Introduction to CNC-603A Injector Cleaning Detector

Prepared by IT Department

Introduction：

This is a mechatronics product which integrates ultrasonic cleaning technique with microprocessor fuel pressure control cleaning detection technology to simulate various kinds of working conditions, clean and inspect the injector of the vehicle, as well as perform free disassembly cleaning on the injector and fuel supply system.

Features:

● Applied ultrasonic cleaning technology with powerful effect and free disassembly cleaning.

● Detection of uniformity and atomization, sealing performance, fuel injection quantity and automatic cleaning.

● Applied microcomputer based voltage control technology, with stable fuel pressure, widely adjustable range, to fit in various gasoline injection systems, realizing automatic injector cleaning detection.

●Applied microcomputer automatic control and digital display technology, to automatically control the cleaning and detection process, and perform real time monitoring on the major parameters.

● Applied automatic oil drain control technology, to automatically discharge oil during detection process via the program, and also manually drain oil via the control panel after the detection finishes.

Advantages：

● Main machine integrated with the ultrasonic cleaning box

● LCD screen displays menu and operating parameters

● Clean appearance, integrated design

● Tiny and portable, easy to carry and use

Technical parameters：

Parameters	
Power	AC220V±10% 50Hz/60HzAC110V±10% 50Hz/60Hz
Input power	230W
Cleaning power	100W
Speed	10~9990rpm step length：10 rpm
Time	1~9999s
Pulse width	0.5~25ms step length：0.1ms
Fuel tank	2500mL
Dimension	365×350×420（mm）
Net weight	8kg

Applications:

● Atomization

● Control air fuel ratio

Structure and work principle:

● Consists of a filter, a return spring, a needle valve and an

electromagnetic coil.

● Based on the working condition of the engine, ECU control

s on-off time of the solenoid valve and the fuel injection qu

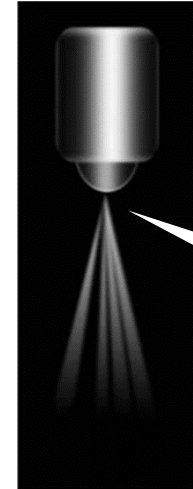antity of the injector so as to control the air fuel ratio.
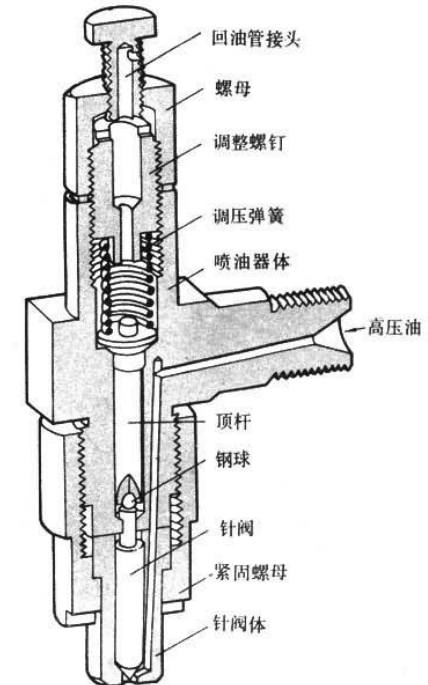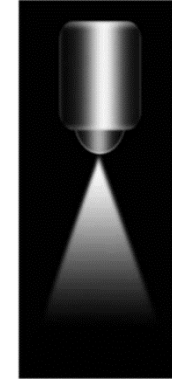
回油管接头
螺母
调整螺钉
调压弹簧
喷油器体
高压油
顶杆
钢球
针阀
紧固螺母
针阀体
闭式喷油器

Impacts of general faults:

Faults generally result from carbon deposition;

● Needle valve nozzle leakage: mixed gas too rich,

　　black smoke giving off, difficult to start the

　　engine, engine shaking, exhaust emission

　　exceeding limit

Carbon deposition mainly comes out from the needle valve nozzle.

● Needle valve blocked：

No fuel supply, mixed gas lean,

insufficient power, bad

atomization, uneven injection

quantity.

● Internal spring or coil fault

## Traditional injector cleaning：

Dismantle to clean(manual)

● During dismantling, the sealing ring might get

damaged and should be replaced which

increases the costs of the car owner. If not

replaced, the oil leakage from the injector might

get the car burned itself.

● It takes much time to dismantle and clean.

● In traditional way, only the injector is cleaned whil

the intake manifold, inlet valve and combustion

chamber are not cleaned. Thus the exhaust

emission will not be improved.

Ultrasonic cleaning injector:

● Clean one or a few injectors at a time which thoroughly cleans the carbon deposition of the injector.

● Reverse cleaning: completely clean the muck inside the injector and attached to the filter.

● Free dismantling cleaning: with various connectors, the free dismantling cleaning is applicable to different vehicle models.

● Uniformity detection: detect the uniformity of fuel injection quantity.

● Atomization detection: Use background light to watch the atomization status of the injector.

● Sealing performance test: detect the sealing performance and the injection quantity at the same leakage time and count under high pressure.

● Automatic cleaning detection: under specific working parameters, simulate the tests of injector under various conditions.

Ultrasonic cleaning machine:

电磁阀

油 箱

油泵
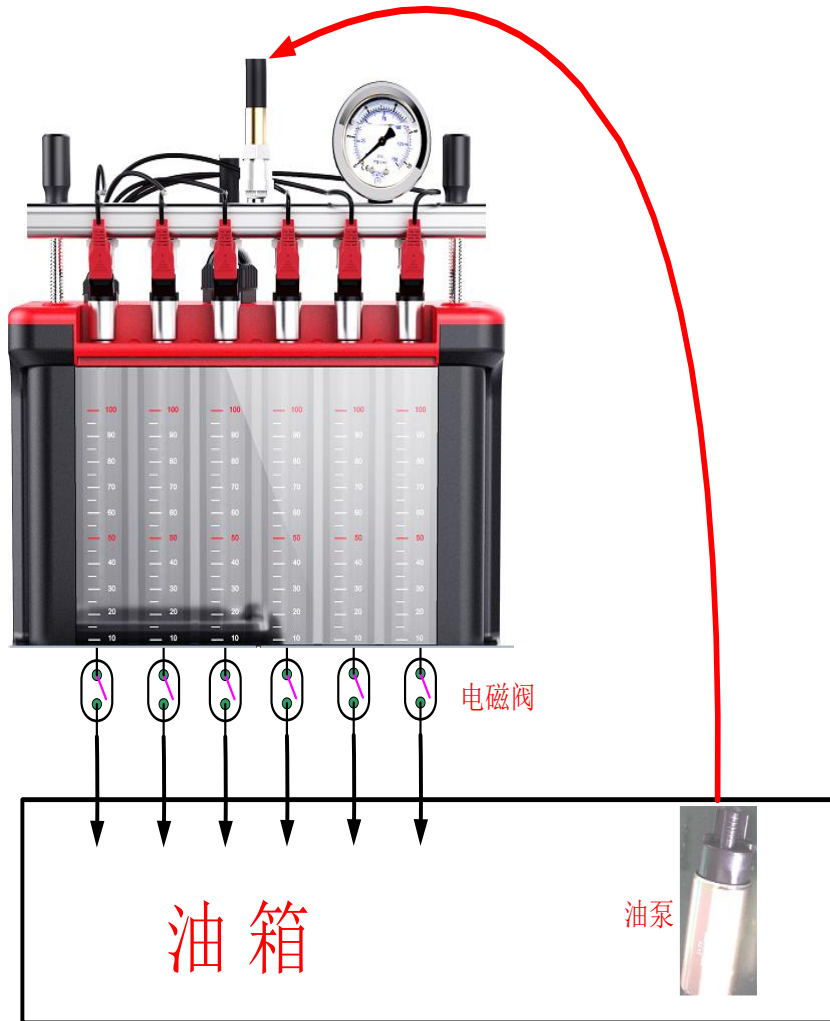
Ultrasonic work principle:

● Ultrasonic wave: the frequency is higher than upper auditory limit of human(about 20KHz). Long wavelength and high freqeuncy

● Ultrasonic cleaning: high frequency vibration signal from the ultrasonic washer can be converted to high frequency mechanic vibration via the transducer, spreading among the cleaning liquid to produce thousands of mini bubbles, which form and grow in the negative pressure area and close quickly in the positive pressure area. During the process, more than 1,000 instantaneous high pressure of atmospheric pressure can produce continuously. This is the well-known cavitation effects. It is as if a series of explosions hitting the surface and the gaps of the object so as to realize fully cleaning effect.
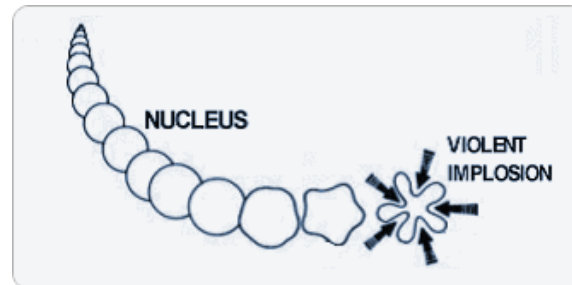
Considerations:

● Since cleaning liquid is corrosive, it can neither be used as detection liquid nor mixed with

the detection liquid.

Cleaning liquid is inflammable. Please keep it away from flame.

● Cleaning liquid can make the gelatinous substance (seal ring, oil pipe,etc) swell, so the

injector should not be rinsed for too long.

● You are supposed to mainly clean the needle valve nozzle.

● Don't power on the ultrasonic cleaning machine before adding the cleaning liquid because

it will get the machine easily damaged.
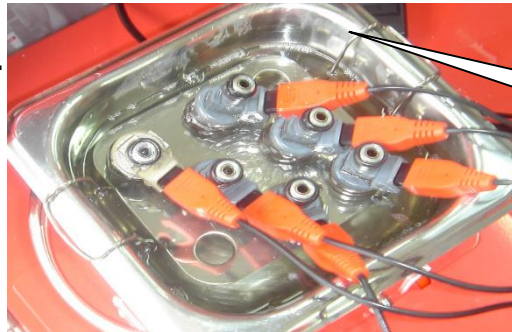
Note：too much cleaning liquid in this image; only the amount of liquid to submerge the head of the injector is needed

How to tell the cleaning effect and performance?

● Uniformity/atomization

● Sealing performance

● Fuel injection quantity

● Automatic cleaning detection

(under different working

conditions)

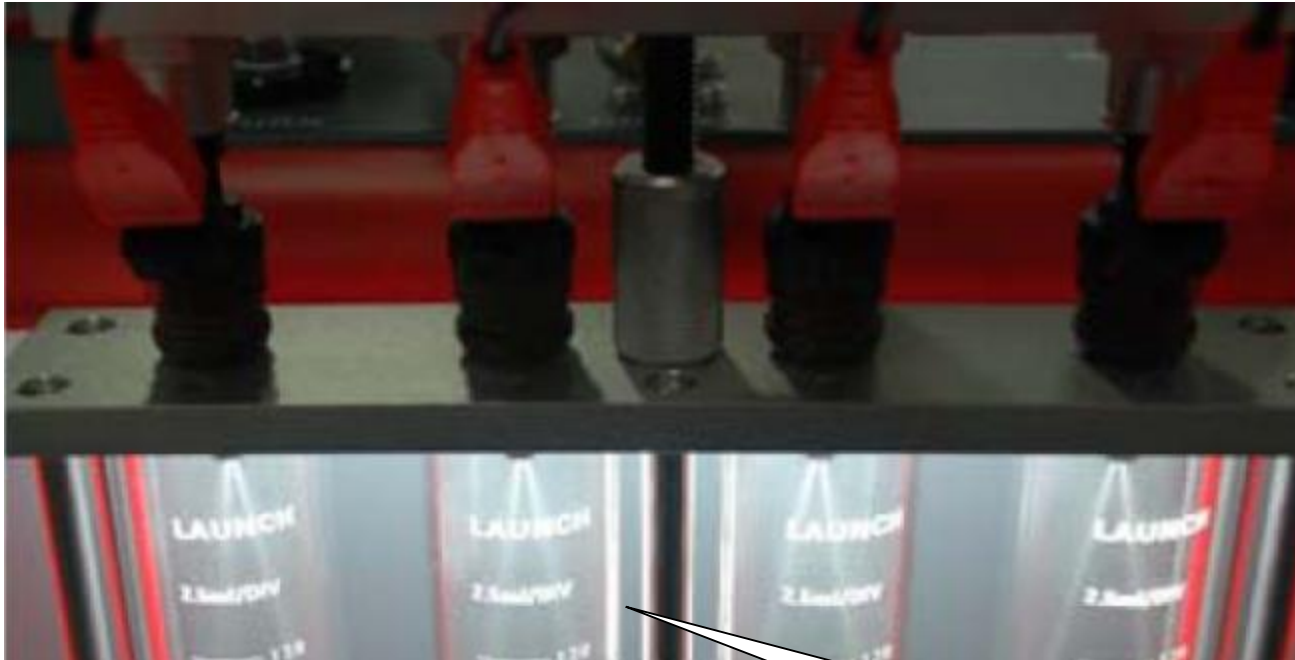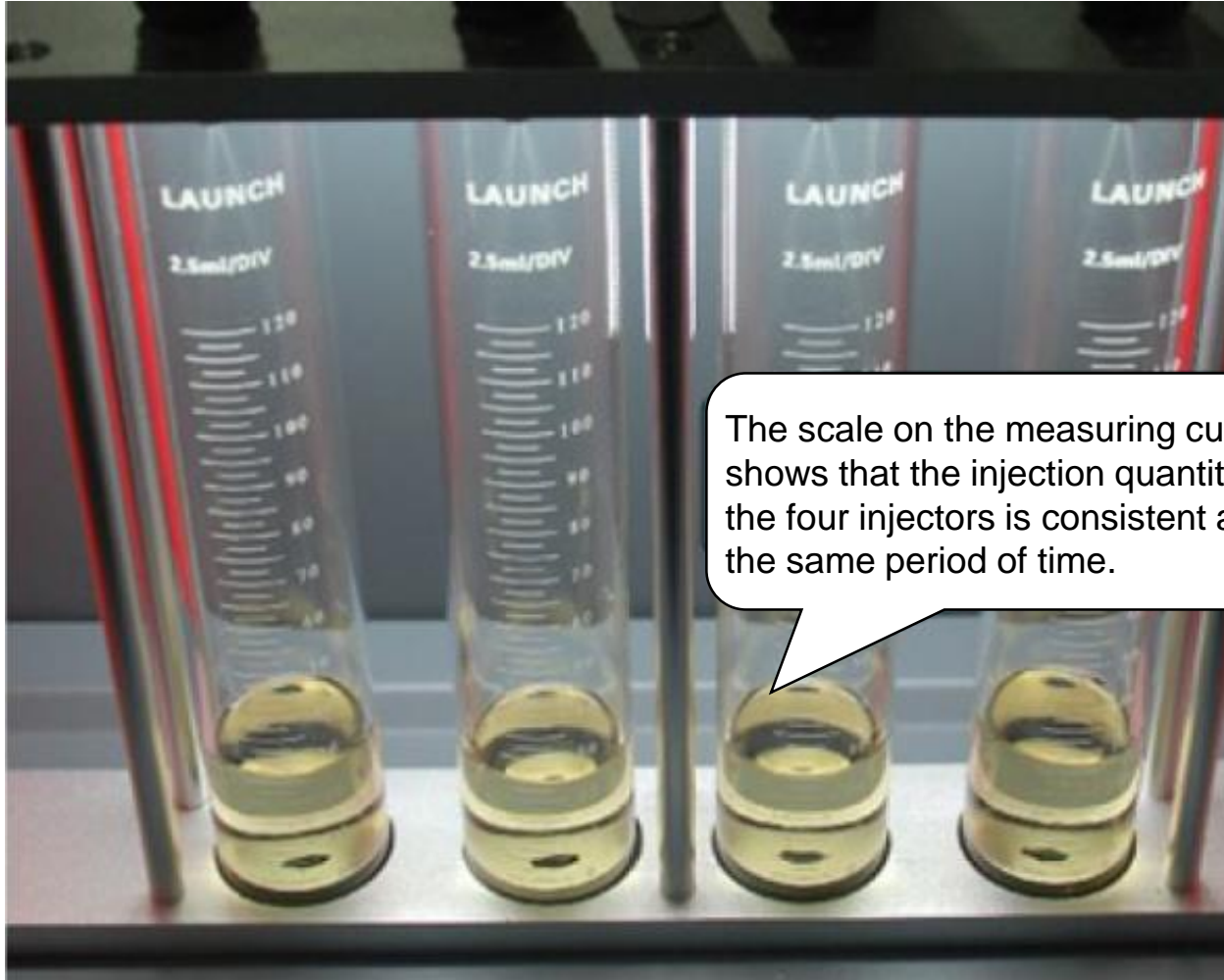喷油嘴清洗前   喷油嘴清洗后

The uniformity and atomization of the injectors can be demonstrated by displaying them on the detection bench. If they are inconsistent, it indicates the injector fault.

The atomization of the four injectors should be consistent and even without scattering or stripe jet.

The scale on the measuring cups shows that the injection quantity of the four injectors is consistent at the same period of time.

Comparison between CNC-603A
    and CNC-602A：

● **CNC-603A is smaller in size**

CNC-603A dimension：400mm x 410mm x 580mm

CNC-602A dimension：455mm x 350mm x 356mm

Easy to move and transport.

● **CNC-603A adopts one-style design**

CNC-603A cleaning machine integrated with detector

CNC-602A cleaning machine and detector are separated

More convenient to clean. Not easy to and easy to store.

● CNC-603A **operating interface more friendly**

CNC-603A interface： LCD screen

CNC-602A interface： LED display

● **CNC-603A fuel pressure display more intuitive**

CNC-603A: fuel pressure display close to the injector

CNC-602A: fuel pressure display is a bit far from the

 injector

● **CNC-603A more convenient to detect the injector**

CNC-603A: the transparent tubes for detection are closely

connected

CNC-602A: the transparent tubes for detection are with some

distance from each other

Thanks for your time!

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