# Pressure tester for fuel injection systems

## General:

**All car manufacturers install fuel injection systems of one type or another in their cars. These instructions are intended as a general guide to the use of the fuel pressure tester. The descriptions of the procedures represent examples only.**
**In every case, the recommendations and instructions of the respective vehicle manufacturer must be followed. Test data should be taken from the Autodata fuel tables or injection system manuals.**

## Safety

- ➡ Car exhaust gases and fuel vapours are harmful to the health. When working in enclosed spaces, switch on the air extraction system without fail.
- ➡ Fuel and fuel vapours are highly inflammable. Do not smoke and avoid naked flames and sparks.
- ➡ To prevent irreparable damage, switch off the ignition before disconnecting or connecting the electrical leads relating to the ignition and injection systems.
- ➡ Fuel injection systems are pressurised. Release connections and hoses slowly and with care, with the engine stopped and the ignition switched off. Take measures to catch escaping fuel. If necessary, wear protective goggles.
- ➡ On completion of the work on the fuel system, carry out a leak check without fail.

## Cleanliness

Contamination, particularly in injection systems, leads to malfunctions. To avoid these, observe the following recommendations:

- ▸ Before starting work, thoroughly clean connections and surroundings.
- ▸ Place removed parts on a clean surface and cover.
- ▸ During workbreaks, cover or reclose any openings resulting from the removal of component parts.
- ▸ Do not work with compressed air after gaining access to the interior of the fuel system.

## Other instructions

If faults occur in the fuel supply system, carry out the following tasks before undertaking pressure testing:

- ▸ Check the battery voltage and fuse.
- ▸ Check to ensure that the fuel pump starts when the ignition is switched on.
- ▸ Check that the fuel lines have been properly laid.

**Tester specification (LR 180/2)**
1 DS 100 Pressure gauge with protective rubber cap and hook 0-10 bar (150 psi)
3 Hoses with connectors
1 Three-way valve
12 Adapters with connectors (30 adapters in the case of the LR 180/4).

The tester can be used with most versions of the following systems:

| Manufacturer | Type of sytem | Manufacturer | Type of sytem | Manufacturer | Type of sytem |
|---|---|---|---|---|---|
| **Bosch** | K, KE, L, LH Mono-Jetronic, Motronic | **Lucas** | CU 15, CUX EFI | **Siemens** | MS40, Simtec, Simos |
| **Fenix** | 1B, 3B, CFI, EEC, EFI, SEFI | **Mitsubishi** | ECI-Multi | **Subaru** | SPFI, MPFI |
| **GM** | Multec S/M | **Nippon Denso** | EGI-EGI-S | **Suzuki** | EBE |
| **Hella** | MPFI | **Nissan** | ECCS | **Toyota** | TCCS |
| **Hitachi** | MPI | **Renix/Bendix** | SPI, R | **VW** | Digijet, Digifant |
| **Honda** | FI | **Rover** | M.E.M.S.SPI, PGM-FI | **Weber/Marelli** | SPI, SEFI, MIW |

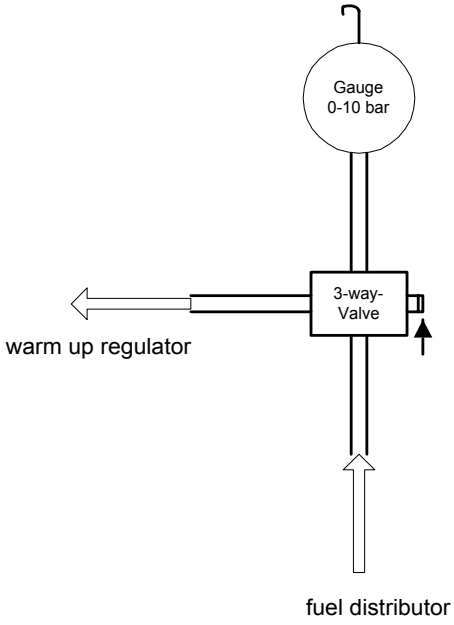
**These systems are used in the following makes of vehicle:**
**Alfa Romeo, Audi, BMW, Citroen, Fiat, Ford, Honda, Hyundai, Jaguar, Lecia, Mazda, Merceds-Benz, Mitsubishi, Nissan, Opel, Peugeot, Porsche, Renault, Rover, Saab, Seat, Skoda, Subaru, Suzuki, Toyota, Vauxhall, Volvo, VW.**

## TEST PROCEDURES

### 1. Testing vehicles with 'K-Jetronic' systems

### 1.1 System pressure

- Depressurise the system.
- Close the 3-way valve between the fuel distributor and warm-up regulator.
- Select an adapter of the correct shape and size.
- Remove the pump relay and connect cable terminals 30 and 87 with an auxiliary cable with integral 20 A fuse.
- Switch on the ignition; the fuel pump must now run.
- Read off the system pressure on the pressure gauge. For the specified pressure, see manufacturer's data.




### 1.2 Control pressure

- The engine must be running and the control valve on the 3-way valve be open.
- Read the control pressure on the pressure gauge.
- For COLD/HOT pressures, see manufacturer's data.

### 1.3 Freedom from leaks/holding pressure

Close the control valve on the 3-way valve, bridge the fuel pump and switch off the pump after 3-5 seconds.
Read off the holding pressure after 10 and 20 minutes; for pressures, see manufacturer's data.

## 2. Testing vehicles with 'KE-Jetronic' systems

### 2.1 System pressure/upper chamber pressure

- Connect the three-way valve to the fuel distributor between the upper and lower chambers.
- Select an adapter of the right shape and size.
- Open the control valve on the 3-way valve.
- Remove the pump relay and connect cable terminals 30 and 87 with an auxiliary cable with integral 20 A fuse.
- Switch on the ignition; the fuel pump must now run.
- Read off the system pressure on the pressure gauge. For the specified pressure, see manufacturer's data.

### 2.2 Differential pressure/lower chamber pressure

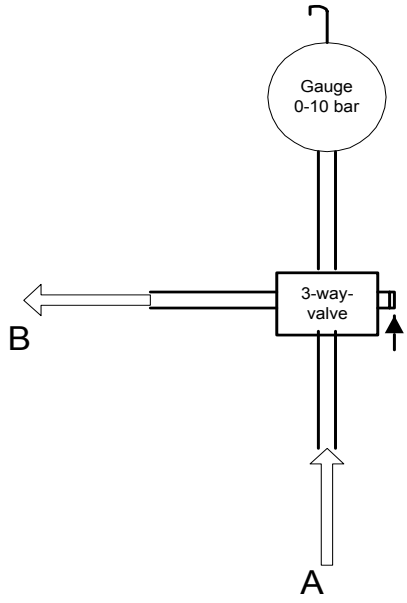
- Close the control valve on the 3-way valve and remove the multiple plug from the pressure actuator on the fuel distributor.
- Switch on the ignition and bridge the fuel pump (relay removed).
- Read off the differential pressure on the pressure gauge; for the specified pressure, see manufacturer's data.

### 2.3 Freedom from leaks/holding pressure

Close the control valve on the 3-way valve, bridge the fuel pump and switch off the pump after 3-5 seconds.
Read off the holding pressure after 10 and 20 minutes; for pressures, see manufacturer's data.

# 3. Testing vehicles with electronic multi-point injection systems, e.g. Bosch I-/LH-Jetronic, Motronic, MPI, HMPI, EFI and Digifant.

### 3.1 System pressure




- Carefully disconnect the fuel line at a suitable point to depressurise the system.
- Establish connection **A** at the 3-way valve in the feed system downstream of the filter.
- Establish connection **B** at the 3-way valve in the direction of the fuel injectors/fuel distributor pipe.
- If a test connection is available on the vehicle, use only the connection at the 3-way valve. In this case, the control valve on the 3-way valve remains closed.
- Alternatively, connect the pressure gauge direct, without the 3-way valve.
- The system pressure can be checked with the engine running or stopped.

#### 3.1.1 Engine stopped

- Remove the pump relay and connect cable terminals 30 and 87 with an auxiliary cable with integral 20 A fuse. Switch on the ignition; the fuel pump must now run.
- Read off the system pressure on the pressure gauge. For the specified pressure, see manufacturer's data.

#### 3.1.2 Engine running

With the engine running, read off the system pressure on the pressure gauge; for the specified pressure, see manufacturer's data.

### 3.2 Freedom from leaks/holding pressure

Run the fuel pump or engine; shut down after 3-5 seconds. Read off the holding pressure on the pressure gauge at intervals as specified by the manufacturer (e.g. 3 mins and 5 mins).

### 3.3 Testing the pressure regulator

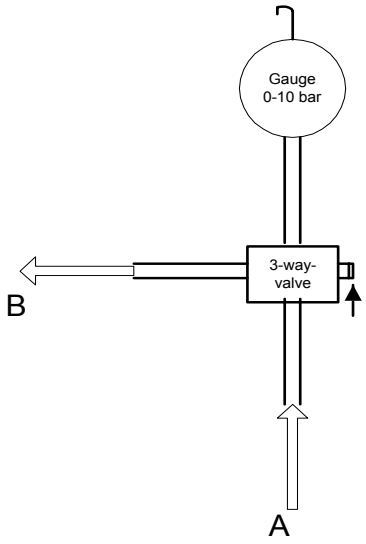
If it is suspected that the system pressure is incorrect, test the pressure regulator as follows:

- Run the engine or fuel pump and read off the system pressure.
- Close the return line; the pressure in the system must now rise sharply (delivery pressure).
- Read off the pressure on the pressure gauge and compare with manufacturer's specification (if delivery pressure is specified).
- Re-open the return line and remove the vacuum hose from the pressure regulator. Read off and record the pressure.
- With a vacuum pump (e.g. HV84/90) apply 500 mbar differential pressure. The system pressure must fall. Read off the pressure and compare with the previous pressure; pressure differential approx. 0.5 bar.

# 4. Testing vehicles with central injection systems, e.g. Bosch Mono-Jetronic, Opel Multec, Weber CFI.

### 4.1 System pressure

- Carefully disconnect the fuel line at a suitable point to depressurise the system.
- Establish connection A at the 3-way valve in the feed system downstream of the filter.
- Establish connection B at the 3-way valve in the feed system.
- The system pressure can be checked with the engine running or stopped.




### 4.1.1 Engine running

With the engine running, read off the system pressure on the pressure gauge; for the specified pressure, see manufacturer's data.

### 4.1.2 Engine stopped

- Remove the pump relay and connect cable terminals 30 and 87 with an auxiliary cable with integral 20 A fuse. Switch on the ignition; the fuel pump must now run.
- Read off the system pressure on the pressure gauge. For the specified pressure, see manufacturer's data.

### 4.2 Delivery pressure

Run the engine or fuel pump. Close the return line and read off the delivery pressure on the pressure gauge; for the specified pressure, see manufacturer's data.

### 4.3 Freedom from leaks/holding pressure

Run the fuel pump or engine for 3-5 seconds, then shut down. Compare the drop in pressure after 5 and 10 minutes with manufacturer's data.

### 5. Measuring the delivery quantity

When checking an injection system, measure the quantity of fuel delivered by the electric fuel pump in addition to the pressures. For this purpose, we recommend a standard 2000 cc measuring glass.

- Disconnect the fuel line at a suitable point in the feed system (follow the vehicle manufacturer's instructions).
- Hold the disconnected fuel line or, if necessary, auxiliary line in the measuring glass.
- Remove the pump relay and connect cable terminals 30 and 87 with an auxiliary cable with integral 20 A fuse.
- Switch on the ignition; the fuel pump must now run.
- Collect the fuel in the measuring glass and read off the delivered quantity after 10-15 seconds (observe the manufacturer's data). (See manufacturer's data for specified quantity , guideline 1.5-2.0 litres in 10 seconds).

**Note:**
The LR 180/4 features a drain valve and vent valve.