconnect the battery negative.
2. Remove the ignition coil.

Ignition Coil Remove

3. Clean the area around the spark plug. Remove the dust around the spark plug with high pressure gas.
4. Remove 4 spark plugs with the spark plug socket.



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Refit

1. Identify the model of the original spark plug before fitting a new one. Spark plug of the same model shall be selected for replacement.
2. Adjust the initial gap of each new spark plug to 0.80-0.90mm.
3. Fit the spark plug and tighten it to **22-28Nm**.
4. Fit the ignition coil.

Ignition Coil Refit

5. Connect the battery negative.

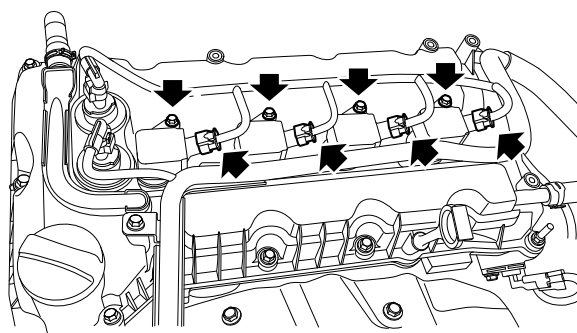
Ignition Coil

Remove

1. Disconnect the battery negative.
2. Remove the air filter assembly.

Air Filter Assembly Remove

3. Disconnect the harness connector and the bolt.



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4. Hold the end of the ignition coil rubber bush, and pull out the ignition coil from the spark plug (if difficult to pull out, you can rotate the ignition coil right and left to loosen it).

Refit

1. Fit the ignition coil onto the spark plug, and connect the harness connector.
2. Tighten the bolts fixing the ignition coil to **8-12Nm**
3. Connect the high voltage wire to the spark plug.
4. Fit the air filter assembly.

Air Filter Assembly Refit

5. Connect the battery negative.

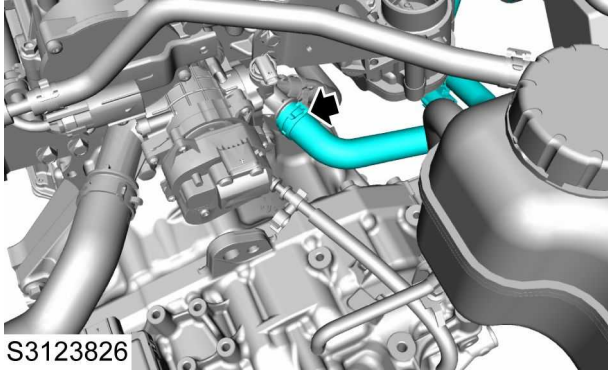
Heater Water Inlet Pipe - I.3T

Remove

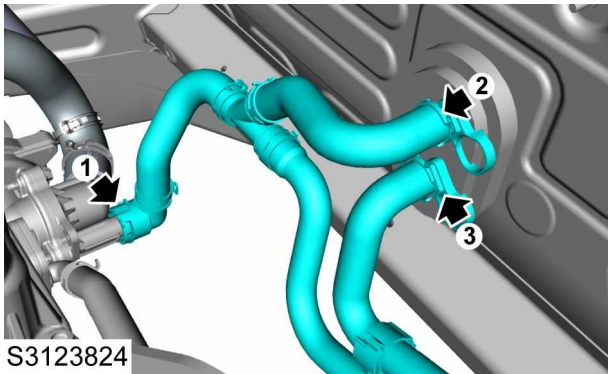
1. Disconnect the negative battery cable.
2. Drain the coolant.

Coolant - Drain and Refill

3. Loosen the clamp and disconnect the heater core water inlet pipe from the engine.



4. Loosen the clamp (3), and disconnect the heater core water inlet pipe from the heater core.



5. Loosen the clip, and remove the heater core water inlet pipe.

Refit

1. Fit the heater core water inlet pipe and secure it with clips.
2. Connect the heater core water inlet pipe to the heater core, and secure it with clamps.
3. Connect the heater core water inlet pipe to the engine, and secure it with clamps.
4. Refill the coolant.

Coolant - Drain and Refill

5. Connect the negative battery cable.

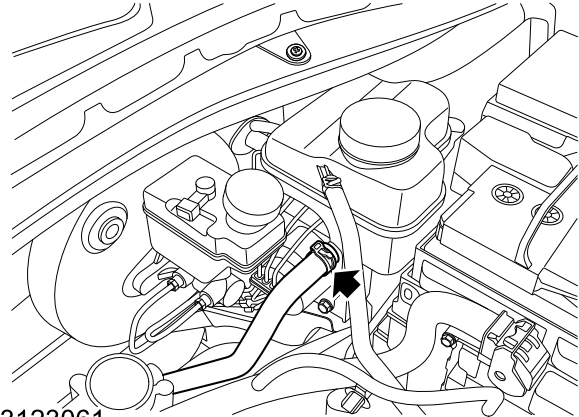
Heater Water Outlet Pipe - I.3T

Remove

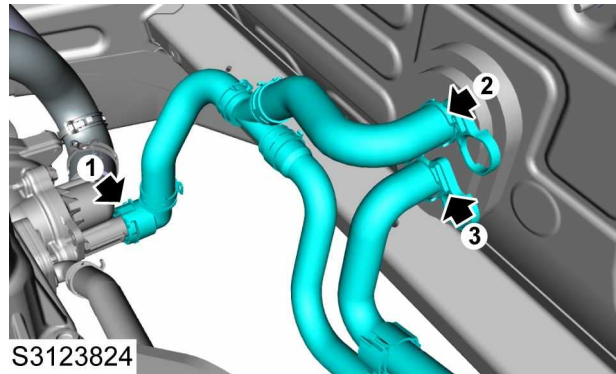
1. Disconnect the negative battery cable.
2. Drain the coolant.

Coolant - Drain and Refill

3. Loosen the clamp, and disconnect the heater core water outlet pipe from the expansion tank.



4. Loosen the clamp (1), and disconnect the heater core water outlet pipe from the engine.
5. Loosen the clamp (2), and disconnect the heater core water outlet pipe from the heater core.



6. Loosen the clip, and remove the heater core water outlet pipe.

Refit

1. Fit the heater core water outlet pipe and secure it with clips.
2. Connect the heater core water outlet pipe to the heater core, and secure it with clamps.
3. Connect the heater core water outlet pipe to the engine, and secure it with circlips.
4. Connect the heater core water outlet pipe to the expansion tank, and secure it with clamps.
5. Refill the coolant.

Coolant - Drain and Refill

6. Connect the negative battery cable.

Fuel System - Pressure Test - 1.3T

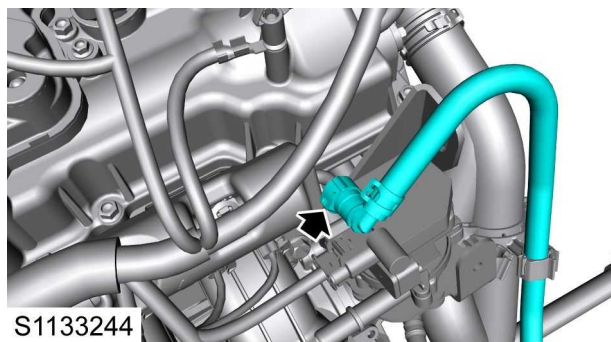
Check

1. Place a piece of absorbent cloth around the fuel rail to collect the spilled fuel.

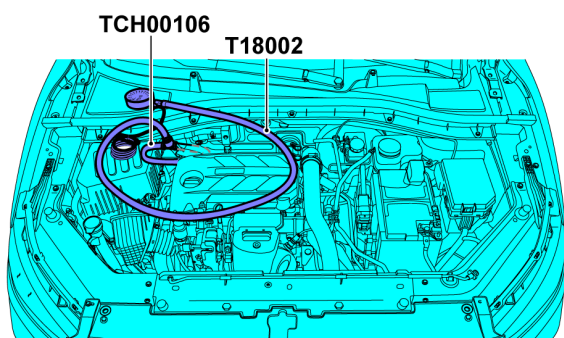
Warning: Fuel vapour is highly flammable and in confined spaces is also explosive and toxic. Always have a fire extinguisher containing foam, CO2, gas or powder close

Warning: The spilling of fuel is unavoidable during this operation. Ensure that all necessary precautions are taken to prevent fire and explosion.

2. Disconnect the fuel supply pipe from the fuel rail.



3. Respectively connect the fuel rail quick connector and the fuel supply pipe to the quick connector of **TCH00106**.
4. Fix **TCH00106** to the fuel pressure gauge **TI8002**.



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5. Start the engine to allow the fuel pump to work, observe the readings on the fuel pressure gauge within a minute; if the readings are in the range of 4.2-4.9 bar, it indicates that the fuel system is normal.
6. Stop the engine to stop the fuel pump; if the system pressure drops below 2.5 bar after 20 minutes, it indicates that there is something wrong with the system pressure maintaining, so check the pressure regulating valve of the fuel pump for normal operation.
7. Respectively disconnect the pipeline of fuel rail and fuel inlet pipe from the **TCH00106**.
8. Drain the remaining fuel from the tool to the container.
9. Connect the pipeline of fuel rail and fuel inlet pipe.

Fuel System - Pressure Test - 1.5L

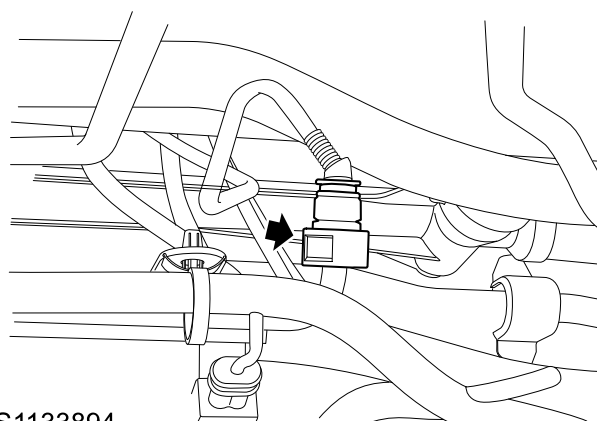
Check

1. Place a piece of cloth with a strong absorptivity around the fuel rail to collect the spilled fuel.

Warning: Fuel vapour is highly flammable and in confined spaces is also explosive and toxic. Always have a fire extinguisher containing foam, CO2, gas or powder close

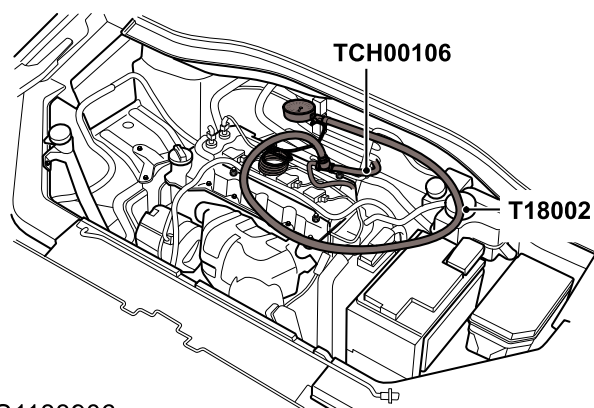
Warning: The spilling of fuel is unavoidable during this operation. Ensure that all necessary precautions are taken to prevent fire and explosion.

2. Disconnect the fuel rail quick connector from the fuel supply pipe.



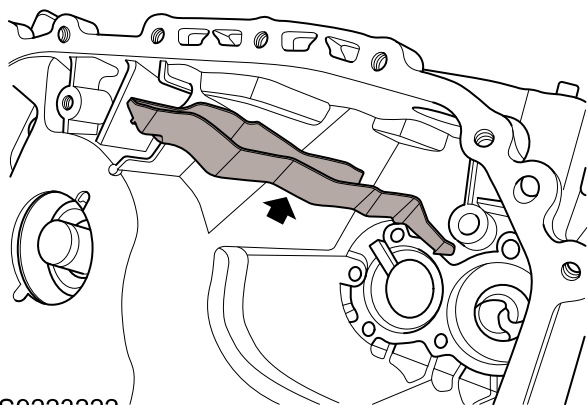
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3. Connect the fuel rail quick connector and the fuel supply pipe connector to the **TCH00106** quick connector.
4. Fix the **TCH00106** to the fuel pressure gauge **TI8002**.



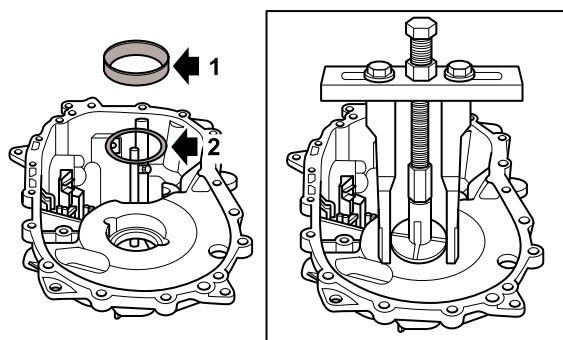
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5. Start the engine to allow the fuel pump to work, observe the readings on the fuel pressure gauge within 1 minute. If the readings are in the range of 3.5-4.2bar, the fuel system is in normal state.
6. Stop the engine to stop the fuel pump. If the system pressure declines below 2bar after 20 minutes, it indicates that there is something wrong with system pressure maintaining. Please check the fuel pump



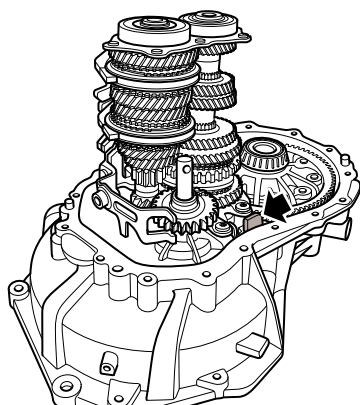
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10. Remove the rear housing differential bearing outer ring (1).
11. Remove the differential bearing outer ring gasket (2) and discard it.



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12. Remove the magnet from the transmission.

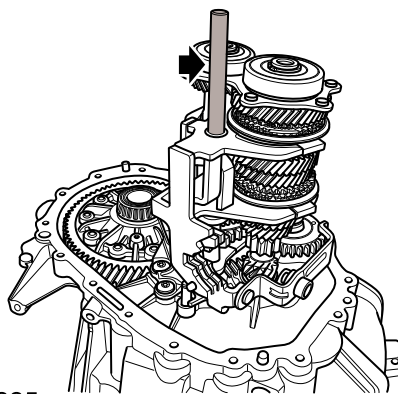


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13. Remove the reverse idler gear assembly.

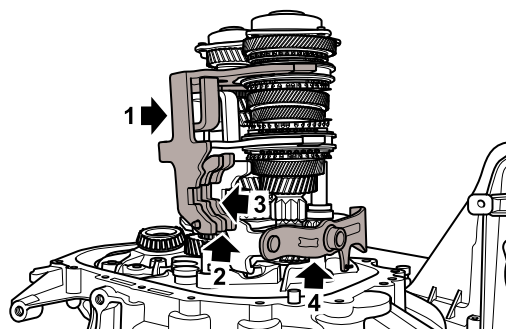
Reverse Idler Gear Assembly Remove

14. Remove the shifting fork shaft.



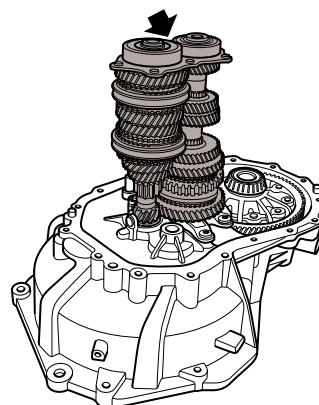
S9223225

15. Remove the shifting forks (1), (2), (3) and (4) of the 5-6 gear, 4-3 gear, 2-1 gear and reverse gear.



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16. Remove the reverse gear return spring.
17. Remove the input shaft and output shaft assembly.



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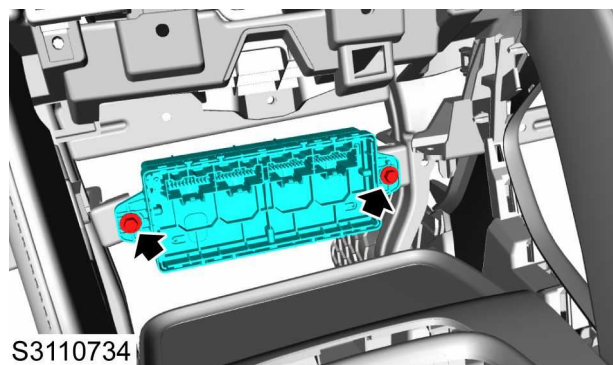
18. Remove the retaining bolt of the output shaft front bearing plate (1), discard it, and remove the main bearing front bearing plate (2).

Service Procedures**A/C Controller Assembly - ETC****Remove**

1. Disconnect the negative battery cable.
2. Remove the instrument panel assembly.

 Instrument Panel Assembly Remove

3. Disconnect the connector of the A/C controller assembly.
4. Remove 2 bolts fixing the A/C controller assembly to the instrument panel beam, and remove the A/C controller assembly.

**Refit**

1. Fix the A/C controller assembly to the instrument panel beam, fit 2 screws, tighten them to **2–4Nm**, and check the torque.
2. Connect the connector of the A/C controller assembly.
3. Fit the instrument panel assembly.

 Instrument Panel Assembly Refit

4. Connect the negative battery cable.

Evaporator Core Temperature Sensor**Remove**

1. Remove the heater core assembly.

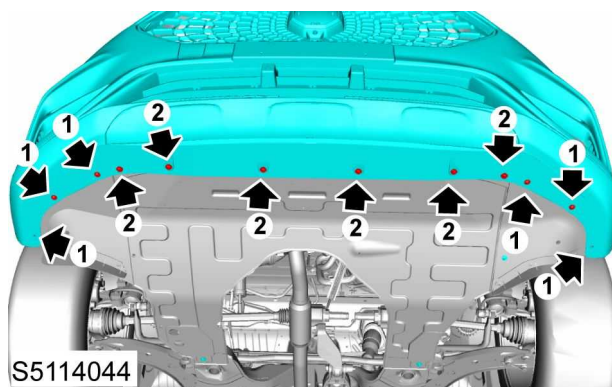
 Heater Core Assembly Remove

2. Remove the screw and clip fixing the vent box to the heater box, and remove the vent box.
3. Remove the screw and clip of the heater box to separate the heater box.
4. Remove the evaporator core temperature sensor.

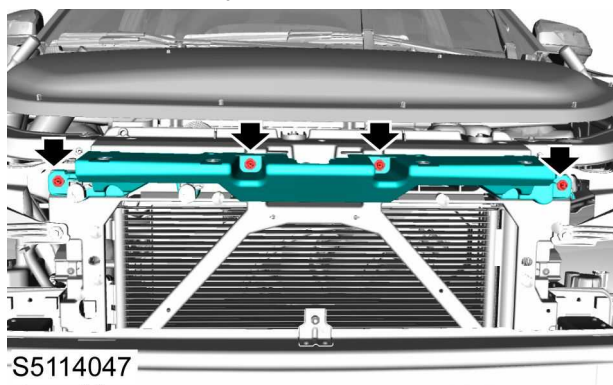
Refit

1. Fit the evaporator temperature sensor.
2. Fit the heater box and secure it with screws and clips.
3. Fix the vent box to the heater box and secure it with screws and clips.
4. Fit the heater core assembly.

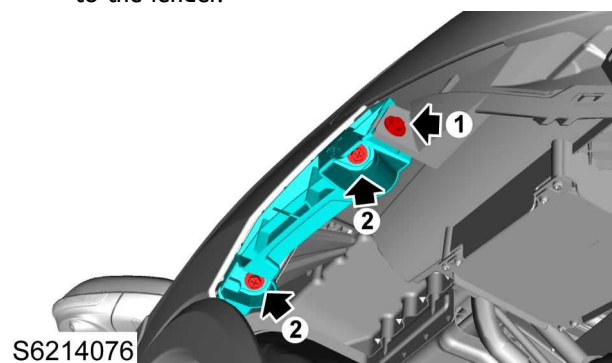
 Heater Core Assembly Refit



10. Disconnect the harness connector.
11. Remove the front bumper.
12. If the front bumper middle bracket is required to be removed, remove 4 bolts fixing the front bumper middle bracket to the front-end module, and remove the front bumper middle bracket.



13. If the front bumper side bracket is required to be removed, remove 1 bolt (1) fixing the headlamp to the front bumper side bracket.
14. Remove 2 bolts (2) fixing the front bumper side bracket to the fender.



Refit

1. If the front bumper side bracket has been removed, fix the front bumper side bracket to the fender, fit 2 bolts, tighten them to **3–5Nm**, and check the torque.
2. Fit 1 bolt fixing the headlamp to the front bumper side bracket, tighten it to **3–4Nm**, and check the torque.
3. If the front bumper middle bracket has been removed, fix the front bumper middle bracket to the front-end module, fit 4 bolts, tighten them to **3–4Nm**, and check

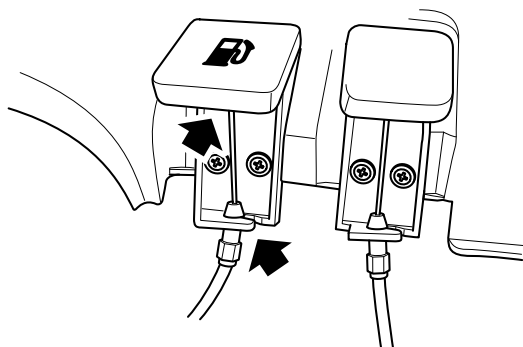
the torque.

4. Connect the harness connector, and fix the front bumper to the body.
5. Fit 6 screws fixing the front bumper to the bottom deflector, tighten them to **1.4–1.8Nm**, and check the torque.
6. Fit 6 screws fixing the front bumper to the left and right wheelhouse liners, tighten them to **1.4–1.8Nm**, and check the torque.
7. Fit 4 bolts fixing the front bumper to the front bracket, tighten them to **3–4Nm**, and check the torque.
8. Fit 4 split pins fixing the front bumper cover plate to the front-end module.
9. Fit 3 screws fixing the front wheelhouse liner to the front bumper, tighten them to **1.4–1.8Nm**, and check the torque.
10. Fit 1 screw fixing the front bumper to the fender, tighten it to **3–4Nm**, and check the torque.
11. Fix the front wheel eyebrow to the body, and press the clip in place.
12. Close the bonnet.
13. Connect the negative battery cable.

Fuel Filler Flap Cable Assembly

Remove

1. Pull the fuel filler release handle on the driver side lower trim panel and open the fuel filler flap.
2. Release the fuel filler flap cable assembly from the fuel filler flap release handle.



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3. Remove the left A pillar lower trim panel.

A Pillar Lower Trim Panel Remove

4. Remove the left door doorsill trim panel.

Doorsill Trim Panel Remove

5. Remove the right door doorsill trim panel.

Doorsill Trim Panel Remove

6. Remove the right D pillar lower trim panel.

D pillar Lower Trim Panel Remove

7. Remove the right trunk side trim panel.

Trunk Side Trim Panel Assembly Remove

8. Lift the trunk carpet to expose the cable assembly, and release the cable from the electrical harness clip.
9. Disconnect the shutter from the body, and draw the fuel filler flap from the fuel filler flap cable assembly.

Refit

1. Fit the small end of the shutter manual cable assembly to the trunk through the fuel filler flap and the hole on the side panel, push the shutter into the hole along the hole axis till it clicks and clips at both sides of the shutter are completely stuck into the side panel.
2. Fit the cable assembly to the rear of the rear seat through the right trunk, and fix the cable to the clip of the electrical harness (near the instrument panel) along the left door sill, then fit the cylindrical end of the cable assembly into the notch of the handle under the instrument panel.
3. Pull the fuel filler flap release handle at the driver side lower trim panel, check the connection of the shutter manual cable assembly.

4. Arrange the carpet in the trunk.
5. Fit the right trunk side trim panel.

Trunk Side Trim Panel Assembly Refit

6. Fit the right D pillar lower trim panel.

D pillar Lower Trim Panel Refit

7. Fit the right door doorsill trim panel.

Doorsill Trim Panel Refit

8. Remove the left door sill trim panel.

Doorsill Trim Panel Refit

9. Fit the left A pillar lower trim panel.

A Pillar Lower Trim Panel Refit

10. Close the fuel filler flap.

Gasket Pasting Position Information

