



## MASTER COMMON RAIL HIGH PRESSURE TESTER CT5608



### GENERAL

Essential tool for proper diagnosis of common rail systems.

This tester can check the real pressure in the high pressure circuit in Common Rail system using a high pressure gauge (2000 bar) and high pressure flexible hoses.

The kit also includes a set of dummy pump regulator and injector pipe blanks.

For a variety of tests :

Engine cranking/running pressure test

Maximum pump pressure test

Pump pressure regulator test

Injector leakage test

### SAFETY INFORMATION

DO NOT Crack fuel lines under pressure or to bleed air from system.

DO NOT Check for leaks with hands or by leaning over engine.

Always wear suitable safety eye protection, overalls and heavy duty protective gloves or gauntlets.

DO NOT wear jewellery. Tie back long hair.

Always check for leaks from a distance visually and/or by using a long piece of card or wood to wipe against the pipe or component being checked.

Always wait at least 20 minutes for the fuel system to naturally de-pressurise with the vehicles engine switched off before loosening/disconnecting pipework.

Always loosen pipework with a cloth wrapped around the fitting/nut to reduce the likelihood of spray if system is unexpectedly pressurised.

Always read manufacturers information for the fuel system being worked on before commencing work on the fuel system.

DO NOT use tools if damaged.

Maintain tools to ensure that they are in an adequate condition for safe use and optimum performance.

Ensure that a vehicle that has been raised by a jack is adequately supported. Use axle stands.

DO NOT leave tools in or near the engine. Return tools to suitable storage after use. Account for all tools, parts and components being used.

When not in use, store in a safe dry and childproof place.

Keep children and unauthorised persons away from the work area.

With high pressure common rail systems, cleanliness is very important. Check before connecting any pipes or hoses that they are perfectly clean.

Make sure vehicle has sufficient fuel before testing.

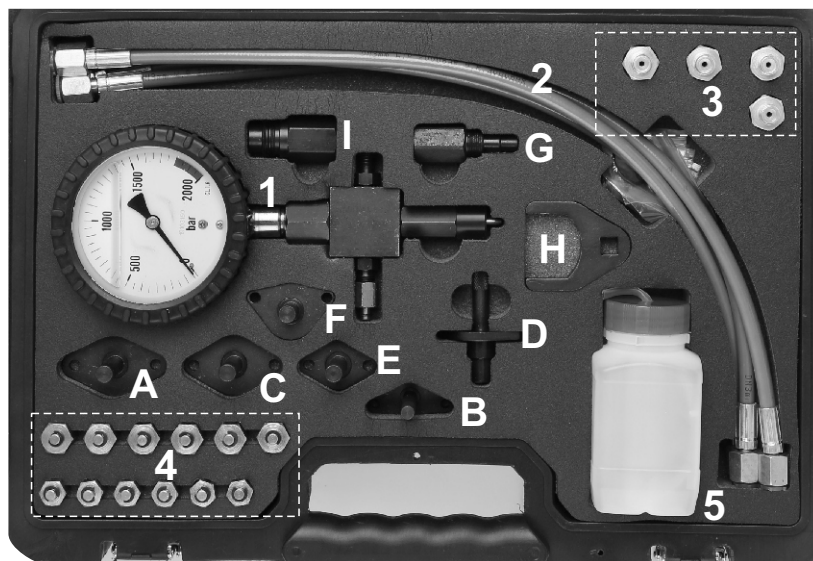
After use, Keep the tools clean and dry.

Replace any damaged parts.

Do not drop or subject equipment to abnormal shock loadings.

## CONTENTS

1	Gauge Pressure range	0-2000bar
2	Flexible hoses length	500mm(4pcs)
3	Hoses connection	M12x1.5(x2), M14x1.5(x2)
4	Injector pipe blanks	M12x1.5(x6), M14x1.5(x6)
5	Diesel waste bottle	
	Dummy Regulators	A: Bosch CP1 B: Bosch CP3 C: Delphi DFP1/DFP3 D: Denso HP3 E: Denso HP1/HP2 F: Siemens DCP2 G: Siemens DCP1 H: Siemens DCP1 y DCP2 I: Llave Siemnes



## INSTRUCTION

### Engine cranking/running pressure test

Connect gauge in series, to the vehicles high pressure circuit. This will allow the engine to operate as normal giving the actual fuel pressure reading.

Locate high pressure pipe from pump to the fuel rail. If access is difficult, locate the pipes from fuel rail to injector. With fuel system de-pressurised, disconnect accessible high pressure pipe and connect gauge with either M12 or M14 hoses. Make sure all hose fittings are tight before proceeding. (Fig 1)

Connect diesel waste bottle with tube to bottom of gauge. The bottle will collect the waste fuel when the pressure relief valve has activated.(Fig 1)

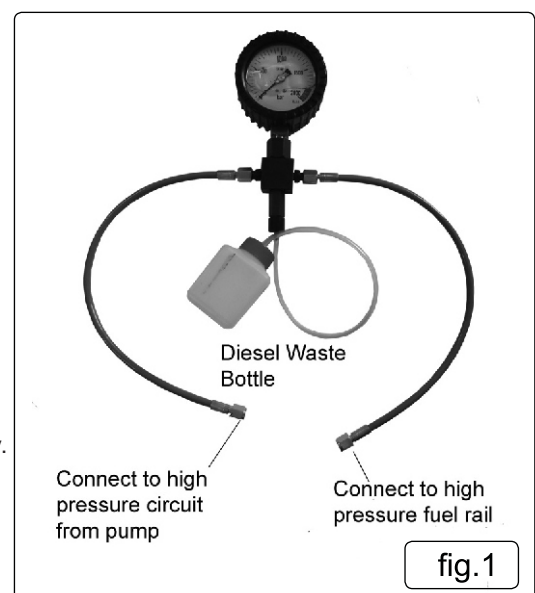
Crank/start engine. It may take a few seconds for the engine to start due to air in the system. With engine cranking and at idle the reading should be around 300bar.

A non-starting vehicle should still have a reading of 300bar.

With engine running, visually check there are no fuel leaks before proceeding. If a fuel leak is found, switch off engine and allow system to de-pressurise before checking fittings are tight/sealing correctly. Once done, start engine and check for leaks again.

Increase engine speed making sure the fuel pressure increases accordingly.

The most important parameter to test is that 300bar should be achieved with the engine idling or activating the starter. If this pressure is correct, we can deduce that the low-pressure circuit is working properly and the high pressure pump is supplying the minimum pressure needed to start the engine properly.



In the event that the pressure is correct but the engine does not start, you should find what the problem is, which will not be the high pressure pump. The problem could be an electrical fault, injector, etc...

If the pressure does not reach the required pressure you should follow the following steps:

1. Test the pressure at the inlet of the high pressure pump with a low pressure tester (not supplied).
2. If the pressure at the high pressure pump inlet is correct, you must check the maximum pressure of the pump .  
(See "Maximum pump pressure" section).

### Maximum pump pressure test

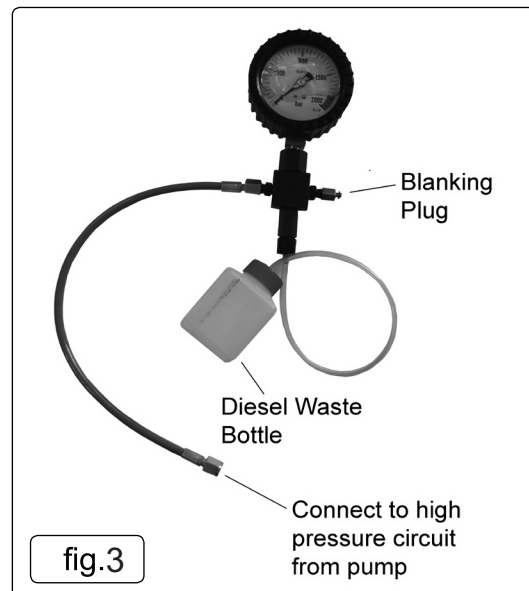
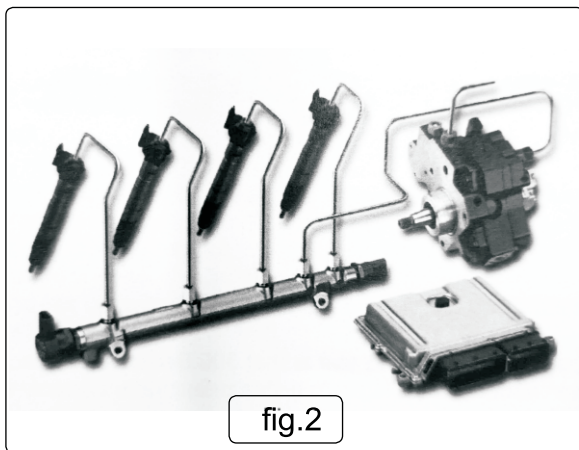
There are high pressure pumps which disconnect the third piston when the pressure required is low, so they work only with the two pistons, whereby the engine power requirement is less. The third piston is activated by a solenoid when 600-700bar is reached.

Connect gauge to the vehicles high pressure circuit. This will not allow the engine to start and testing is done with engine cranking only. Pressure should rise to above 1050bar which shows the pump is working correctly.

Locate high pressure pipe from pump to the fuel rail. If access is difficult, locate the pipes from fuel rail to injector.(Fig 2)

With fuel system de-pressurised, disconnect accessible high pressure pipe and connect gauge with either M12 or M14 hose. Fit blanking plug to gauge outlet. Make sure hose fittings are tight before proceeding. (Fig 3)

Connect diesel waste bottle with tube to bottom of gauge. The bottle will collect the waste fuel when the pressure relief valve has activated. (Fig 2)



Crank engine. Pressure should quickly increase to above 1050bar. This indicates the pump is working correctly. If pressure reading is low it indicates the pump or pressure regulator is at fault. To identify which is faulty carry out a pump pressure regulator test.

Note - A problem with the pressure sensor (located on the fuel rail) can send the wrong information to the PCM and therefore give the wrong information to the pressure regulator causing it to open early resulting in a low pressure reading. This can be checked using an EOBD tool with live data and comparing the actual pressure from the gauge to the reading from the EOBD tool.

### Pump pressure regulator test

Essential test to determine if the fault is caused by a faulty pump or regulator when there is a low maximum pressure.

With fuel system de-pressurised, remove pressure regulator from pump.

Select the required dummy regulator and fit to pump.

Carry out "Maximum pump pressure test" If the pressure now increases to above 1050bar it indicates the regulator is at fault. If pressure is still low the pump will be at fault.

Note - A problem with the pressure sensor (located on the fuel rail) can send the wrong information to the PCM and therefore give the wrong information to the pressure regulator causing it to open early resulting in a low pressure reading. This can be checked using an EOBD tool with live data and comparing the actual pressure from the gauge to the reading from the EOBD tool.

## **Injector leakage test**

The Injector pipe blanks is designed to be used together with gauge & hose.

This test should be carried out when the cranking pump pressure doesn't reach 300bar not allowing the vehicle to start. By blanking the injector pipes it will show if the loss of pressure is due to faulty injectors (sticking open).

With fuel system de-pressurised, disconnect high pressure pipes to the injectors and fit Injector pipe blanks. (Part 4)

Carry out "Engine cranking/running pressure above".

If pressure has now increased it will show that at least one of the injectors was leaking.

To identify which injector is leaking, connect injector pipes individually and repeat test.

If pressure is still lower it may be a faulty with the pump or pressure regulator.