RETURNLESS FUEL SYSTEM INTEGRAL WITH M. MARELLI I.A.W. - 49F.D1 INJECTION-IGNITION SYSTEM

Foreword

This section only deals with parts not fitted to the previous 1242 version. Please refer to this version for further information.

Introduction

Unlike the control unit fitted to the previous version, the control unit on the I.A.W. - 49F.D1 injection-ignition system fitted to the 1242 MPI 8V version is connected to the electrical system via two separate connectors. One of these is connected to the engine wiring and the other is connected to the front wiring.
This control unit belongs to the category of digital electronic ignitions with static advance and static distribution. It is integral with an electronic phased, multipoint intermittent fuel injection system.
Its function is to inject an exact quantity of fuel upstream of the intake valve. The fuel mixes with the air introduced into the cylinder in order to achieve the correct mixture concentration.
The system ensures operational efficiency in order to optimise performance and fuel consumption while reducing harmful emissions by responding in real time to different engine service conditions.
Lastly, the I.A.W. - 49F injection-ignition system does not require adjustment because it is self-regulating and self-adaptive.

System operating strategies

The control unit memory contains a management program. This special software is made up of a series of strategies, each of which controls a specific system function.
Each strategy uses input from sensors to process a series of parameters on the basis of data maps stored in the control unit and then controls system actuators (output). The actuators are devices that allow the engine to operate.

Injection management

The injection end pulse or delivery timing is contained ina map stored in the control unit. This parameter varies according to engine rpm and pressure in the intake manifold.
In practice, the control uint processes data to open the four injectors (one per cylinder) in sequence for the length of time strictly necessary to achieve an air-fuel mixture as close as possible to a stoichiometric ratio.
Fuel is injected directly into the manifold near the intake valves at a pressure of 3.5 bar.

Self-adaptability

The control unit adapts mixture concentration automatically by means of a special function. This function stores differences between baseline mapping and corrections imposed by the lambda probe that occur persistently during service.
These discrepancies (due to system and engine component ageing) are stored permanently so that system operation can adapt as engine and component specifications gradually change in time.
Use the appropriate tester function to delete stored corrections.
Corrections are NOT lost when the battery or control unit are disconnected.
The strategy is disabled during the period when the fuel vapour cut-off valve is open.

If the control unit is replaced, it is advisable to leave the engine idling for a few minutes (engine warm) to allow the control unit to store the corrections again.
Corrections at higher speeds are stored during normal driving conditions. The control unit is also fitted with a self-adaptive function that corrects engine idle speed actuator opening according to changes as a result of leaks through the throttle body or natural engine ageing. This specific correction is lost when the battery or control unit are disconnected.

Starting and post - starting

When the engine is started up, engine timing cannot be instantly recognised and it is not therefore possible to implement phased injection for the first injection pulse into each cylinder.
During the first engine revolutions, an initial simultaneous injection is therefore carried out (full-group) because the considerable fluctuations in engine speed do not allow injection phase to be calculated correctly. Injection only becomes phased at a later stage.

Cut-off operation

The fuel cut-off strategy is implemented when the control unit recognises that the throttle valve is in idle position (throttle potentiometer signal) and engine speed exceeds 1613 rpm at 20 °C and 1300 at 90 °C.
The control unit enables fuel cut-off only when engine temperature exceeds 0 °C.
When the ECU recognises that the throttle valve is not closed or idle speed is lower than 1513 rpm at 20 °C and 1200 at 90 °C, the fuel supply to the engine is restored.
At very high speeds, fuel is cut-off even when the throttle valve is not fully closed but the pressure in the intake manifold is particularly low (partial cut-off).

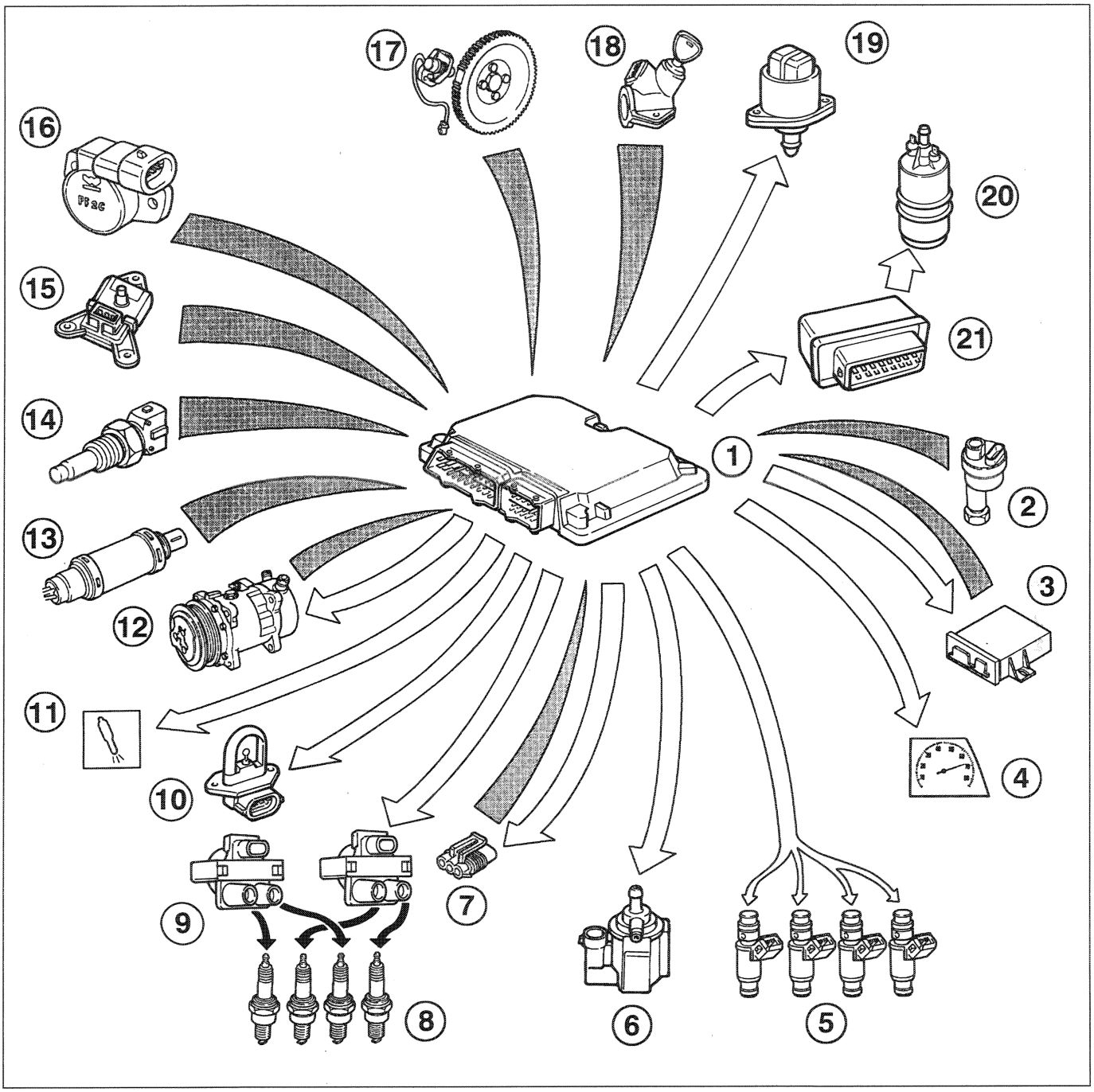
ENGINE IMMOBILISER FUNCTION MANAGEMENT (Fiat CODE)

The injection-ignition system comprises an engine immobiliser function.
A special control unit (Fiat CODE) is able to exchange signals with the I.E. control unit and an electronic key with sending unit, which transmits a recognition code.
Whenever the key is turned to STOP, the Fiat CODE system completely deactivates the injection-ignition control unit.
When the key is turned to MAR, the following operations taken place in sequence:

1. The injection ECU (with a secret code in its memory) instructs the Fiat CODE control unit to transmit a secret code in order to deactivate the immobiliser;
2. The FIAT CODE control unit may respond by transmitting the secret code only after it has received a recognition code from the ignition key;
3. Secret code recognition permits deactivation of the injection-ignition ECU lock and normal system operation.

NOTE *Due to the presence of the Fiat CODE system, DO NOT CARRY OUT tests and/or operational checks using another injection-ignition control unit. In this case, the FIAT CODE control unit would transfer the recognition code (unknown) to the test injection-ignition ECU, which would therefore be unusable on any other car.*

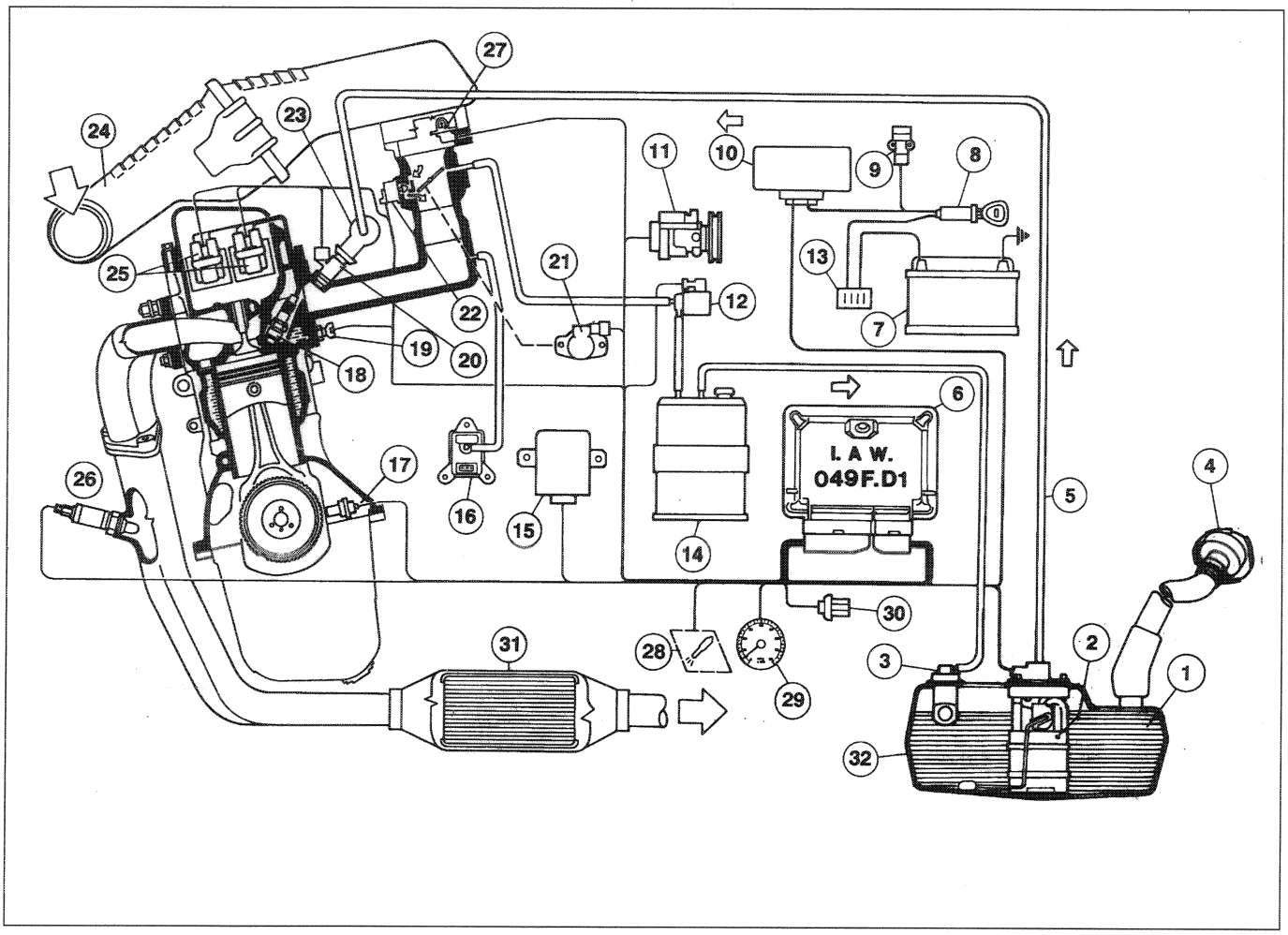
DIAGRAM SHOWING INFORMATION FLOW BETWEEN CONTROL UNIT AND INJECTION - IGNITION SYSTEM SENSORS / ACTUATORS



P3M03MJ01

1. Electronic control unit
2. Speedometer sensor
3. FIAT CODE control unit
4. Rev counter
5. Injectors
6. Fuel vapour solenoid
7. Diagnostic socket
8. Spark plugs
9. Ignition coils
10. Air temperature sensor
11. Injection warning light
12. Climate control system
13. Lambda probe
14. Engine coolant temperature sensor
15. Intake air pressure sensor
16. Throttle position sensor
17. Rpm and TDC sensor
18. Ignition switch
19. Engine idle speed actuator
20. Electric fuel pump
21. Multiple relay

INJECTION-IGNITION SYSTEM OPERATING DIAGRAM



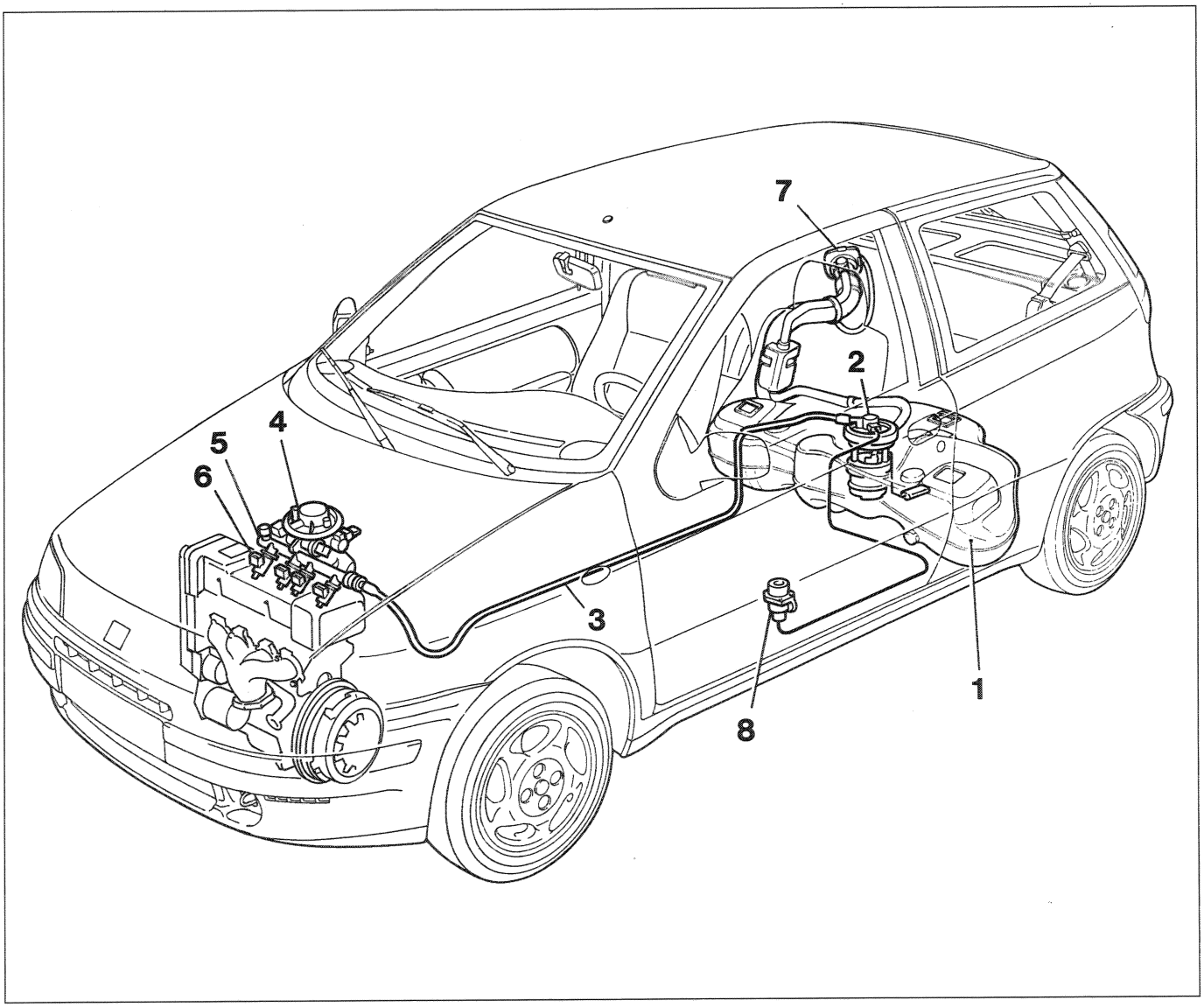
P3M04MJ01

1. Fuel tank
2. Electric fuel pump (includes filter, pressure regulator, level gauge)
3. Multifunction valve
4. Safety valve
5. Fuel delivery line
6. Electronic injection-ignition control unit
7. Battery
8. Ignition switch
9. Inertia switch
10. Dual relay
11. Heating/ventilation system
12. Fuel vapour cut-off solenoid
13. Injection-ignition system fuse
14. Active carbon trap filter
15. FIAT CODE control unit
16. Absolute pressure sensor
17. Rpm and TDC sensor.
18. Spark plugs
19. Coolant temperature sensor
20. Injectors
21. Throttle valve position sensor
22. Idle speed actuator
23. Fuel supply manifold
24. Air cleaner
25. Ignition coils
26. Lambda probe
27. Intake air temperature sensor
28. System warning light
29. Rev counter
30. Diagnostic socket
31. Catalytic converter
32. Fuel tank

RETURNLESS FUEL SUPPLY CIRCUIT

The fuel supply circuit on this car differs from the fuel system on the previous version in lacking a fuel return line to the tank.
This solution minimises the risk of the car catching fire in the case of an accident and also reduces fuel vapour emissions into the atmosphere.
The system is made even more safe by the fact that the fuel filter and pressure regulator are incorporated in the fuel pump.

Location of returnless fuel system components

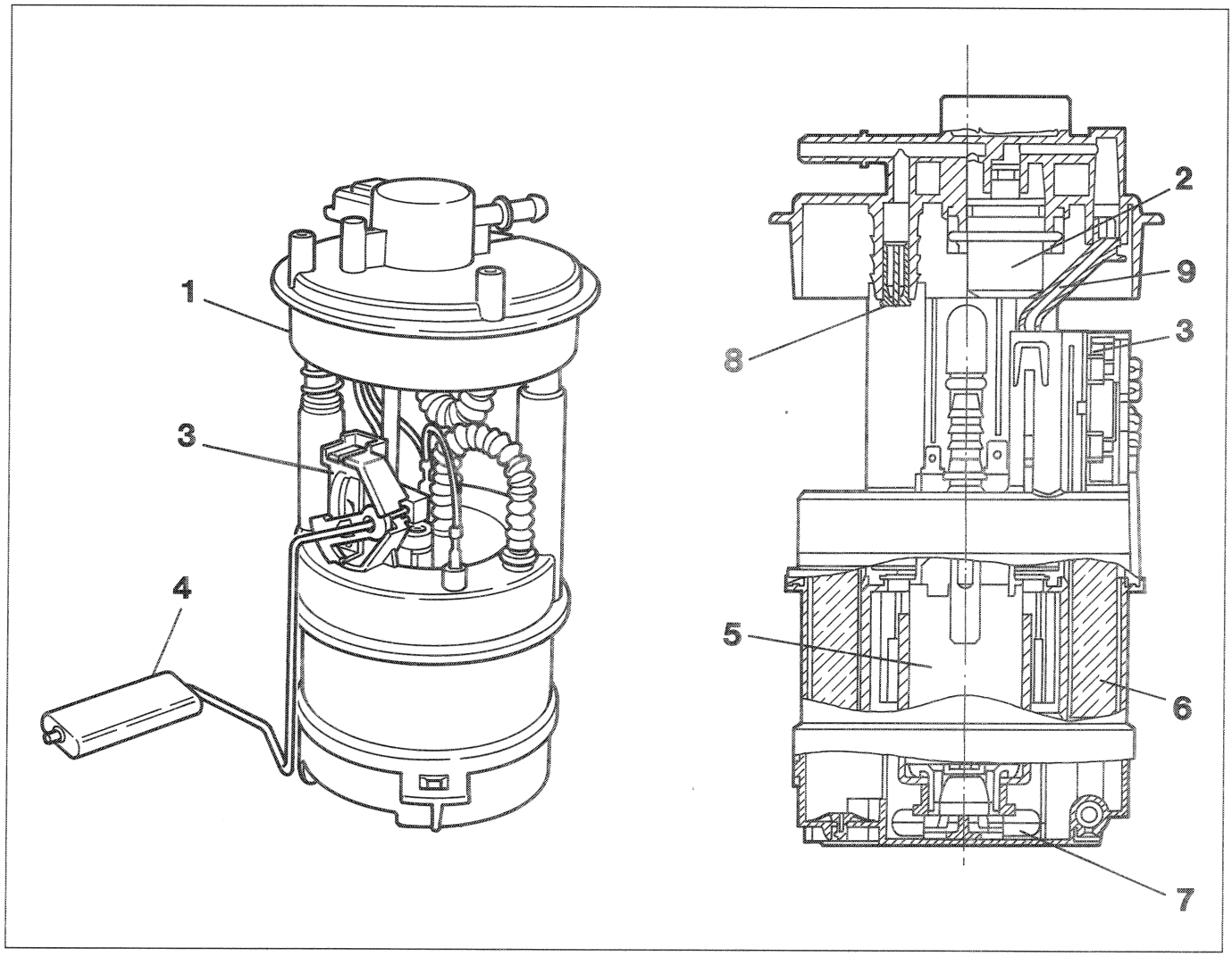


P3M05MJ01

1. Fuel tank
2. Electric fuel pump (includes filter, pressure regulator and level gauge)
3. Fuel delivery line
4. Throttle case
5. Fuel manifold
6. Injectors
7. Two-way safety valve
8. Inertia safety switch

PUMP/FUEL LEVEL GAUGE UNIT

The unit assembly comprises a pump with pre-filter, filter, pressure regulator and fuel level gauge with contact strips.



P3M06MJ01

1. Pump unit
2. Regulator
3. Level gauge
4. Float
5. Electric fuel pump
6. Fuel filter
7. Pre-filter
8. Check valve
9. Fuel return duct

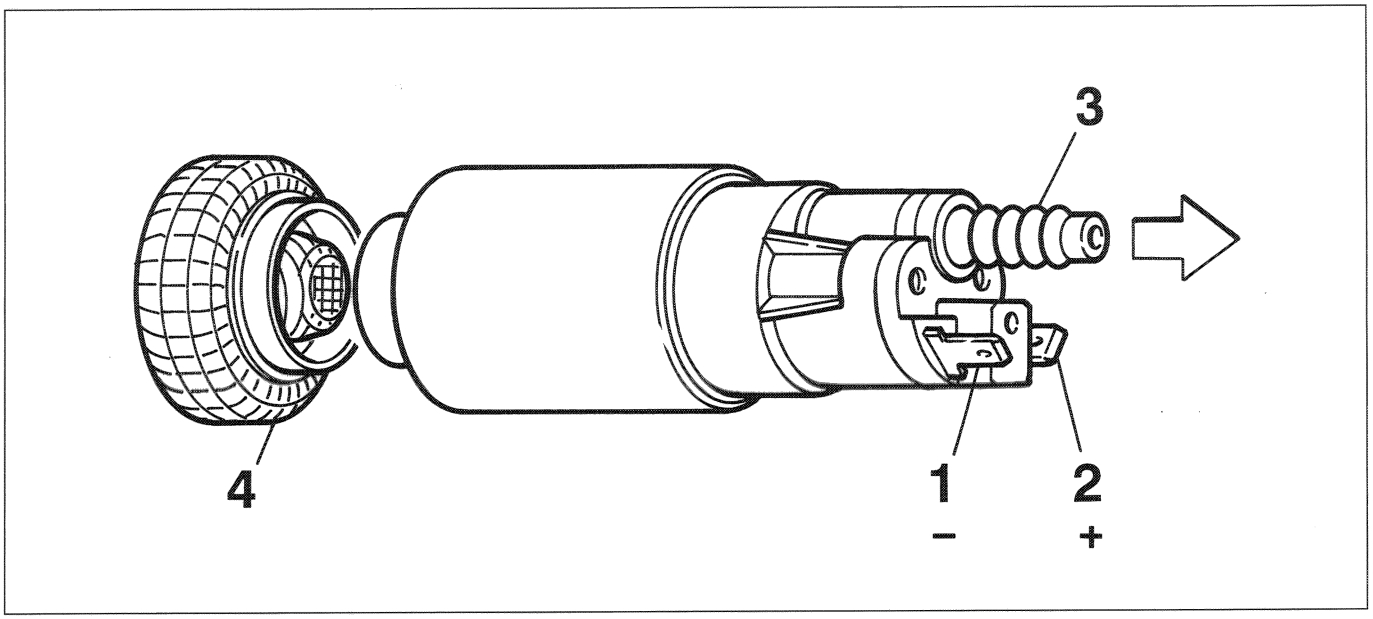
Operation

Fuel is delivered by a volumetric pump able to work with unleaded fuel.
The pump is driven directly by the injection control unit via a dual relay to ensure:
- pump shut-off if engine rpm falls below a minimum threshold;
- timed enablement for a few seconds whenever the key is turned to MARCIA, even if the car does not start;
- enablement of operation while the car is in motion or when the engine is started up.

The pump rotor is moved by a D.C. electric motor supplied at battery voltage. The motor is submerged in the fuel, which cools and cleans the brushes and commutator.

The pump is equipped with a pressure relief valve that short-circuits the input to the output if delivery circuit pressure exceeds 6 bars in order to prevent the electric motor from overheating.
Pump output rating varies according to rotor speed and may therefore change in proportion to supply voltage.
To prevent the pipes emptying when the pump is not working, the outlet line is fitted with a check valve.

MARWAL ESS 276 fuel pump



P3M07MJ01

1. Negative eletrical terminal
2. Positive electrical terminal
3. Fuel delivery
4. Prefilter

Fuel filter

The filter is housed in the case which encloses the fuel pump and filters fuel delivered to the injectors.
The pump intake prefilter is designed to protect the pump.

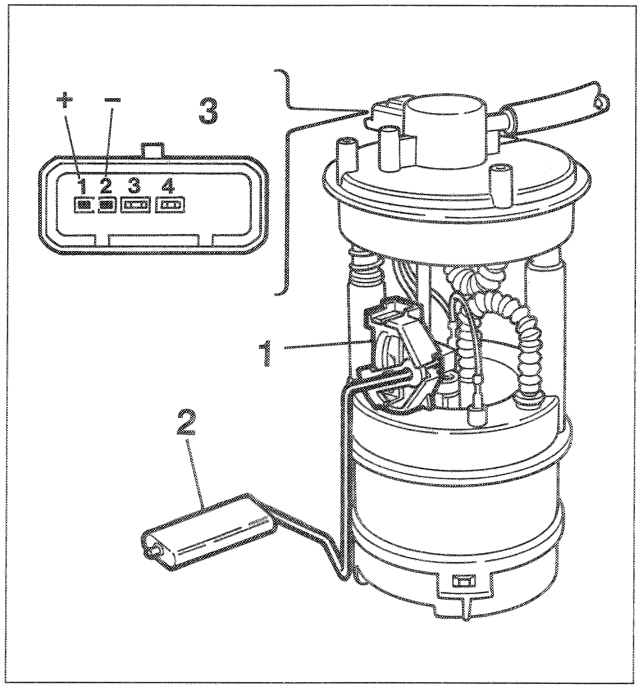
Pressure regulator

The pressure regulator anchored to the top of the pump is a membrane-type differential device adjusted to a threshold of 3.5 - 3.7 bar during production.
The regulator is connected to the fuel outlet via a duct in the pump cover. When the setting pressure is exceeded, the outflow valve opens to allow excess fuel to flow to the tank through the return duct and therefore stabilise pressure inside the pipes.

NOTE *The control unit assumes pressure to be a fixed parameter. The regulator must not therefore be tampered with or the mixture concentration will not be at the required level.*

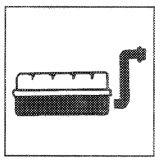
Level gauge with contact strips

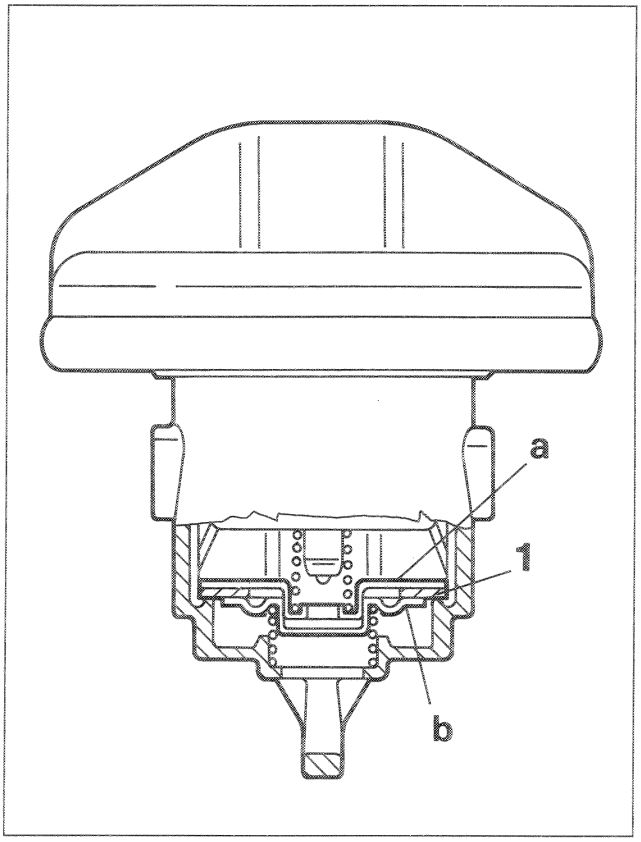
The fuel level gauge is fitted to a special slide on the pump. Gauge operation can be monitored by checking values in the following table.



P3M08MJ01

1. Level gauge
2. Float
3. Gauge contacts

 P3M08MJ03	h = mm	Ohm
4/4	179	3 ± 3
3/4	145	64 ± 5
1/2	110	121 ± 5
1/4	72	193.5 ± 7.5
R	46	245 ± 6
0	12	305 ± 10



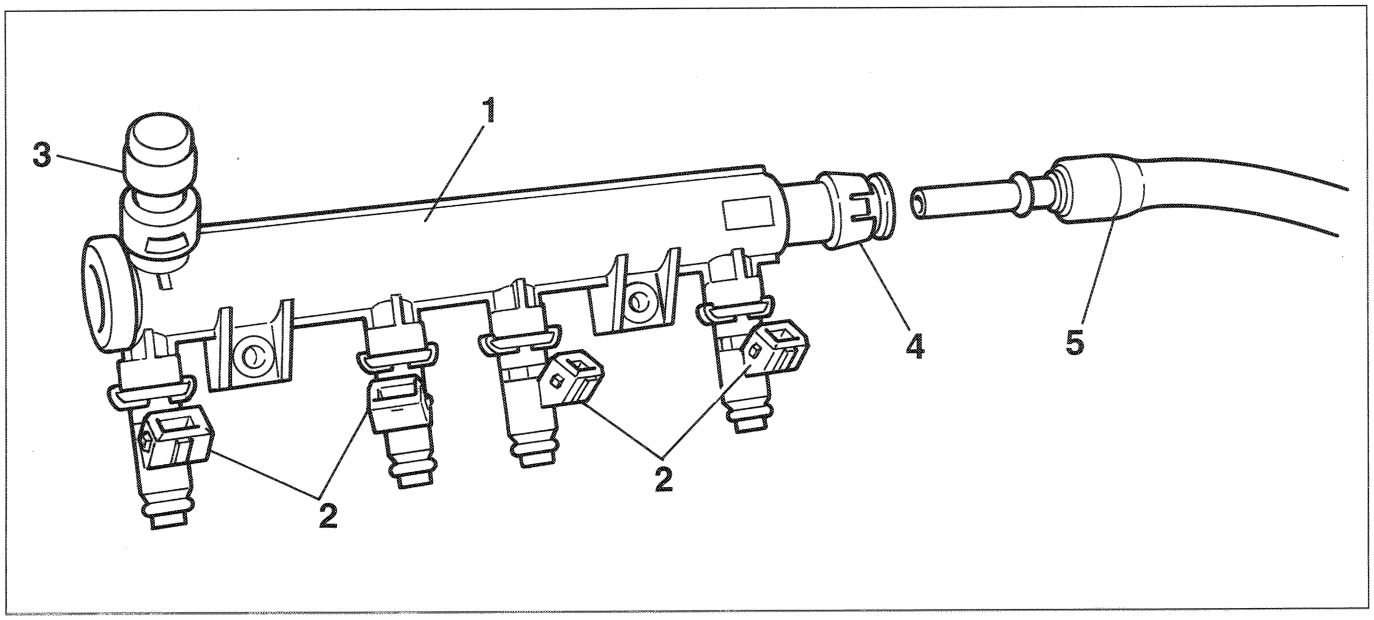
P3M08MJ02

SAFETY AND VENTILATION VALVE

Valve (1) shown in the figure alongside is located in the fuel filler cap and performs the following functions according to pressure in the tank:

- When tank pressure exceeds a set threshold, plate (a) opens to release excess fuel vapours to the outside (safety function).
- If a vacuum is set up inside the tank and exceeds a set threshold, plate (b) opens to take in air (ventilation function).

FUEL MANIFOLD

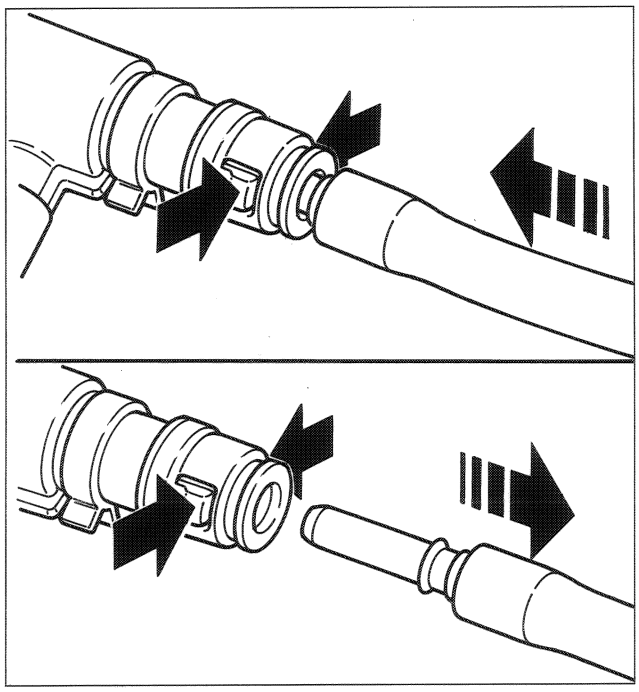


P3M09MJ01

1. Fuel manifold
2. Injector
3. Attachment for releasing fuel pressure
4. Quick-release fitting
5. Fuel delivery line

The fuel manifold is secured to the inside of the inlet manifold. Its function is to direct fuel to the injectors.
The manifold contains the injector sockets and also a quick-release fitting for connection to the fuel delivery line and an attachment for the tests described later.

Removing delivery pipe ending from quick-release fitting on fuel manifold



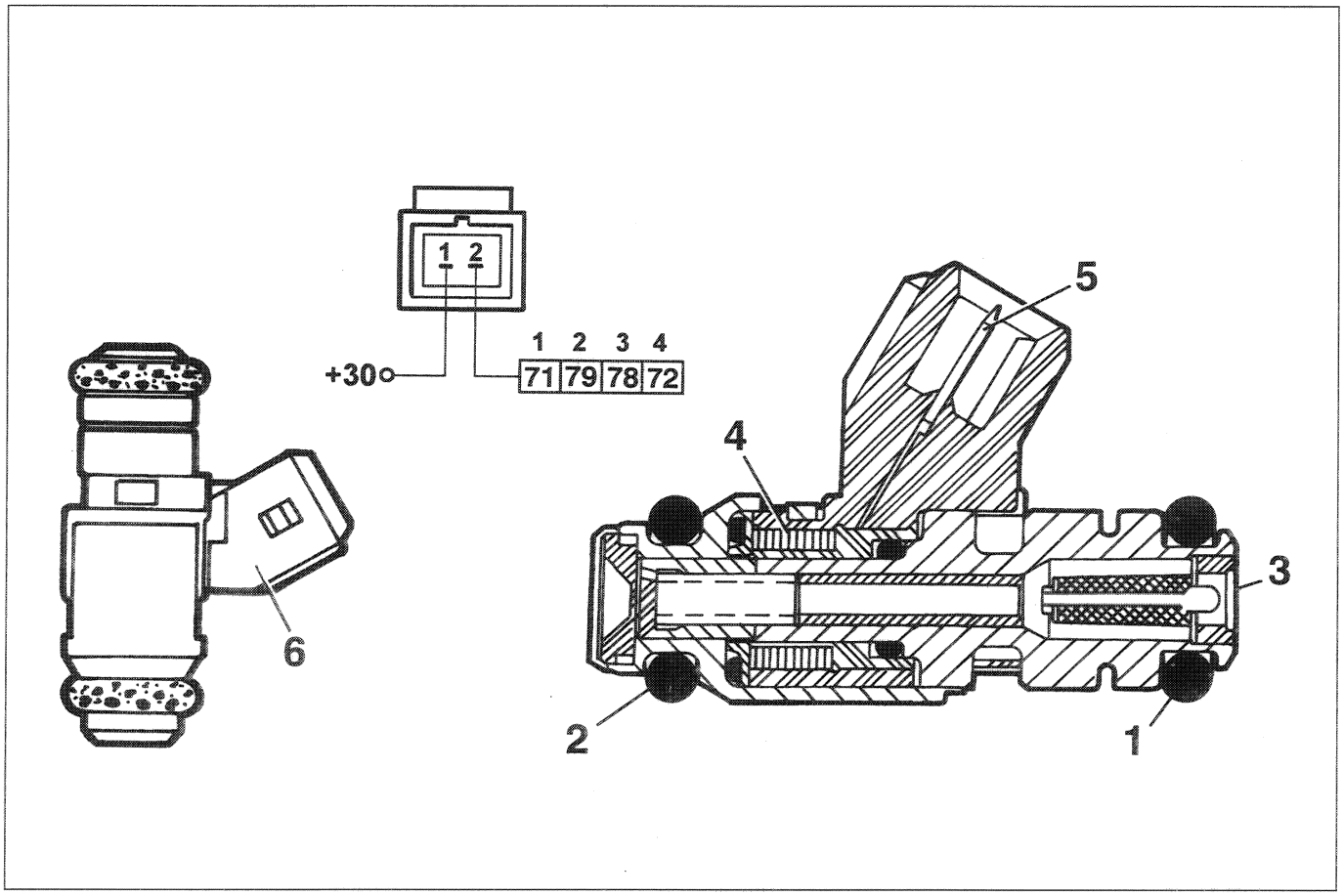
P3M09MJ02

Before disconnecting the end of the fuel manifold, release pressure inside the manifold as described below.

Proceed as follows in order to disconnect the end of the delivery line from the quick-release fitting on the fuel manifold:

- press the retaining clips while simultaneously pushing the end of the delivery line in the direction indicated by the arrow to release the line;
- keep the retaining clips pressed in and pull in the arrowed direction to withdraw the end of the delivery line.

M. MARELLI IWP 023 INJECTOR

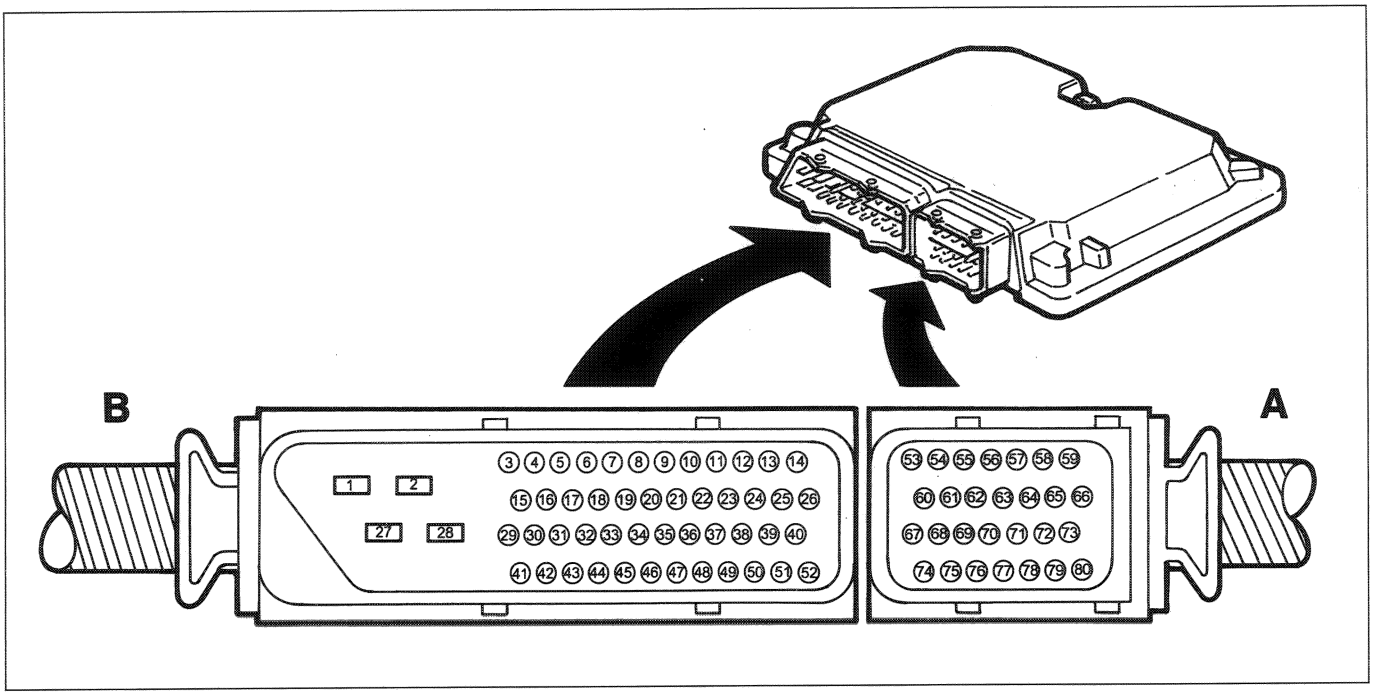


P3M10MJ01

The injectors are miniaturised (Pico) and supplied at 12V. Their interior resistance is 13.8 - 15.2 ohms at 20 °C.
The injectors are secured in place by the fuel manifold, which presses them into their seats in the intake manifold ducts. Two rings (1) and (2) in fluorated rubber ensure a seal in the intake manifold and fuel manifold.
The injectors are fed with fuel from the top (3). The injector case contains winding (4) connected to terminal (5) of electrical connector (6).
The numbers in boxes in the figure indicate the corresponding I.E. control unit pins, which are arranged in order of cylinders.

NOTE *When removing-refitting, do not apply a load greater than 120 Nm to injector connector (6) or operation could be affected.*

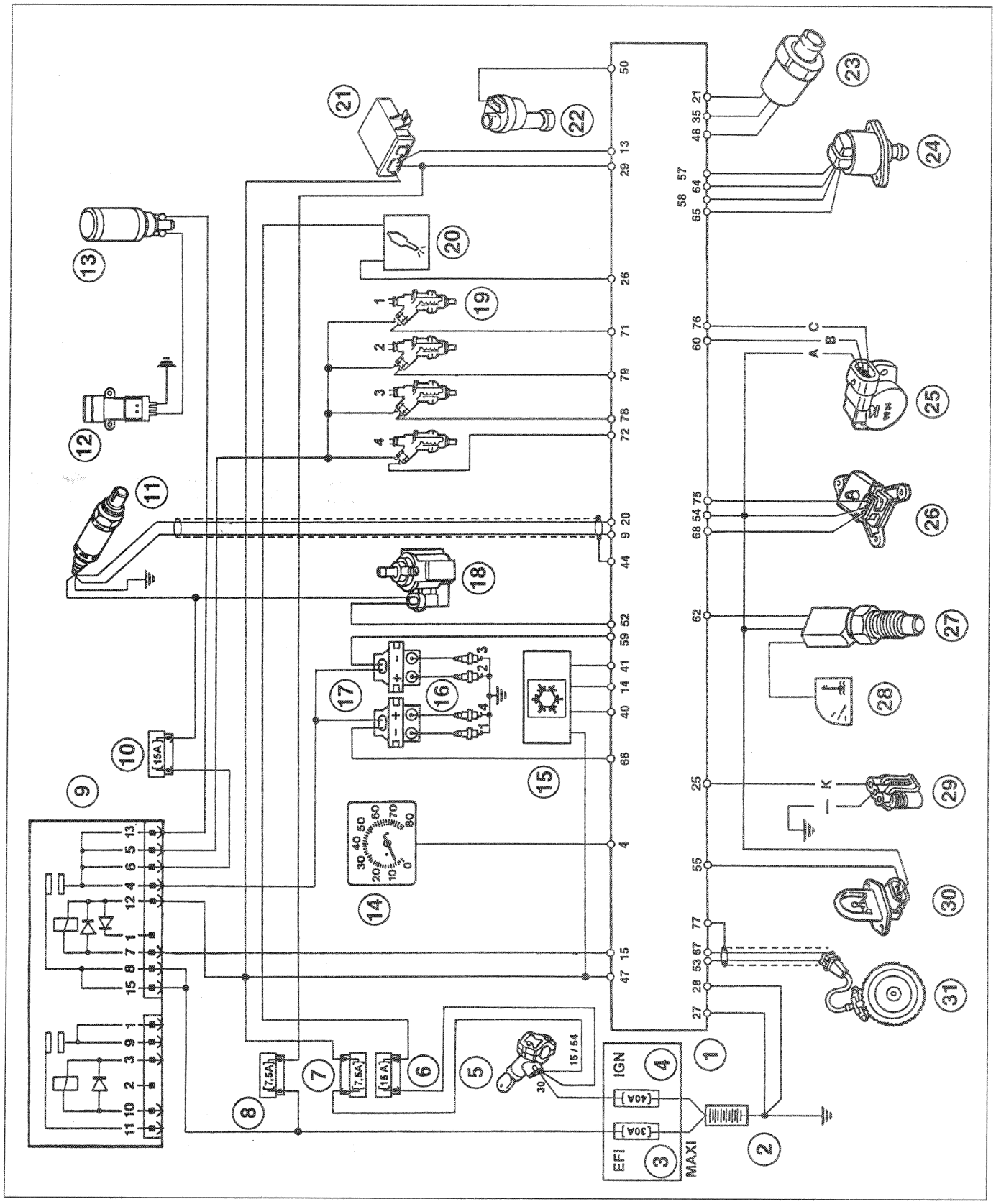
IDENTIFYING CONNECTIONS ON INJECTION CONTROL UNIT (PIN OUT)



P3M11MJ01

1-3 Not connected
4 Rev counter signal
5-8 Not connected
9 Lambda probe (negative)
10-12 Not connected
13 FIAT CODE control unit
14 Radiator fan high speed control (versions with climate control)
15 Injection system relay enablement
16-19 Not connected
20 Lambda probe (positive)
22-24 Not connected
25 Tester socket (K line)
26 Injection system warning light
27-28 Earth
29 Fused power source (+30)
30-34 Not connected
35 Radiator fan low speed activation request signal
36-39 Not connected
40 Radiator fan low speed control (versions with climate control)
41 Air conditioner compressor relay
42-43 Not connected
44 Lambda probe lead shielding
45-46 Not connected
47 Power supply (+15)
48 Air conditione activation request
49 Not connected
50 Vehicle speed signal
51 Not connected
52 Fuel vapour solenoid
53 Rpm sensor (positive)
54 coolant temperature, air pressure / temperature and throttle valve position sensor earth
55 Inlet air temperature
56 Not connected
57 Engine idle speed actuator
58 Engine idle speed actuator
59 Ignition coils (cylinders 1-4)
60 Throttle valve position sensor power source
61 Not connected
62 Coolant temperature sensor (positive)
63 Not connected
64 Engine idle speed actuator
65 Engine idle speed actuator
66 Ignition coils (cylinders 2-3)
67 Rpm sensor (negative)
68 Intake air pressure sensor power supply
69-70 Not connected
71 Injector for cylinder n 1
72 Injector for cylinder n 4
73-74 Not connected
75 Intake air pressure signal
76 Butterfly valve position sensor
77 Rpm sensor lead shielding
78 Injector for cylinder n 3
79 Injector for cylinder n 2
80 Not connected

DIAGRAM SHOWING ELECTRICAL CONNECTIONS BETWEEN CONTROL UNIT / SENSORS - ACTUATORS

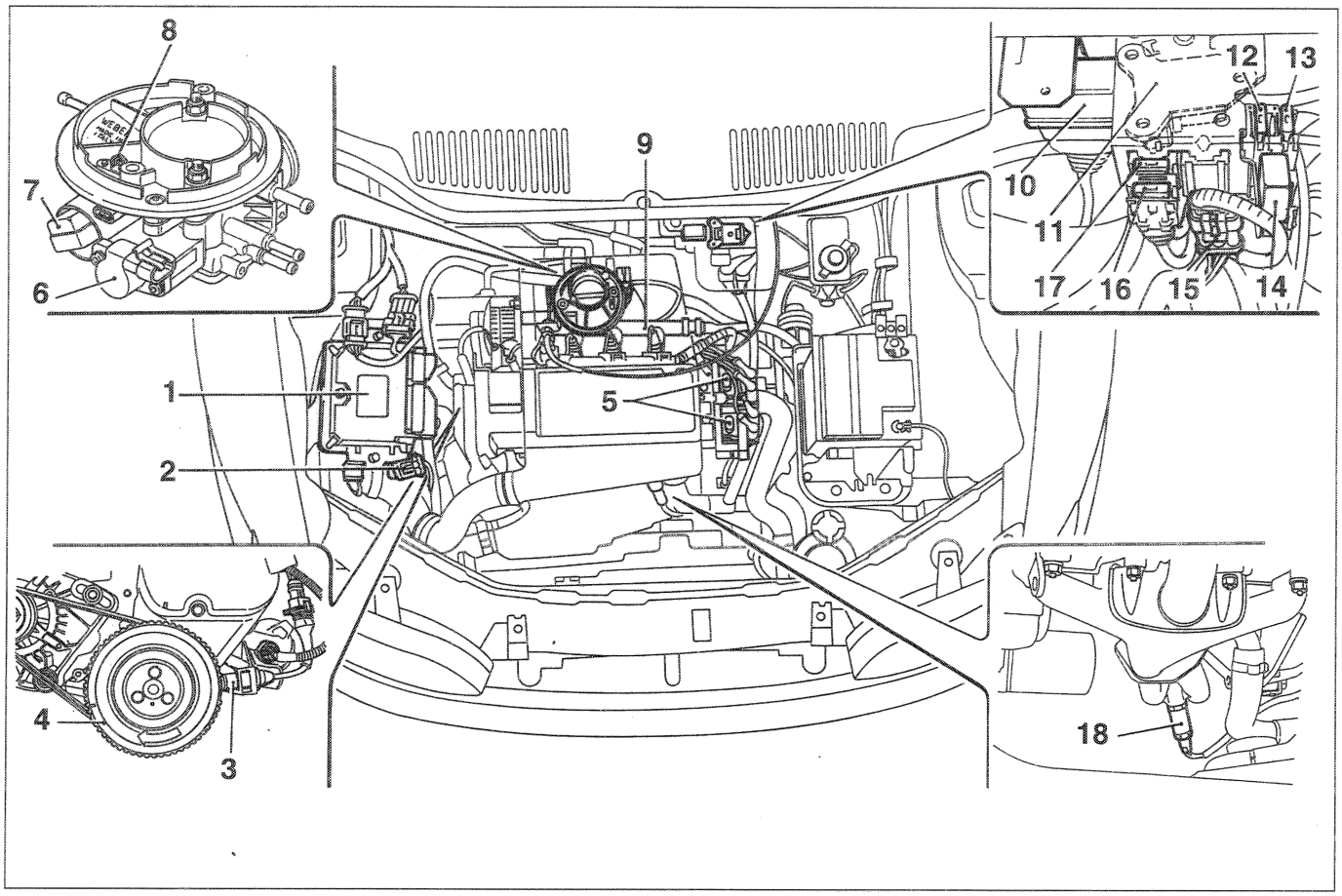


P3M12MJ01

Key to components in diagram showing electrical connections between control unit / sensors - actuators

1. Injection - ignition electronic control unit
2. Battery
3. General 30A fuse protecting injection - igntion system
4. General 40A fsue protecting appliances activated by ignition key
5. Ignition switch
6. 15A fuse protecting injection - ignition system failure warning light
7. 7.5A fuse protecting various components of injection system and injection - ignition control unit power supply (+15)
8. 7.5A fuse protecting FIAT CODE control unit power supply (+30)
9. Dual relay supplying electric fuel pump, lambda probe, fuel vapour cut-off solenoid, ignition coils and injectors
10. 15A fuse protecting lambda probe and fuel vapour cut-off valve
11. Lambda probe
12. Inertia switch
13. Electric fuel pump
14. Rev counter
15. Climate control system control unit and radiator fan low and high speed relays
16. Spark plugs
17. Ignition coils
18. Fuel vapour cut-off solenoid
19. Injectors
20. Injection - ignition system failure warning light
21. FIAT CODE control unit
22. Speedometer sensor (vehicle speed)
23. Pressure switch (may be three-stage or four-stage type)
24. Idle speed actuator (step motor)
25. Throttle valve position sensor
26. Intake air pressure sensor
27. Coolant temperature sensor
28. Coolant temperature gauge
29. Tester socket
30. Inlet air temperature sensor
31. Rpm and TDC sensor

LOCATION OF COMPONENTS OF IAW 49F INJECTION-IGNITION SYSTEM IN ENGINE BAY

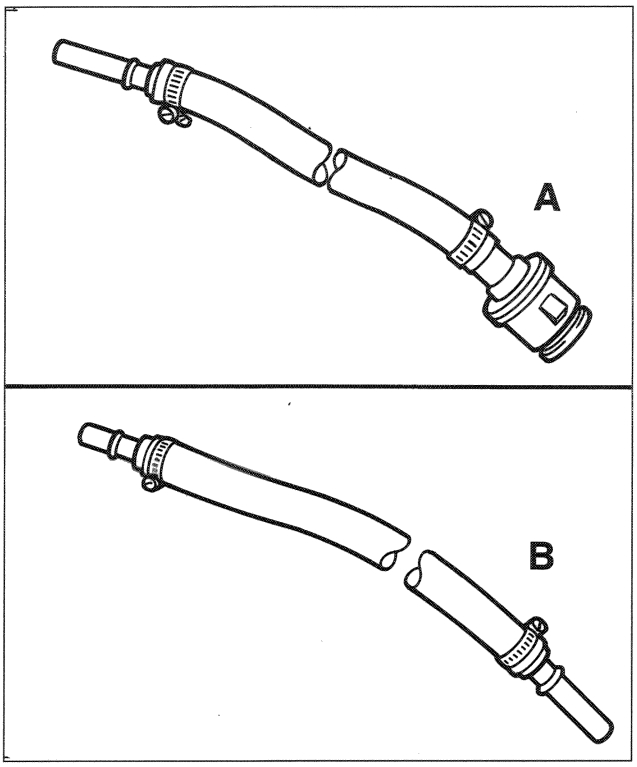


P3M14MJ01

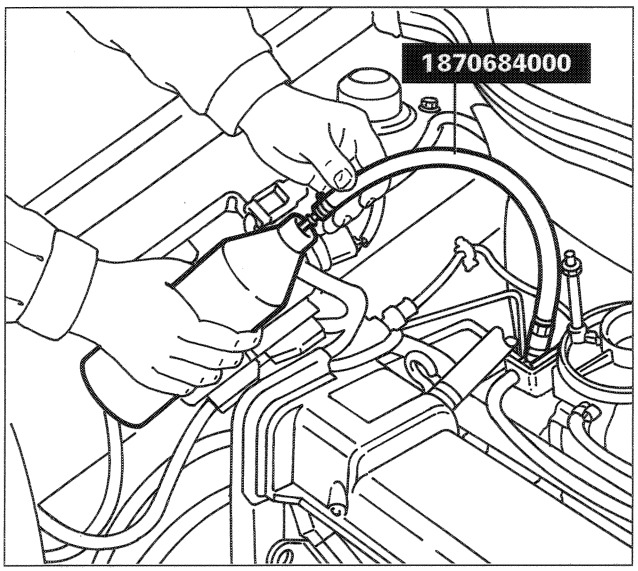
1. Injection-ignition electronic control unit
2. Diagnostic socket
3. Rpm and TDC sensor
4. Engine pulley ring gear (phonic wheel)
5. Ignition coil
6. Throttle valve position sensor
7. Engine idle speed regulation actuator
8. Intake air temperature sensor
9. Returnless fuel manifold
10. Dual relay supplying electronic control unit and electric fuel pump
11. Intake air pressure sensor
12. 15A fuse protecting lambda probe
13. 10A fuse protecting ABS system
14. Relay controlling radiator cooling fan (only for cars with heater)
15. Pulse generator coupling
16. 7.5A fuse protecting Fiat CODE system
17. 7.5A fuse protecting injection system
18. Lambda probe

CHECKING FUEL SUPPLY CIRCUIT

CARRY OUT THESE OPERATIONS IN THE PRESENCE OF A SUITABLE VAPOUR ASPIRATION AND FILTRATION SYSTEM.



P3M15MJ01



P3M15MJ02

Checking fuel supply circuit pressure

Check supply pressure and fuel system watertightness as described below. Use device 1860955000 fitted with two adaptors produced as follows:
- adaptor (A) use a new-type quick-release female terminal and pipe section supplied in kit n. 1860955003 and an old-type quick-release male fitting supplied in Kit n. 1860955001;
- adaptor (B) use a new-type quick-release male fitting and pipe section supplied in Kit n. 1860955003 and an old-type quick--release fitting supplied in Kit n. 1860955001;

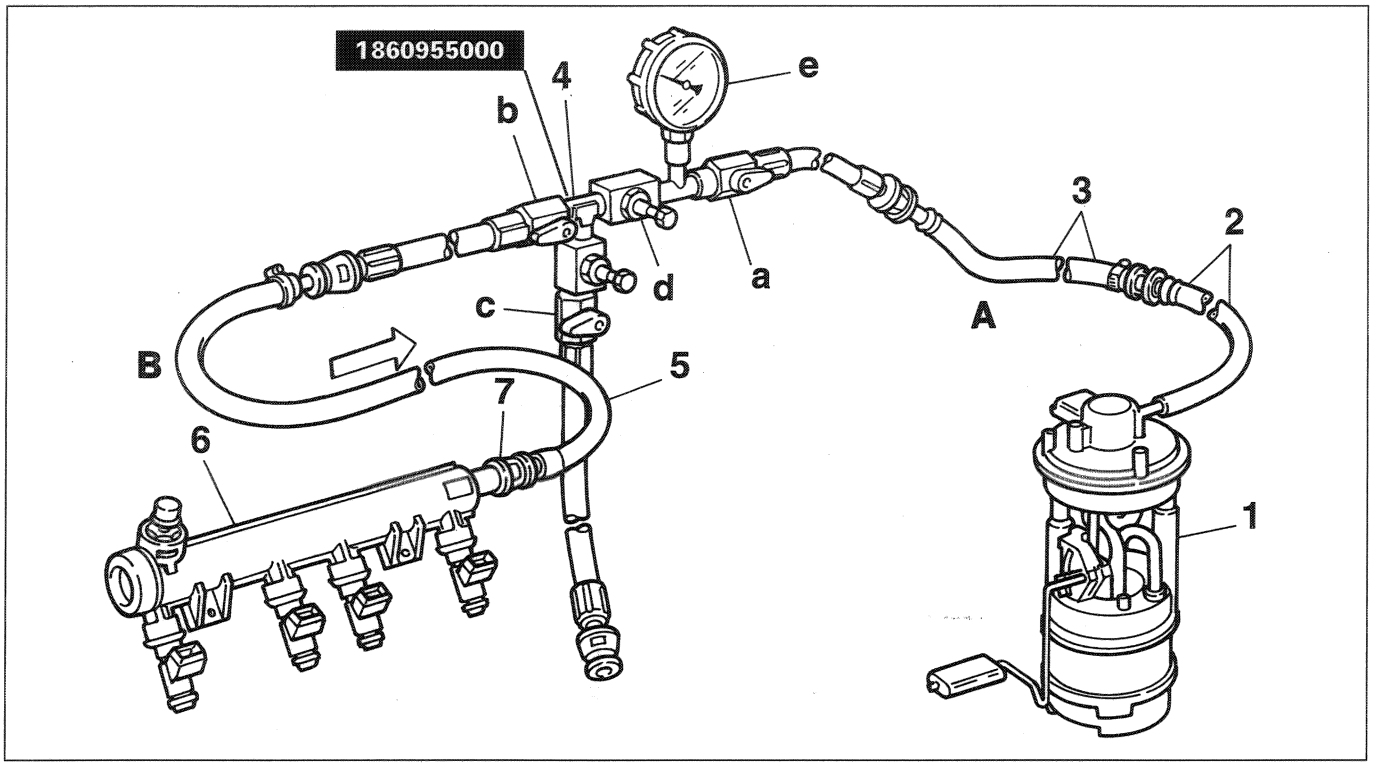
Arrange the adaptors as shown in the figure.

Releasing fuel pressure in the fuel feed circuit

The fuel feed circuit is maintained at a constant pressur e of 3.2 bar even when the engine is off. Before working on the delivery lines, it is therefore necessary to release pressure in the system using adaptor n. 1870684000 and a container to collect the excess fuel.
Proceed as follows:
- Remove the protective cover from the attachment on the fuel manifold;
- introduce the male terminal of the adaptor inside the container and insert the quick--release fitting on the attachment on the fuel manifold, as shown in figure. The small quantity of excess fuel responsible for creating the pressure will then be drained into the container and the fuel supply system can be tested;
- disconnect the adaptor from the attachment and refit the protective cover.

Checking fuel supply circuit pressure

Set up tester 1860955000 using the adaptors prepared previously and fitted as shown in the figure below. Arrange ball valves (a), (b) and (d) so that they are fully open and valve (c) so that it is closed.



P3M16MJ01

1. Electric pump assembly
2. Fuel delivery line
3. Adaptor (A)
4. Tester N. 1860955000
5. Adaptor (B)
6. Fuel manifold
7. Quick-release fitting on manifold

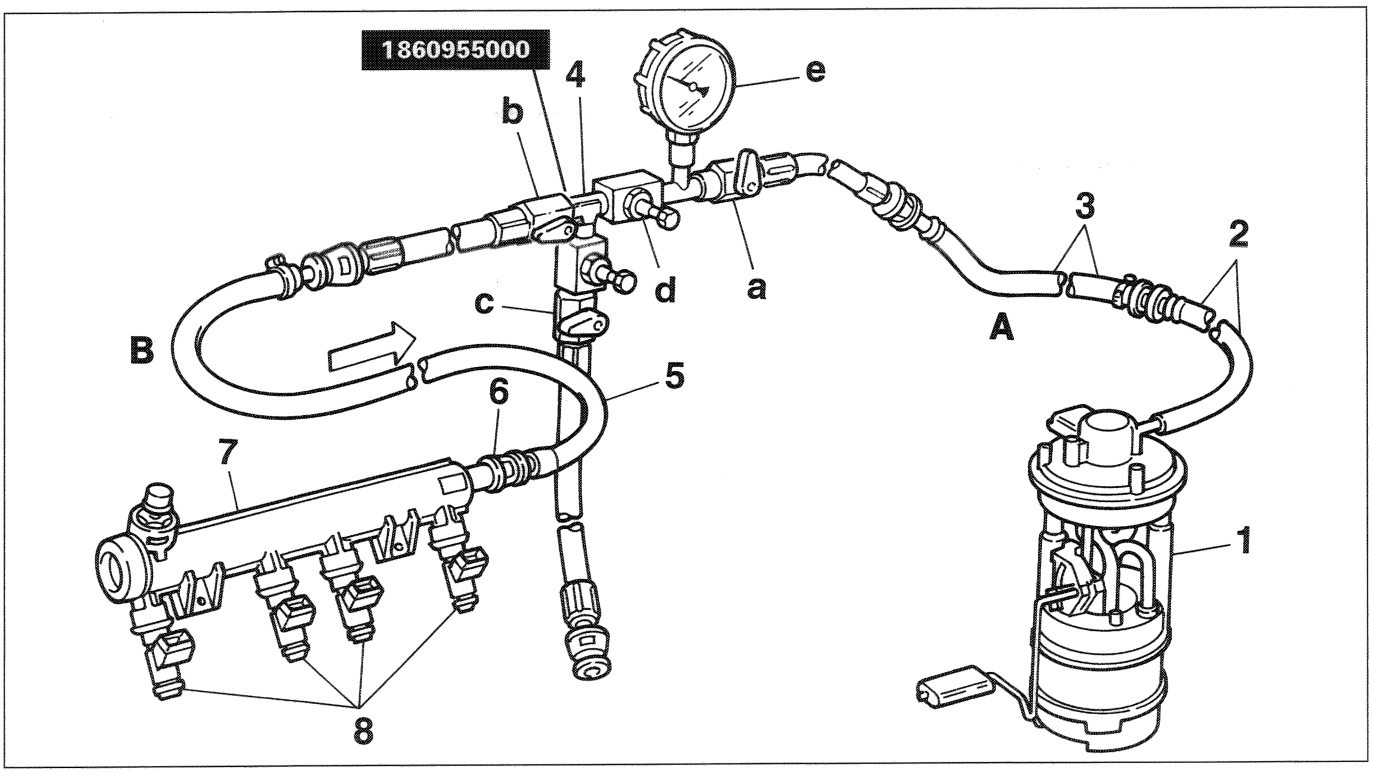
After releasing pressure, disconnect the end of fuel delivery line (2) from quick-release fitting (7) on the manifold as described on the previous page. Connect to the female fitting of adaptor (A), connect the new-type male terminal of adaptor (B) to the quick-release fitting on fuel manifold (7) and check fittings are secure.
Turn the ignition key to MAR and watch pressure gauge (e). Pressure should rise to about 3.5 bar and then settle at about 3.2 bar (the pressure drops because the pump is deactivated after a few seconds because start-up has not taken place).
If pressure drops below the specified level, check the watertightness of the system upstream of the fuel manifold and check the tightness of the injectors as described below.

Checking watertightness of fuel delivery line

Keep the tester set up as described in the previous paragraph, close valve (b), keep valve (c) closed and valve (a) fully open.
Turn the ignition key to MAR and read the pressure off pressure gauge (e). The reading should rise to about 3.5 bars and then settle at about 3.2 bars (the pressure drops becuase the pump is deactivated after a few second because start-up has not taken place).

If pressure drops below the specified level, check the watertightness of the system upstream of the manifold. If the fuel delivery line is found to be leak-free and undamaged, replace the fuel pump assembly because - as described in the paragraph on the fuel pump - the pressure regulator is housed in the assembly and CANNOT be replaced.
If the pressure still exceeds the specified level when the test is repeated and remains stable at this high level, replace the electric fuel pump because the pressure regulator housed in the pump is not operating efficiently.
To replace the fuel pump assembly, see the appropriate procedure.
If the pressure is as specified, check the tightness of the fuel manifold and injectors as described in the next paragraph.

Checking injector tightness



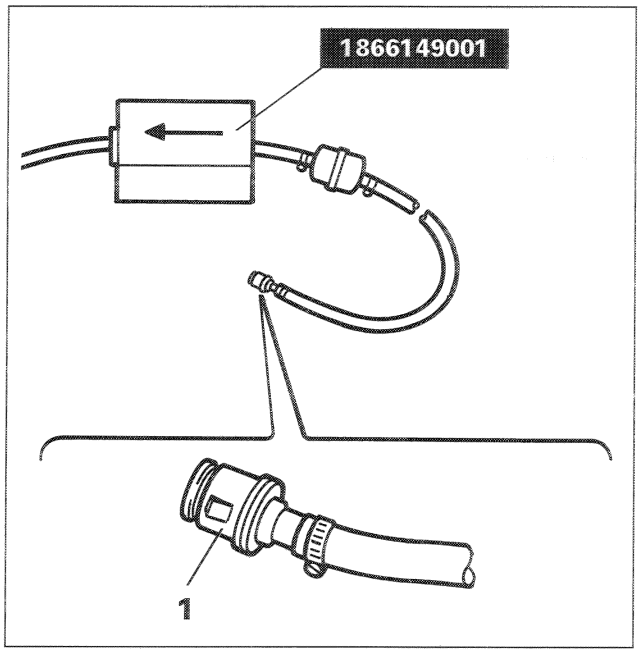
P3M17MJ01

1. Fuel pump assembly
2. Fuel delivery line
3. Adaptor (A)
4. Tester N. 1860955000
5. Adaptor (B)
6. Quick-release fitting on manifold
7. Fuel manifold
8. Injectors

Keep the tester set up as described in the previous paragraph, move valve (b) to fully open, keep valve (c) closed and valve (a) fully open.
Turn the ignition key to MAR and read the pressure off the gauge (e). After rising to about 3.5 bar, it should settle at about 3.2 bar, then close valve (a) and check that the pressure stays constant for at least one minute. Otherwise one or more injectors are leaking.
To remove the fuel manifold and injectors, see the appropriate procedure.

Removing tester

Remove tester 1860955000 with the key turned to STOP. Proceed as follows:
- insert the end of the pipe connected to valve (c) in a suitable container;
- open valve (c) and drain excess fuel into the container;
- keep the pipe in the container and disconnect the end of the delivery pipe from the female fitting of adaptor (A). Keep the connection turned upward;
- allow the fuel in the pipe to flow into the container;
- disconnect the terminal of adaptor (B) from the fitting on the fuel manifold and allow residual fuel in the pipe to flow into the container;
- reconnect the fuel delivery line to the fuel manifold.

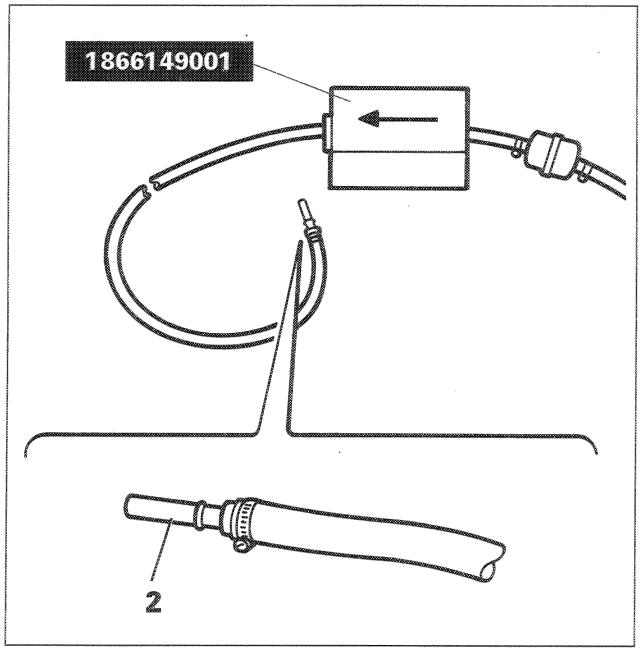


P3M18MJ01

Checking fuel consumption using Flowtronic device

Adapt the FLOWTRONIC N1866149001 fuel consumption measuring device as described below:

- cut the terminal on the inlet pipe if it is not quick-release type (1) and replace with a female quick-release fitting supplied in Kit N. 1860955003, as shown in the figure.

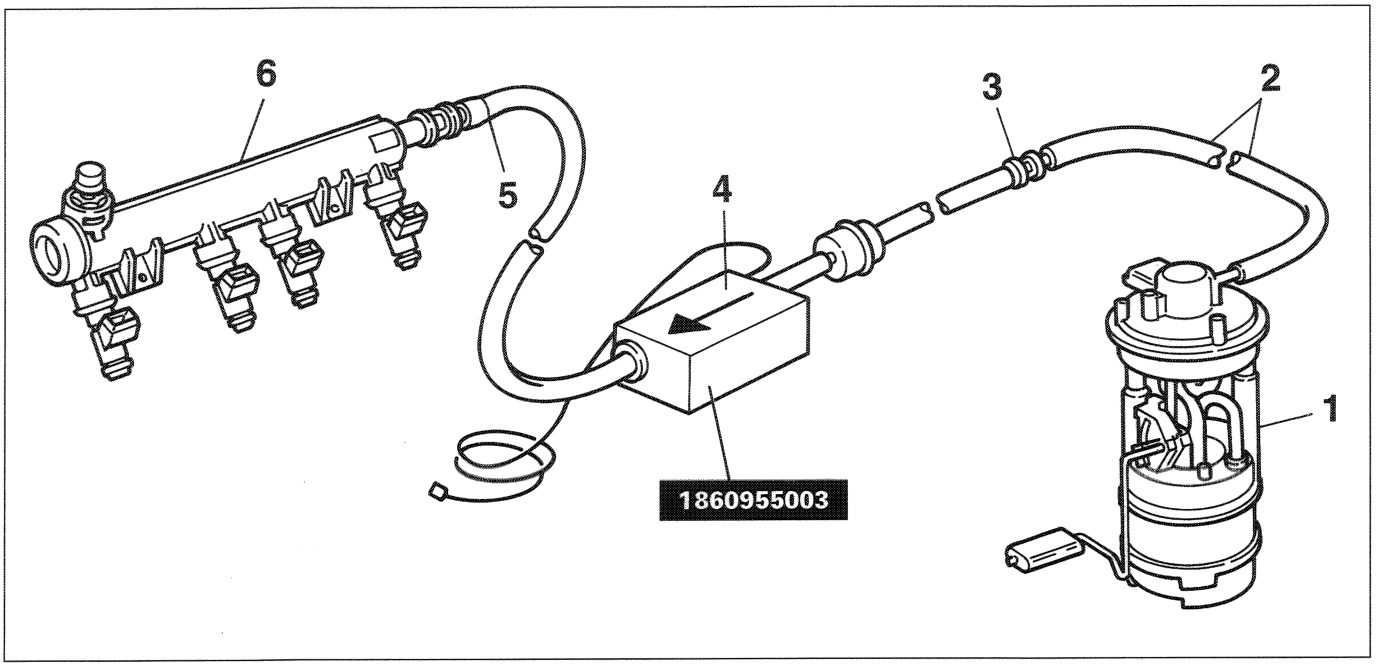


P3M18MJ02

- cut the terminal on the outlet pipe, if not quick-release type (2) and replace with a male fitting supplied in Kit N. 1860955003, as shown in the figure.

Recover the old terminals and keep so that they can be adapted for use on other systems.

- fit the end of the the delivery line to the quick-release female fitting of the FLOWTRONIC device and the male fitting to the quick-release fitting on the fuel manifold;
- position the device in the engine bay, move the connection lead inside the car and connect the device as described in the instructions supplied with the device.
- check fuel consumption in accordance with EC 93/116 regulations and check that levels correspond to specifications shown in section 00 - Technical Data.



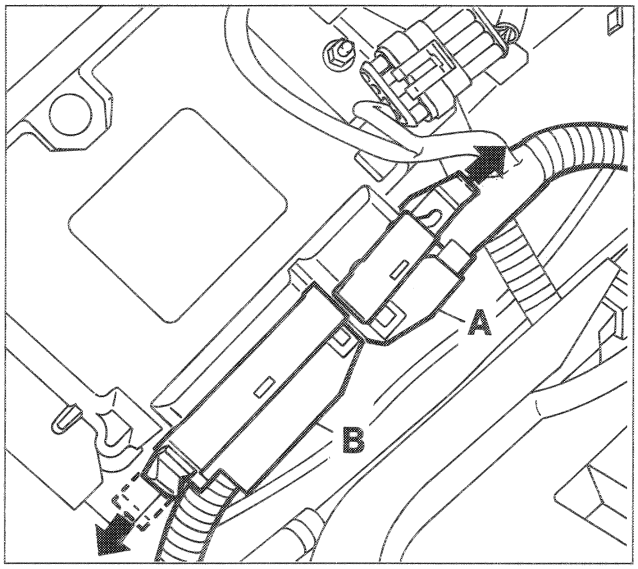
P3M19MJ01

1. Fuel pump assembly
2. Fuel delivery line
3. Quick-release female fitting
4. FLOWTRONIC device
5. Male terminal
6. Fuel manifold

- carry out the fuel consumption road test in accordance with EC directive 93/116 CE (litres per 100 km):
  URBAN CYCLE - includes one cold start followed by a simulated varied urban cycle;
  OUT-OF TOWN CYCLE - includes frequent accelerations, in all gears, to simulate normal out-of--town vehicle use; speed ranges between 0 and 120 km/h;
  AVERAGE COMBINED FUEL CONSUMPTION - 33% of urban cycle and 67% of out-of-town cycle;
- check that the results correspond to specifications shown in "Introduction and technical data" section.

NOTE *Type, traffic situations, driving style, weather conditions, version/accessories, presence or absence of a roof rack, presence of special equipment and vehicle condition in general, may lead to fuel consumption figures other than those measured as described above.*

Once the fuel consumption test has been carried out, release fuel pressure as described previously before removing the device and then proceed as follows:
- disconnect male terminal (5) from the fuel manifold and hold up to avoid fuel leaks;
- disconnect female fitting (3) from the delivery line and hold up to prevent fuel leaks;
- join the two male (5) and female (3) terminals of the FLOWTRONIC device to prevent fuel emerging from the pipes and refit the device;
- reconnect the end of the delivery line to the fuel manifold. Check for leaks.

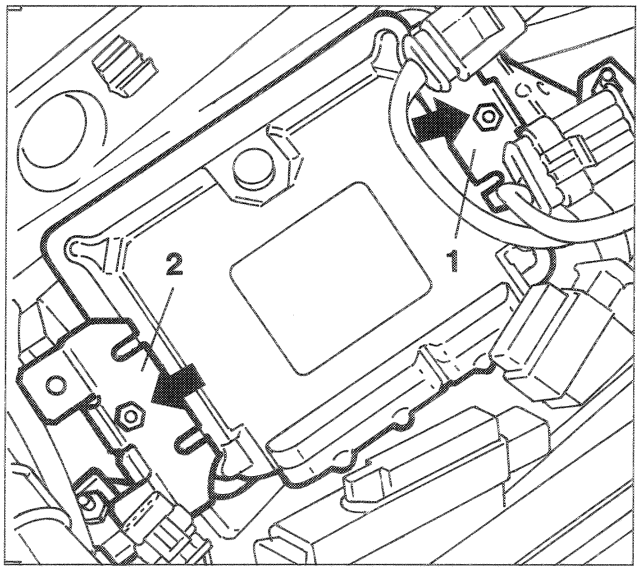


P3M20MJ01

REMOVING-REFITTING INJECTION-IGNITION ECU

It is absolutely prohibited to swap control units between different cars to check their efficiency.
During testing, before replacing a control unit, check that the component is really inefficient because when a new control unit is activated, the Fiat CODE system secret code is stored and this makes the control unit completely unusable on other cars.

Unconnected pins may be live and should not be connected due to the risk of short-circuits which could damage the control unit.
Fit and remove multiple connectors with the key out.



P3M20MJ02

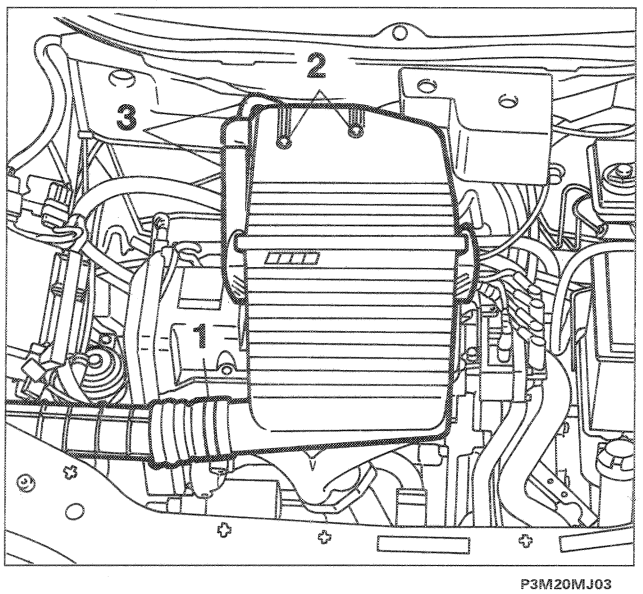
Removing

Take out the ignition key and disconnect the battery leads;

1. Disconnect connectors A and B by moving cursors in the arrowed direction.
2. Unscrew the retaining bolts indicated and take off brackets (1) and (2), then remove the injection-ignition contoro unit from the car.

Refitting

Carry out removal instructions in reverse order. Take care not to force the connectors onto the control unit.



P3M20MJ03

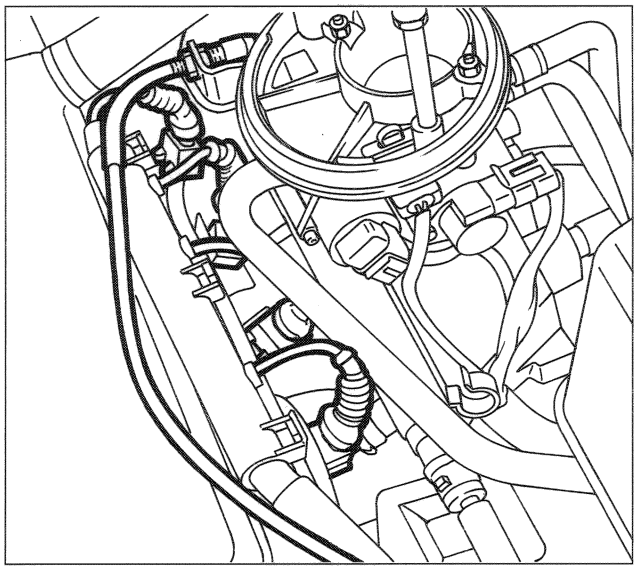
REMOVING-REFITTING FUEL MANIFOLD AND INJECTORS

Release fuel pressure as described on page 15.

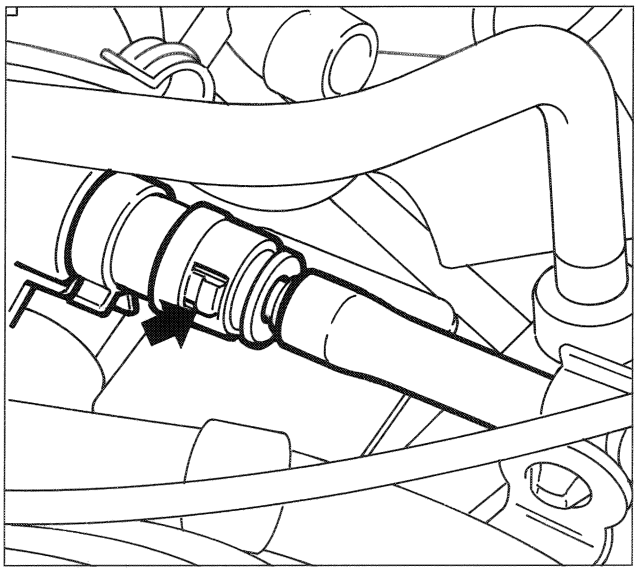
Removing

Disconnect battery leads.

1. Loosen collar (1) and remove the air intake sleeve. Unscrew retaining bolts (2) disconnect pipe (3) and remove the air cleaner assembly from the car.



P3M21MJ01

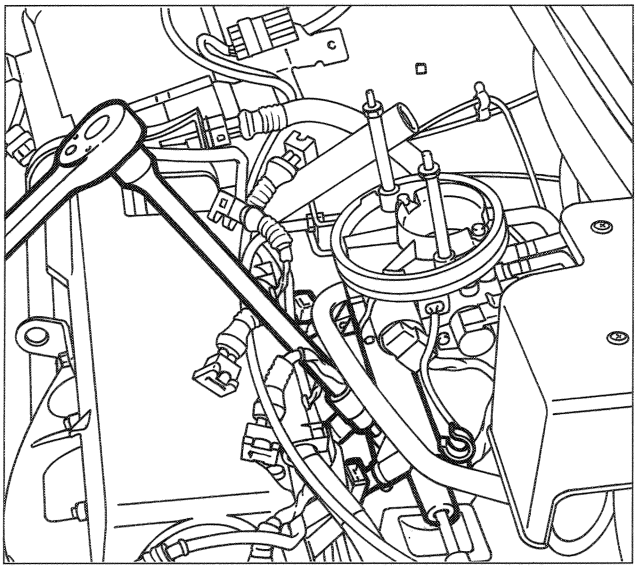


P3M21MJ02

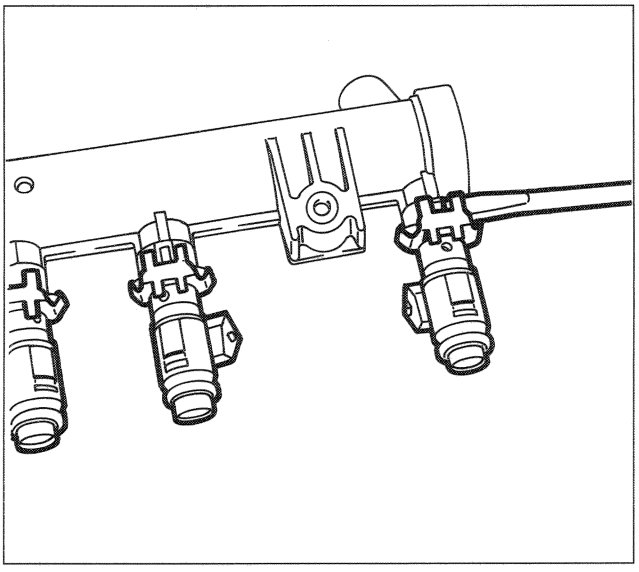
1. Loosen the lock nut, unscrew the nut and withdraw the accelerator cable linkage from its mount. Disconnect connectors from injectors.
2. Disconect the delivery pipe from the quick-release fitting on the fuel manifold, as described in the relevant paragraph on page 9.
3. Unscrew the retaining bolts, remove the fuel manifold with injectors from the car.
4. Withdraw the retaining clips and take the injectors out of the manifold.

Refitting

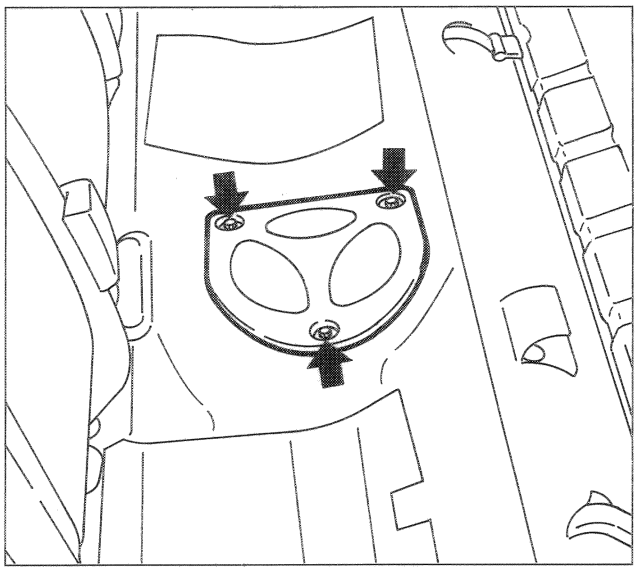
Carry out removal operations in reverse order. Ensure the injectors are correctly positioned in their seats.
Re-position the accelerator cable linkage and adjust the position to ensure idle speed is as specified.



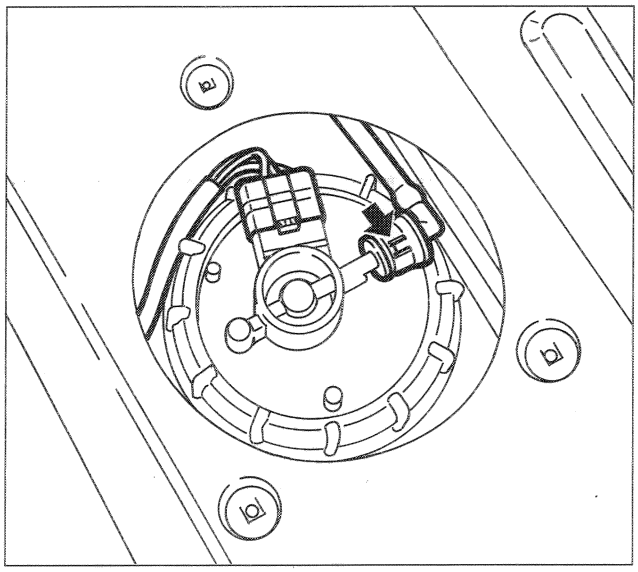
P3M21MJ03



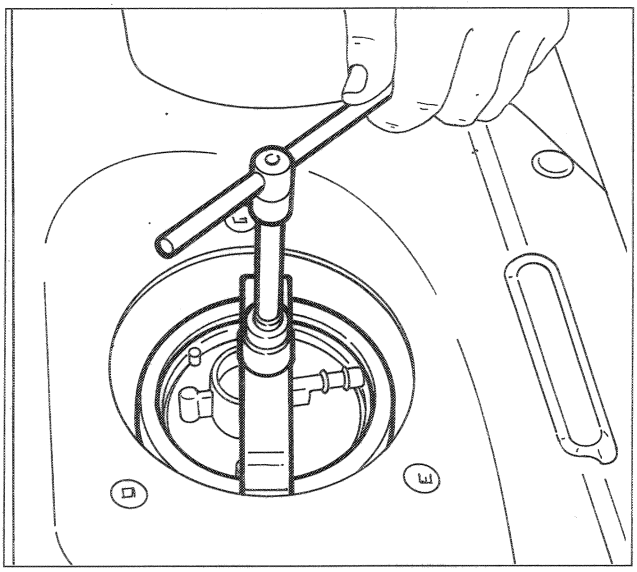
P3M21MJ04



P3M22MJ01



P3M22MJ02



P3M22MJ03

REMOVING-REFITTING ELECTRIC PUMP/ FUEL LEVEL GAUGE ASSEMBLY

Carry out this procedure in the presence of a suitable vapour aspiration and filtration system.

Release fuel pressure in the pipe as described in previous pages. Empty the fuel tank if it is full.

Removing

Disconnect the battery leads, lift the rear seat to gain access to the cover over the fuel pump assembly.

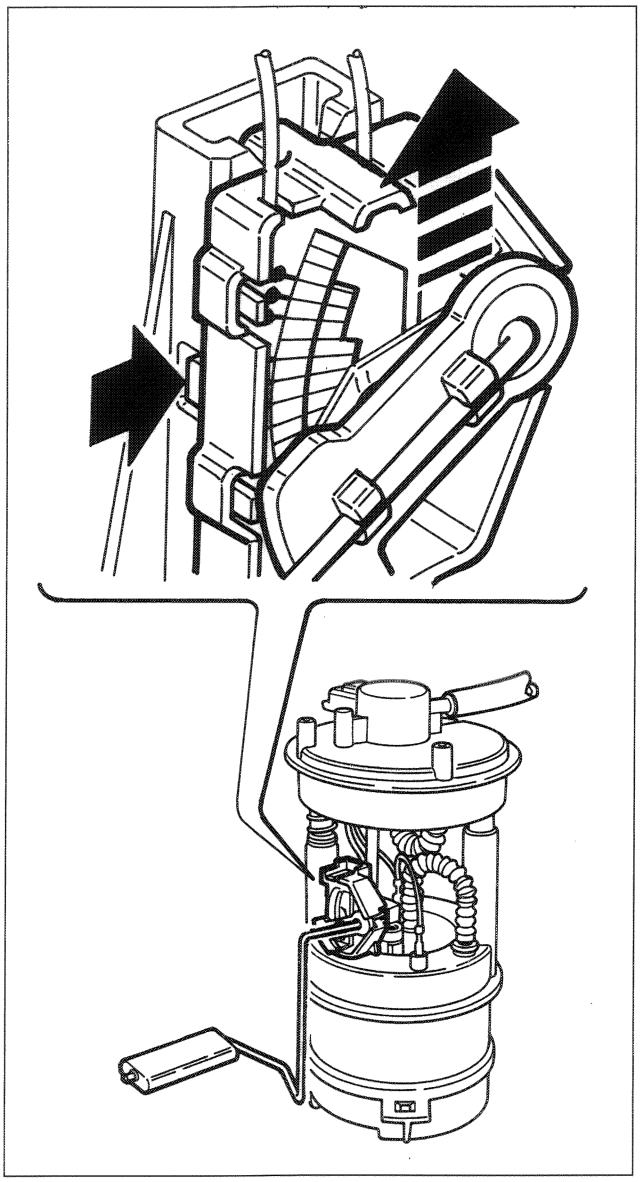
1. Unscrew the bolts indicated and remove the cover from the vehicle.

2. Disconnect the delivery line by pressing the quick-release fitting retaining tabs indicated and plug the fuel outlet terminal. Disconnect the electrical connection.

3. Unscrew the ring gear retaining the fuel pump using tool 1854033000.
Remove the pump from the car, taking care not to damage the gasket.

Refitting

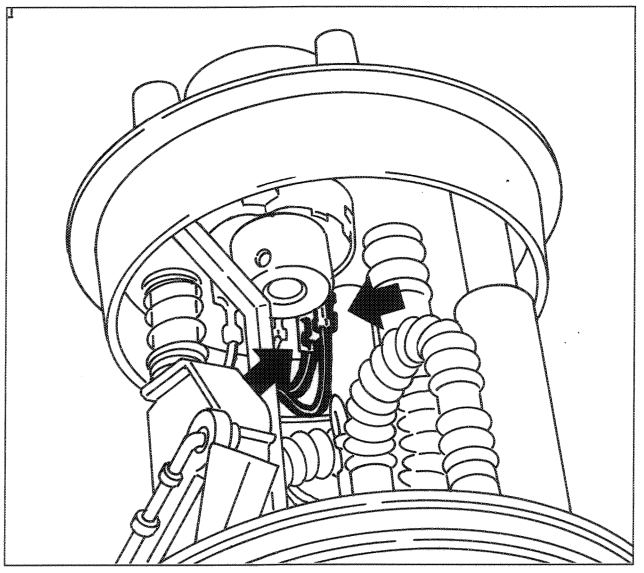
Carry out removal instructions in reverse order. Check for fuel leaks.



P3M23MJ01

Removing-refitting fuel level gauge

- Undo the retaining clip shown and withdraw the fuel level gauge by sliding in the arrowed direction.



P3M23MJ02

- Disconnect the fuel level gauge electrical connections.

Refitting

Carry out removal instructions in reverse order and ensure the connections are correctly positioned.