

# NCT-1000 Users Manual



## NCT – 1000 KIT



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1. TOOL CASE
2. RAIL PLUG (12mm) 5ea (1 for spare)
3. RAIL PLUG (14mm) 5ea (1 for spare)
4. FLASK & HOLDER 1ea
5. VISIBLE TUBE 4ea
6. INJECTOR RETURN HOSE ADAPTER 4ea
7. INJECTOR RETURN HOSE PLUG (TUBE)
8. CLEAN CASE 1ea
9. DUST CAP
10. HIGH PRESSURE GAUGE with PRV CONTROLLER
11. LOW PRESSURE GAUGE
12. VACUUM GAUGE
13. GAUGE CONNECTION TUBE
14. CONNECTION ADAPTER WITH HOSE
15. CONNECTION ADAPTER
16. FUEL FILTER PLUG( for Delphi system)
17. ADAPTER CONNECTOR ( for Bosch )
18. ADAPTER CONNECTOR (for Delphi New)
19. ADAPTER CONNECTOR (for Delphi Old)
20. DUMMY RESISTER
21. USER'S MANUAL
22. DUMMY RESISTER (HP Sensor)

This Tester has been developed to diagnose common rail diesel system efficiently and accurately.

### 1-1. CRITERIA OF DIAGNOSIS USING COMMON RAIL TESTER

#### Impossible to start engine or engine stall while driving

\* NCT-1000 is not a **INJECTOR TESTER**. If vehicle has different symptoms such as engine vibration or black/white smoke emitting while engine idle, the problem may due to unevenness injection from injectors. It would recommend to perform Power Balance Test (Injector quantity comparison) using scan tool (Hi-Scan, GDS or G-Scan) or **NCT-2000**, Injector Tester.

### 1-2. DIAGNOSIS PROCEDURE ACCORDING TO SYMPTOM

1) When the engine is not able to start

① Injector Back Leak Test (Static Test) → ② Low Pressure Pump Test → ③ High Pressure Pump Test

2) When the engine is able to start

① Injector Back Leak Test (Dynamic Test) → ② Low Pressure Pump Test → ③ High Pressure Pump Test

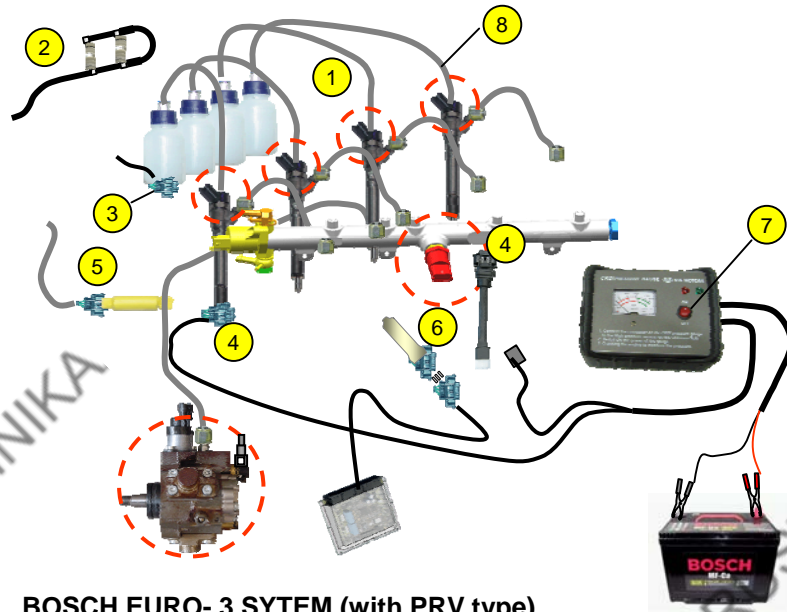
CRDi system has many precision-made components. If any foreign particle (even extremely small) enters the system, it may cause to have injector clogging or sticking. Therefore, make sure to protect fuel lines from any dust or contamination during service.

## STEP 1-1

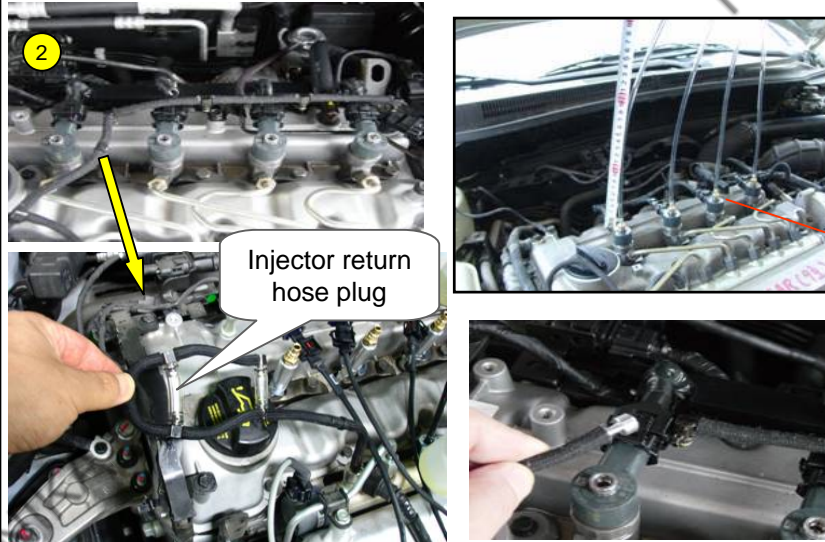
Conduct this test when the engine is not able to start, otherwise( if possible to start) skip this test and conduct "STEP 1-2 DYNAMIC TEST" instead.



### INJECTOR BACK LEAK TEST WITH STATIC ( Test with engine cranking)



### BOSCH EURO- 3 SYTEM (with PRV type)



**Purpose of this test is to measure the amount of injector back leak and to check the performance of High pressure pump.**

**\* If injector back leak amount is too much High pressure pump's performance test will not be performed correctly. proceed Step 3-1 thru step 3-2 in this case.**

### TEST PROCEDURE

- 1) Install the Back Leak tube① and the flask to injectors.
- 2) Block the fuel return hose② with plug.
- 3) Remove the wiring connectors from all Injectors and PRV.
- 4) Install the high pressure gauge.
- 5) Install the PRV dummy resistor to the connector of PRV control wire.
- 6) Install the HP sensor dummy resistor to the connector of HP sensor control wire.  
Purpose of Dummy resistor is to prevent fail safe mode by ECU.
- 7) Turn on the power supply switch⑦ of the high pressure gauge.
- 8) Crank the engine a few seconds to build high pressure and to do air bleeding.  
Crank the engine again and measure the maximum high pressure of the pump
- 9) To prepare measuring back leak amount, empty visible tubes removing the injector return hose adapter from injector.
- 10) Crank the engine once for 5 to 6 seconds and measure the back leak amount from each visible tube.

### SERVICE SPEC

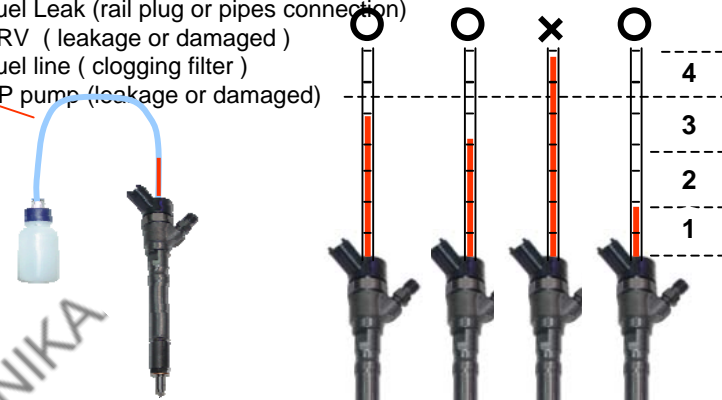
**High pressure :** Above 700 bar ( with normal Back Leak condition)

※ Too much back leak amount leads rail pressure down and cause insufficient high pressure.

**Back Leak :** Less than 3.5 times than minimum amount injector

### CHECK POINT ( if test was failed )

- Fuel Leak (rail plug or pipes connection)
- PRV ( leakage or damaged )
- Fuel line ( clogging filter )
- HP pump (leakage or damaged)

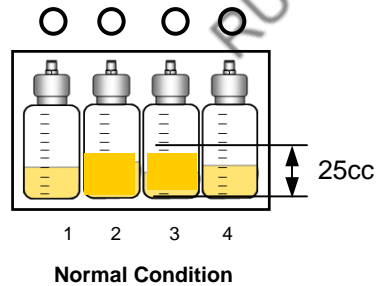
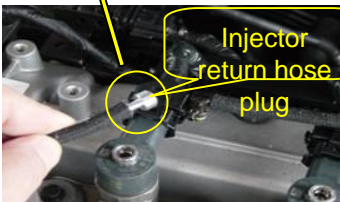
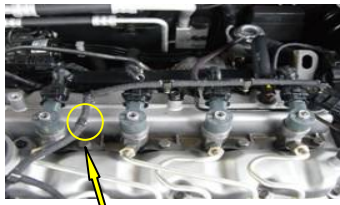


# STEP 1-2

Conduct this test when the engine is able to start, otherwise( if unable to start) skip this test and conduct "STEP 1-1 STATIC TEST" instead.



## INJECTOR BACK LEAK TEST WITH DYNAMIC (Test with engine running)



Purpose of this test is to measure the amount of injector back leak.

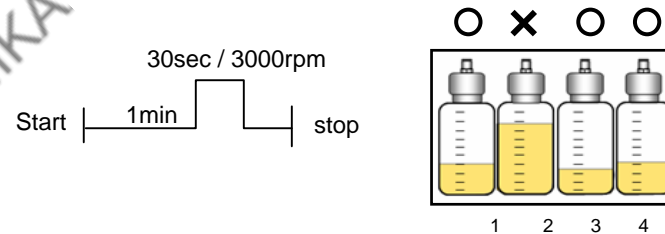
### TEST PROCEDURE

- 1) Remove the fuel return hose from each injector
- 2) Install injector back leak test kit to the Injectors
- 3) Conduct the BACK LEAK test referring to following explanation.

#### BOSCH system

- ① Start engine → 1minute at idle → up to 3000rpm for 30sec → Stop
- ② Measure the amount of fuel in each test bottle

SERVICE SPEC : Less than 3.5 times than minimum amount injector



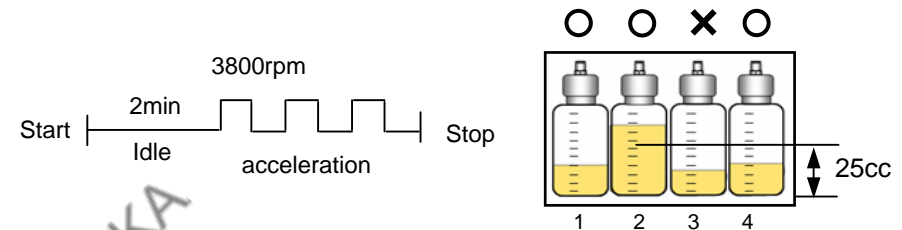
#### DELPHI SYSTEM (HP 2.9)

- ① Connect the Hi-Scan and select the 'High Pressure Leak Test' mode.
- ② Conduct the 'High Pressure Leak Test' until the Hi-Scan finish the test automatically.

or manually :

Start engine → 2minutes at idle → 3 times acceleration → Stop engine

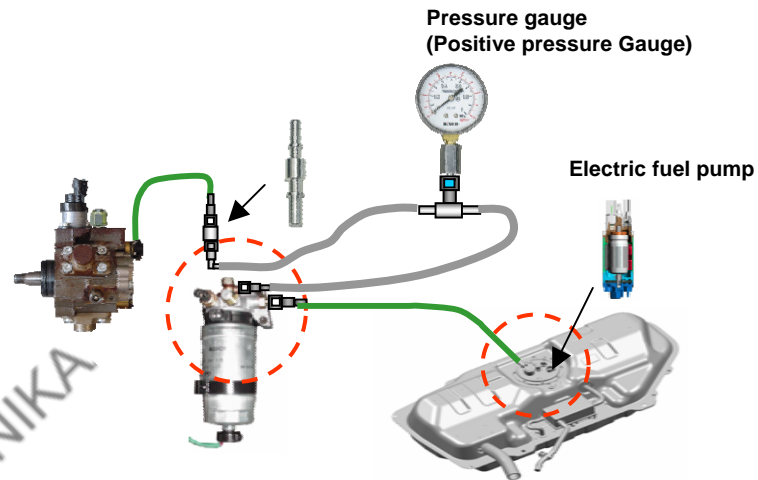
SERVICE SPEC : Less than 25cc



## STEP 2-1 LOW PRESSURE TEST for each system

### ELECTRIC PUMP TYPE

Purpose of this test is to check the condition of the fuel line, blockage, performance of the feed pump, etc.



#### NOTE

- Only for Electric fuel pump type vehicles

EURO IV : 2 ~ 4.5 bar

OTHERS : 1.5 ~ 3 bar

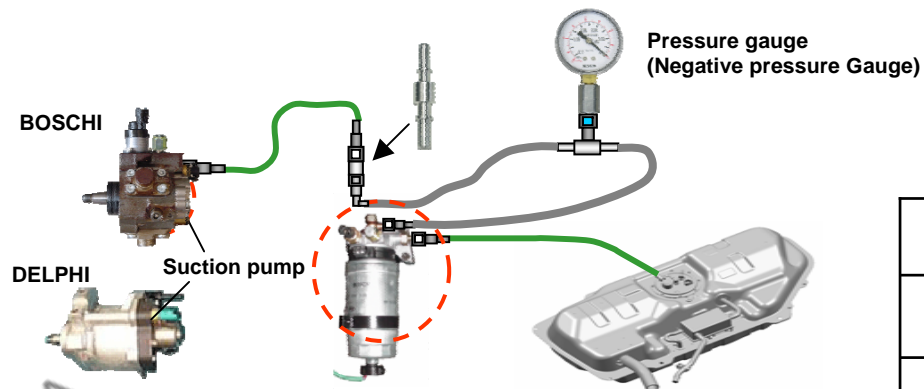
Diagnostic factor	Symptoms
Fuel filter	<ul style="list-style-type: none"> <li>• Immediate engine stall after initial starting</li> <li>• Lack of engine power</li> </ul>
Pump	Hard to start / Engine stall

### SUCTION PUMP TYPE

#### NOTE

- Only for the Suction pump type Vehicles

SERVICE SPEC : 8 ~ 25 cm Hg



Diagnostic factor	Symptoms
Fuel filter	<ul style="list-style-type: none"> <li>• Immediate engine stall after initial starting</li> <li>• Lack of engine power</li> </ul>
Pump	Hard to start / Engine stall



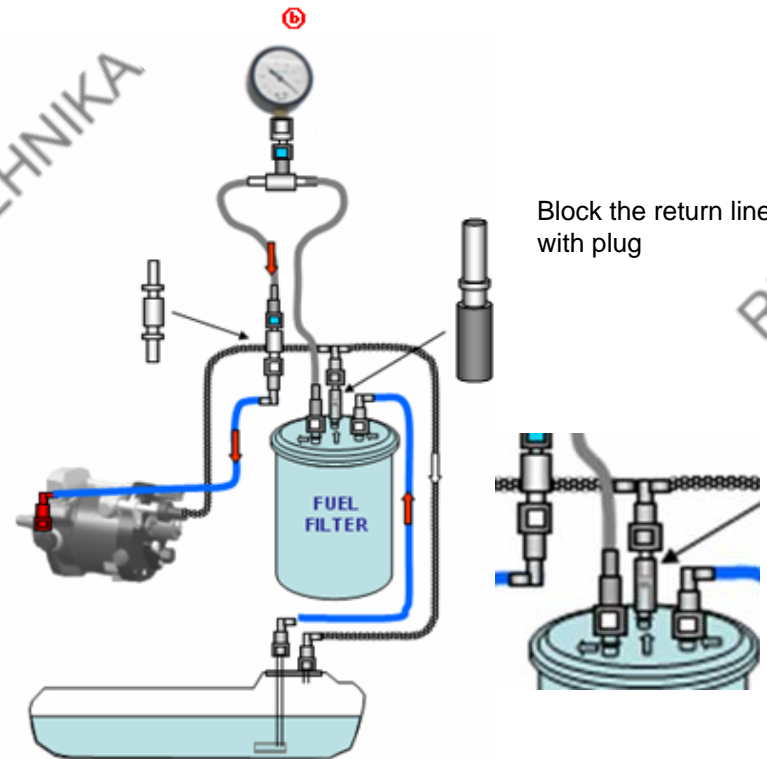
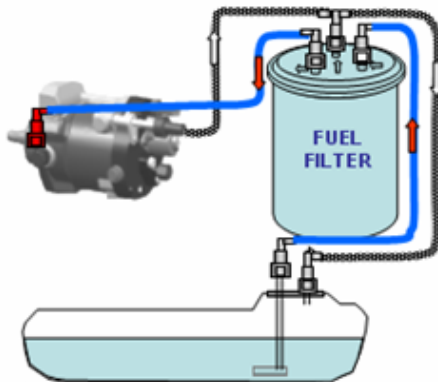
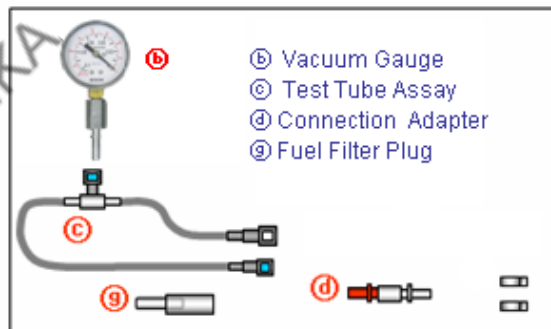
## STEP 2-2 LOW PRESSURE TEST for each system

### INTERNAL SUCTION PUMP TYPE (DELPHI)

Purpose of this test is to check the condition of the fuel line, blockage, performance of the feed pump, etc.

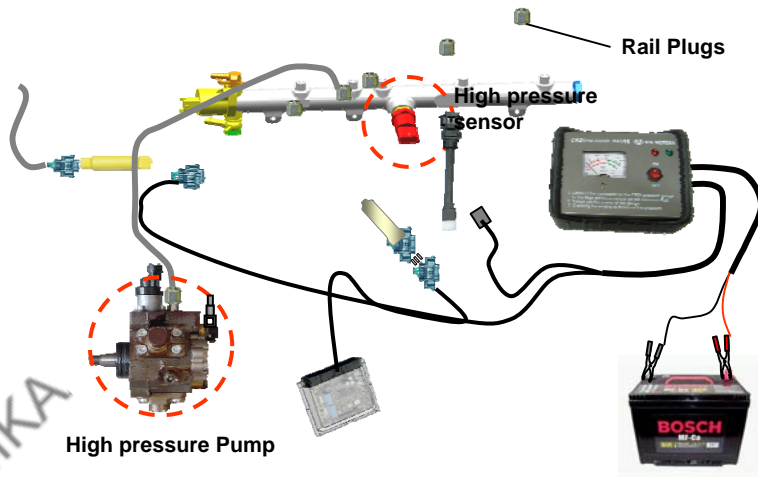
VACUUM	JUDGMENT
8~19 cmHg	System normal
20~60 cmHg	Filter or line clogging (pump OK)
0~7 cmHg	Air leak in to the system or Pump problem

### Internal suction pump type (Delphi)



## STEP 3-1 HIGH PRESSURE TEST

### HIGH PRESSURE TEST WITHOUT INJECTOR



**BOSCH EURO- 3 SYTEM (with PRV type)**

Purpose of this test is to confirm the High pressure pump performance and to reconfirm high pressure pump performance when high pressure value is lower than 700bar measured during Step 1-1.

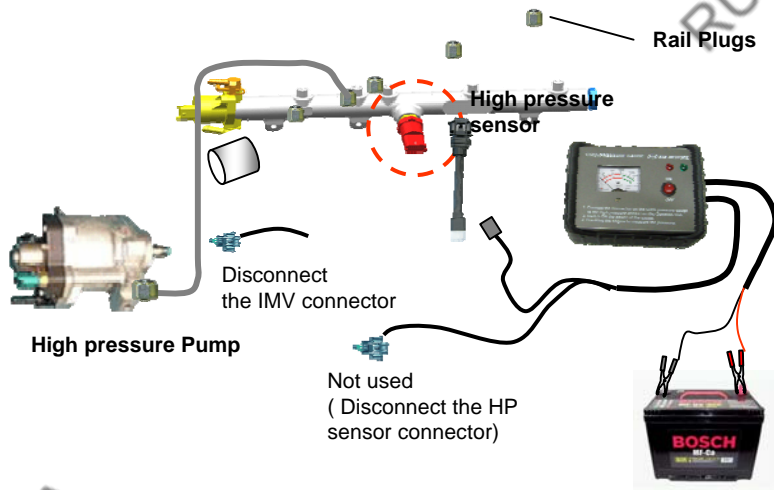
Avoiding injector back leak completely by blocking the rail outlet you can find out whether the lack of pressure was really caused by high pressure pump faulty.

#### TEST PROCEDURE

- Remove the Injector pipes from the rail
- Install the dummy resistors(for PRV & HPS) to the connector of it's control wire.
- Block the rail outlet using RAIL PLUG ( 4 ea )
- Install the high pressure gauge
- Select mode switch of the gauge to Max High position
- Crank the engine to check the maximum High pressure
- If the pressure is over 1400bar stop cranking immediately to avoid damage of High pressure pump due to overload.

SERVICE SPEC : Above 900 bar

If measured pressure is above 900bar,the high pressure is normal.



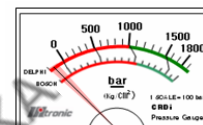
**DELPHI or EURO- 2 SYTEM (without PRV type)**

#### TEST PROCEDURE

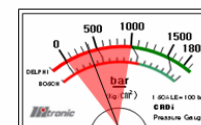
- Remove the Injector pipes from the rail
- Removed the wiring connector of Inlet Metering Valve (IMV)
- Block the rail outlet using RAIL PLUG
- Install the high pressure gauge
- Selector mode switch of the gauge to Max High position
- Crank the engine to check the maximum High pressure
- If the pressure is over 1400bar stop cranking to avoid damage of High pressure pump due to overload.

SERVICE SPEC : Above 1000 bar

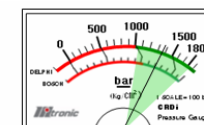
If measured pressure is above 1000bar,the high pressure is normal.



Sensor problem



Low pressure

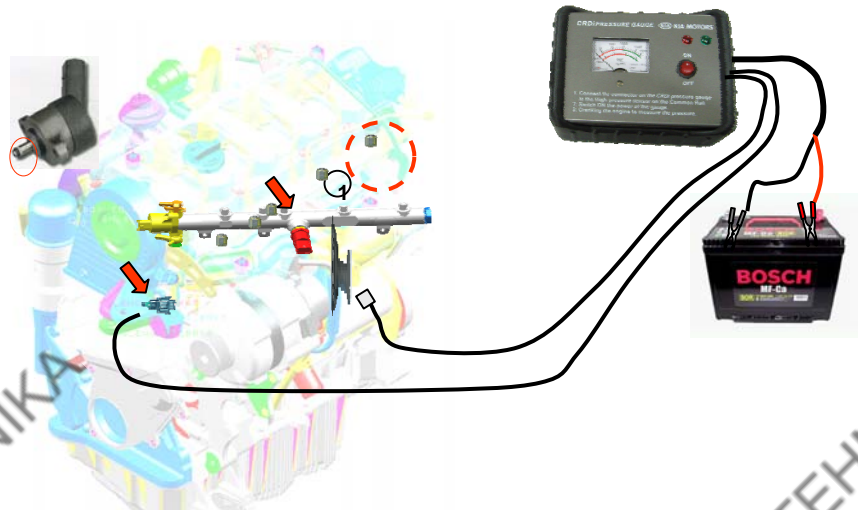


Normal

# STEP 3-1 HIGH PRESSURE TEST



## PRESSURE REGULATOR VALVE DIAGNOSIS

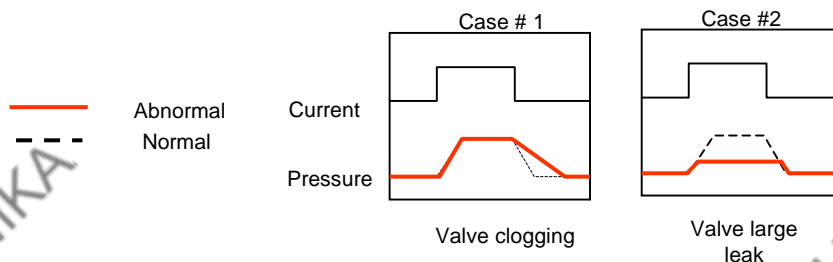


Using HIGH PRESSURE GAUGE you can build or reduce rail pressure.

### TEST PROCEDURE

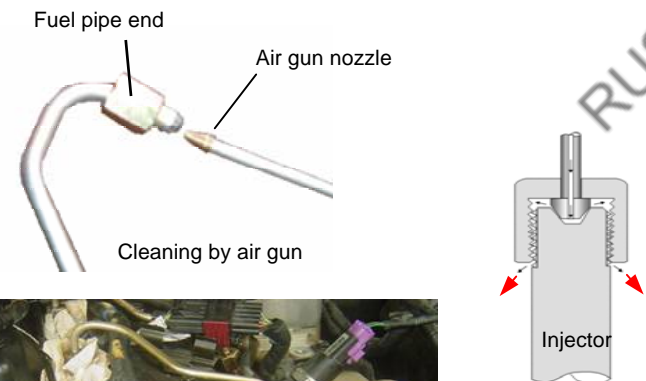
- 1) Install the High Pressure controller & Tester
- 2) Select the MODE switch to HIGH mode
- 3) Crank the engine to build the high pressure
- 4) Turn on the power switch to create rail pressure and turn off the switch to decay the pressure. Watch the response of needle of gauge during the power switch is on and off .

Case 1 : Pressure drop delayed = Valve screen may clogged  
 Case 2 : Pressure was not increased or delayed = Valve leakage



### When assemble fuel pipe after test

- 1) Before connecting the fuel pipes to the engine, be sure that all the pipe outlet surfaces, inner passages, and especially fuel pipe fitting nuts are clean. Clean using air gun if necessary.
- 2) Assemble all fuel pipes except the fuel pipe fitting nuts of injector side.
- 3) Temporarily tighten the fuel pipe fitting nuts to injectors by hand .
- 4) To prevent contamination on engine room, wrap up around the injector pipes using paper towel or shop rag as shown.
- 5) Crank the engine 2 - 3 times for 5 - 6 seconds to remove dusts from injector connection area.
- 6) Tighten the nuts with specified torque using torque wrench.
- 7) Erase the DTC code by scan tool.



Loosen the nuts  
 Tighten the nuts

Paper towel

## ● Introducing CIT-2000 (injector Tester)



This new Injector Tester NCT- 2000 is developed in addition to CNCT-1000, in order to improve diagnostic efficiency and accuracy for vehicles equipped with Common Rail System.

CIT-2000 enables Injection Quantity Comparison Test under Low and High fuel pressure conditions, which it was not possible with Hi-scan or NCT-1000.

Also Cylinder compression and Rail pressure regulator test are additionally available.

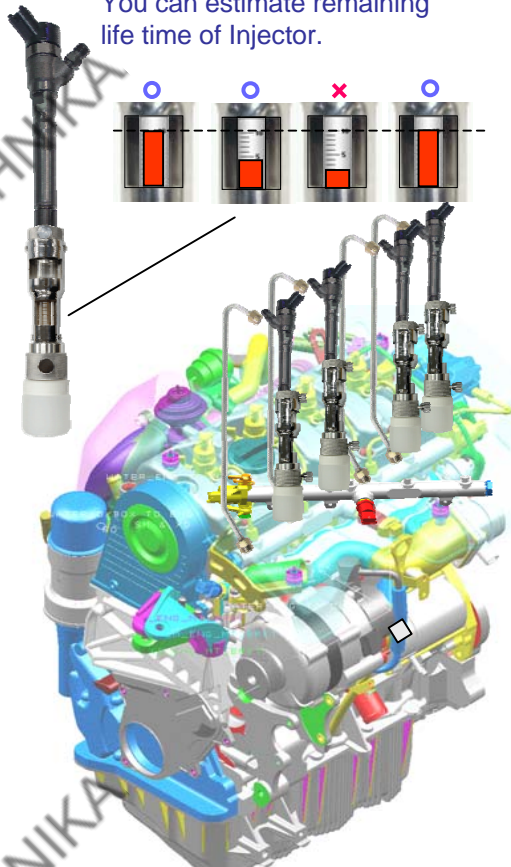
Above all, most benefit is that you can show the real condition of Injector to customers.

Tool supplier : Nextech Co., Ltd.  
Contact Point : Mr. Alex Lim  
Tel : +82-2-3140-1489 or 1443  
Fax : +82-2-3140-1449  
E-mail : sales@nex-tek.com

### 1. INJECTOR TEST

#### Injection quantity Comparison Test

You can estimate remaining life time of Injector.

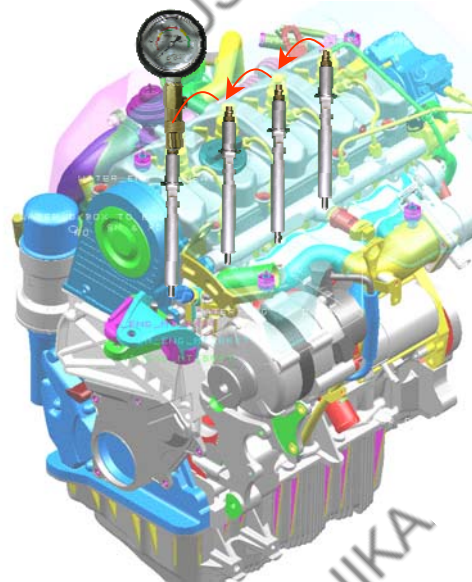


### 2. COMPRESSION TEST

#### Cylinder Compression Comparison Test



Dummy injectors with multiple adapter to cope with variable injector type and quick coupling for gauge



### 3. PRV ACTUATION TEST

#### Pressure Regulator Valve Actuation Test,

