Chapter 4 Part C: Fuel system - multi-point fuel injection engines

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Degrees of difficulty

<table>
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<th>Suitable for</th>
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<tr>
<td>Easy</td>
<td>novice with little experience</td>
</tr>
<tr>
<td>Fairly easy</td>
<td>beginner with some experience</td>
</tr>
<tr>
<td>Fairly difficult</td>
<td>competent DIY mechanic</td>
</tr>
<tr>
<td>Difficult</td>
<td>experienced DIY mechanic</td>
</tr>
<tr>
<td>Very difficult</td>
<td>expert DIY or professional</td>
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Specifications

General

System type: Rear-mounted fuel tank, electric fuel pump, multi-point fuel injection system

System application:
- XU9J 1/Z, XU9J 1/L
- XU9J A/Z, XU9J A/L

Bosch LE2-J etronic
- Bosch LU2-J etronic
- Bosch Motronic M1.3

Fuel system data

- Regulated fuel pressure: 2.9 to 3.1 bar
- Fuel pump delivery: 540 cc/15 sec
- Idling speed: 900 ± 50 rpm
- Idle mixture CO content*: 1.0 to 2.0%

*Adjustable on LE2-J etronic system only - controlled by ECU on all other systems

Recommended fuel

- Minimum octane rating (see text Section 8): 95 RON unleaded or 97/98 RON unleaded*

*Note: The XU9J A engine should not be operated on 95 RON unleaded petrol

1 General information and precautions

General information

The fuel supply system consists of a fuel tank (which is mounted under the rear of the car, with an electric fuel pump immersed in it), a fuel filter, fuel feed and return lines. The fuel pump supplies fuel to the fuel rail, which acts as a reservoir for the four fuel injectors which inject fuel into the inlet tracts. The fuel filter incorporated in the feed line from the pump to the fuel rail ensures that the fuel supplied to the injectors is clean.

Refer to Section 9 for further information on the operation of each fuel injection system.

Precautions

Warning: Petrol is extremely flammable - great care must be taken when working on any part of the fuel system. Do not smoke or allow any naked flames or uncovered light bulbs near the work area. Note that gas-powered domestic appliances with pilot flames, such as heaters, boilers and tumble dryers, also present a fire hazard - bear this in mind if you are working in an area where such appliances are present. Always keep a suitable fire extinguisher close to the work area and familiarise yourself with its operation before starting work. Wear eye protection when working on fuel systems and wash off any fuel spilt on bare skin immediately with soap and water. Note that fuel vapour is just as dangerous as liquid fuel; a vessel that has just been emptied of liquid fuel will still contain vapour and can be potentially explosive. Petrol is a highly dangerous and volatile liquid, and the precautions necessary when handling it cannot be overstressed.

Many of the operations described in this Chapter involve the disconnection of fuel lines, which may cause an amount of fuel spillage. Before commencing work, refer to the above Warning and the information in “Safety first” at the beginning of this manual.

When working with fuel system components, pay particular attention to cleanliness - dirt entering the fuel system may cause blockages which will lead to poor running.
**Note:** Residual pressure will remain in the fuel lines long after the vehicle was last used. When disconnecting any fuel line, first depressurise the fuel system as described in Section 4.

### 2 Air cleaner assembly - removal and refitting

**Removal**
1. Disconnect the inlet and outlet ducts.
2. Unscrew the mounting bolts and lift the air cleaner from the engine.

**Refitting**
3. Refitting is a reversal of removal.

### 3 Throttle cable - removal, refitting and adjustment

**Removal**
1. Extract the spring clip from the adjustment ferrule located beneath the inlet manifold. Release the cable end fitting from the linkage the outer cable from the support bracket.
2. Working inside the car, disconnect the cable end fitting from the top of the accelerator pedal arm.
3. Withdraw the throttle cable through the bulkhead grommet.

**Refitting and adjustment**
4. Refitting is a reversal of removal, but adjust the cable as follows.
5. Remove the spring clip from the adjustment ferrule then, ensuring that the throttle cam is fully against its stop, gently pull the cable out of its grommet until all free play is removed from the inner cable.
6. With the cable held in this position, ensure that the flat washer is pressed securely against the grommet, then fit the spring clip to the third ferrule groove visible in front of the rubber grommet and washer.
7. Have an assistant depress the accelerator pedal and check that the throttle cam opens fully and returns smoothly to its stop.

### 4 Fuel system - depressurisation

**Note:** Refer to the warning note in Section 1 before proceeding.

**Warning:** The following procedure will merely relieve the pressure in the fuel system - remember that fuel will still be present in the system components, and take precautions accordingly before disconnecting any of them.

### 5 Fuel pump - removal and refitting

Refer to Part B, Section 5.

### 6 Fuel gauge sender unit - removal and refitting

Refer to Part A, Section 6.

### 7 Fuel tank - removal and refitting

Refer to Part A, Section 7, noting that it will be necessary to depressurise the fuel system as the feed and return hoses are disconnected from the fuel pump which is located inside the tank. It will also be necessary to disconnect the wiring connector from the fuel pump before lowering the tank out of position.

### 8 Unleaded petrol - general information and usage

**Note:** The information given in this Chapter is correct at the time of writing. If updated information is thought to be required, check with a Peugeot dealer. If travelling abroad, consult one of the motoring organisations (or a similar authority) for advice on the fuel available.

### 9 Fuel injection systems - general information

#### Bosch LE2-J etronic system

A roller type electric pump located in the fuel tank pumps fuel through the filter to the injectors via a fuel distribution rail. The electronic control unit (ECU) which is triggered by the ignition circuit sends impulses to the injectors which operate simultaneously and inject fuel in the vicinity of the inlet valves. The electronic control unit is provided with sensors to determine engine temperature, speed and load, and the quantity of air entering the engine. This information is computed to determine the period of injection.

For cold starting, additional fuel is provided and, to compensate for this, additional air is provided by a supplementary air device.

#### Bosch LU2-J etronic system

The principle of operation of the LU2-J etronic system is similar to that described above for the LE2-J etronic system, the only significant difference is that the LU2-J etronic system incorporates an oxygen sensor in the exhaust system. This enables the ECU to carry out fine fuel mixture adjustment, to allow the use of a catalytic converter.
adjustments described in the following subsections which represent the limit of work that can be done without sophisticated test equipment. If problems still exist, the vehicle should be taken to a suitably-equipped Peugeot dealer for testing. A wiring block connector is incorporated in the engine management circuit, into which a special electronic diagnostic tester can be plugged. The tester will locate the fault quickly and simply, alleviating the need to test all the system components individually, which is a time-consuming operation that also carries a risk of damaging the ECU.

**Checks and adjustment**

**Idle speed and mixture CO content**

1. Refer to Chapter 1.

**Throttle initial position - LE2-J etronic system**

1. Run the engine to normal operating temperature - indicated when the electric cooling fan has cut in and out twice. The ignition timing must be correctly adjusted, as described in Chapter 5B.
2. Connect a vacuum gauge to the test point in the distributor vacuum advance line (see illustration).
3. Check that the throttle movement is smooth.
4. With the engine stopped turn the air screw fully in (see illustration).
5. Prise the tamperproof cap from the throttle stop screw (arrowed) and adjust as described in text.
6. Unscrew the throttle stop screw then retighten it until it just touches the throttle lever. Tighten the screw a further four complete turns.
7. Start the engine and allow it to idle. Turn the throttle stop screw to obtain an idle speed of 650 rpm (XU5J engines) or 600 rpm (XU5J A and XU9J A engines). Check that the vacuum reading shown on the gauge does not exceed 50 mm Hg (65 mbar) and if necessary adjust the throttle stop screw.
8. Now turn the air screw in the throttle housing as necessary to obtain the specified idling speed.
9. Stop the engine and adjust the throttle switch, as described below.
Check the full throttle operation by connecting an ohmmeter between terminals 18 and 3, then fully opening the throttle so that dimension X is 4.0 mm (see illustration). The ohmmeter should read zero.

If the switch does not operate correctly it should be renewed.

**Throttle switch - LU2-J electronic and Motronic M1.3 systems**

The throttle initial position must be correct before attempting to adjust the throttle switch.

Slacken the throttle switch securing screws.

Turn the switch unit fully clockwise, then turn it slowly back until the idling contacts are heard to close.

Tighten the securing screws.

Pull the wiring from the switch, then connect an ohmmeter between terminals 2 and 18 in the switch (see illustration). The ohmmeter should read infinity.

Operate the throttle linkage, and the ohmmeter should read infinity.

If the readings are not correct, repeat the procedure described in paragraphs 26 to 30 inclusive.

Connect the ohmmeter between switch terminals 3 and 18. The ohmmeter should read infinity.

Fully open the throttle, and the ohmmeter should read zero.

If the specified readings cannot be obtained, renew the switch.

Reconnect the switch wiring plug on completion.

**Fuel injectors**

Refer to the warning note in Section 1 before proceeding. Ensure that the working area is clean before removing the injectors, and ensure that no dirt is allowed to enter the system during the procedure. No attempt should be made to overhaul the injectors. If a fuel or contamination is suspected, seek specialist advice.

Disconnect the battery negative lead.

Disconnect the wiring plugs from the fuel injectors, labelling them if necessary to ensure correct refitting.

Disconnect the vacuum hose from the top of the fuel pressure regulator.

Unscrew the four bolts securing the fuel rail to the inlet manifold (two upper bolts, and two bolts at the right-hand end of the rail), then carefully lift the rail, complete with pressure regulator and fuel injectors, from the inlet manifold, taking care not to strain any of the hoses or pipes.

To remove a fuel injector from the fuel rail, carefully remove the metal securing clip, then pull the injector from the rail. Be prepared for fuel spillage, and take adequate precautions.

Refitting is a reversal of removal, but fit new injector O-rings.

**Fuel pressure regulator**

Refitting is a reversal of removal, but use new O-rings when refitting the pressure regulator to the fuel rail, and where applicable, use new injector O-rings.

**Throttle position switch**

Disconnect the battery negative lead.

Release the securing clip and disconnect the wiring plug from the switch.

Remove the two securing screws, then withdraw the switch from the throttle body.

Refitting is a reversal of removal, but on completion, adjust the switch as described in Section 10.

**Throttle housing**

Disconnect the battery negative lead.

Release the securing clip, and disconnect the wiring plug from the throttle position switch.

Loosen the securing clamp, and disconnect the air trunking from the front of the throttle housing.

Disconnect the throttle cable, with reference to Section 3.

Disconnect the vacuum and/or breather hoses from the throttle housing, noting their locations to ensure correct refitting.

Unscrew the three throttle housing securing nuts, and recover the washers. Remove the throttle cable bracket from the top throttle housing securing stud, noting its orientation.

Withdraw the throttle housing from the inlet manifold.

Refitting is a reversal of removal, bearing in mind the following points:

a) Ensure that the vacuum and/or breather hoses are correctly reconnected, as noted before removal.

b) After refitting the throttle housing, check the adjustment of the throttle cable, as described in Section 3.

c) On completion, if any work has been carried out on the housing, check the adjustment of the throttle switch, as described in Section 10.

**Supplementary air (cold start) device**

Remove the battery as described in Chapter 5A.

Disconnect the air hoses then unbolt the airflow sensor and bracket. Disconnect the wiring.

Unscrew the supplementary air device bracket nuts and disconnect the wiring.

Tilt the assembly and coolant outlet housing (without disconnecting the coolant hoses) and remove the concealed mounting bolt.

Disconnect the air hoses, then remove the remaining mounting bolt and withdraw the unit.

Refitting is a reversal of removal.
12 Inlet manifold - removal and refitting

**Note:** The following procedure is applicable to all three multi-point fuel injection systems, but slight differences in component layout may be encountered.

**Removal**
1. Disconnect the battery negative lead.
2. Slacken the retaining clip, then disconnect the inlet duct from the throttle housing and recover the sealing ring.
3. Disconnect the throttle inner cable from the throttle cam, then withdraw the outer cable from the mounting bracket, along with its flat washer and spring clip.
4. Depress the retaining clip and disconnect the wiring connector from the throttle position switch.
5. Release the retaining clips (where fitted) and disconnect all the relevant vacuum and breather hoses from the manifold. Make identification marks on the hoses to ensure that they are connected correctly on refitting.
6. Bearing in mind the information given in Section 4, slacken the retaining clips and disconnect the fuel feed and return hoses from the fuel rail.
7. Depress the retaining tangs and disconnect the wiring connectors from the four injectors. Free the wiring from any relevant retaining clips and position it clear of the manifold.
8. Where necessary, undo the retaining bolts and remove the support bracket from the underside of the manifold.
9. Undo the manifold retaining nuts and withdraw the manifold from the engine compartment. Recover the four manifold seals and discard them; new ones must be used on refitting.

**Refitting**
10. Refitting is a reverse of the relevant removal procedure, noting the following points:
   a) Ensure that the manifold and cylinder head mating surfaces are clean and dry, then locate the new seals in their recesses in the manifold.
   b) Ensure that all relevant hoses are reconnected to their original positions and are securely held (where necessary) by the retaining clips.
   c) Adjust the throttle cable as described in Section 3.