

# Automobile Actuator Drive Detector QDB-2A

## Instructions for use



Special equipment for car service technicians

## 1 Main functions:

- (1) Direct drive test 12V-24V gasoline engine and natural gas engine ignition coil.
- (2) Direct drive test 12V-24V gasoline and diesel vehicle injectors (piezo injectors are not supported).
- (3) Directly drive and test various duty cycle-controlled motors, such as electronic throttle motors.
- (4) Directly drive and test various duty cycle control solenoid valves, such as: fuel metering valve, canister solenoid valve, exhaust gas recirculation EGR solenoid valve, etc.
- (5) Drive and test various low-power stepper motors, such as: idle stepper motors, instrument stepper motors, headlight range stepper motors, etc.
- (6) Can simulate the duty cycle type sensor signal, for example: air conditioner pressure sensor signal.

## 2 Parameters:

- (1) Hall (square wave) signal with adjustable output frequency, amplitude and duty cycle.
- (2) Frequency Range : 1HZ-100KHZ
- (3) Signal amplitude range : 1.3V-12V
- (4) Duty cycle range : 1%-100%
- (5) Stepping motor drive pulse, forward and reverse control.
- (6) External power supply: 12V-24V, recommended use **car battery or**

stabilized power supply (requires output current above 5A).

(7) Power supply voltage output socket: the voltage is equal to the external power supply voltage, the output current is 3A, with overcurrent protection (automatic power-off when the current is too large).

(8) Adjustable voltage output socket: voltage 1.3V-12V continuously adjustable, current 1A.

(9) Hall signal output jack: output negative duty cycle Hall (square wave) signal

(10) Electromagnetic coil drive socket: duty cycle control, drive current 3A.

BRIGHTWIN

### 3Panel operation instructions:



**驱动宝 QDB-2A** Automobile actuator drive detector

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## QDB-2A Automobile actuator drive detector

### 4 Instructions for use test ignition coil

There are two types of ignition coils: module type (with power drive module inside) and coil type (without power drive module inside)

\*Module type and coil type ignition coil testing methods are different; user must confirm the ignition coil type before testing it. Otherwise, QDB-2A does not work.

Common COP independent ignition coil terminals are 2-wire, 3-wire, and 4-wire

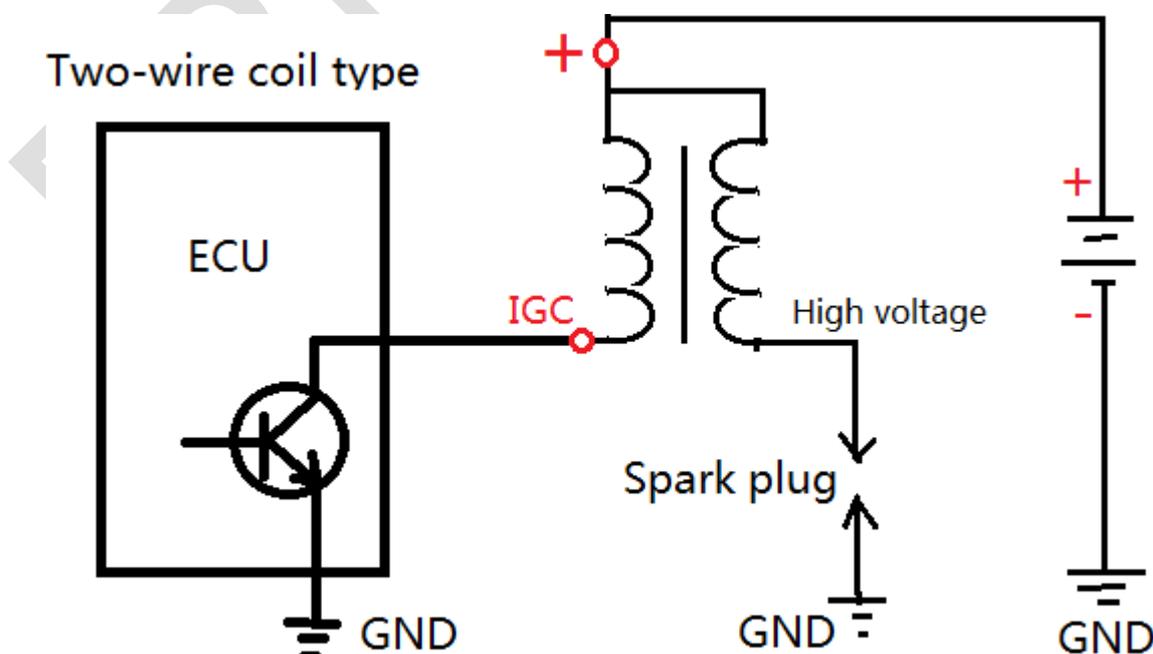
2 wires are coil type, 3 wires have coil type and modular type (use a multimeter to measure the resistance to determine the type), 4 wires are basically modular type.

Coil type ignition coil can be measured with a multimeter. Generally, the resistance value is about  $1\Omega$ . If a 3-wire ignition coil has two terminal resistances of about  $1\Omega$ , the ignition coil is a coil type, otherwise it is a modular type.

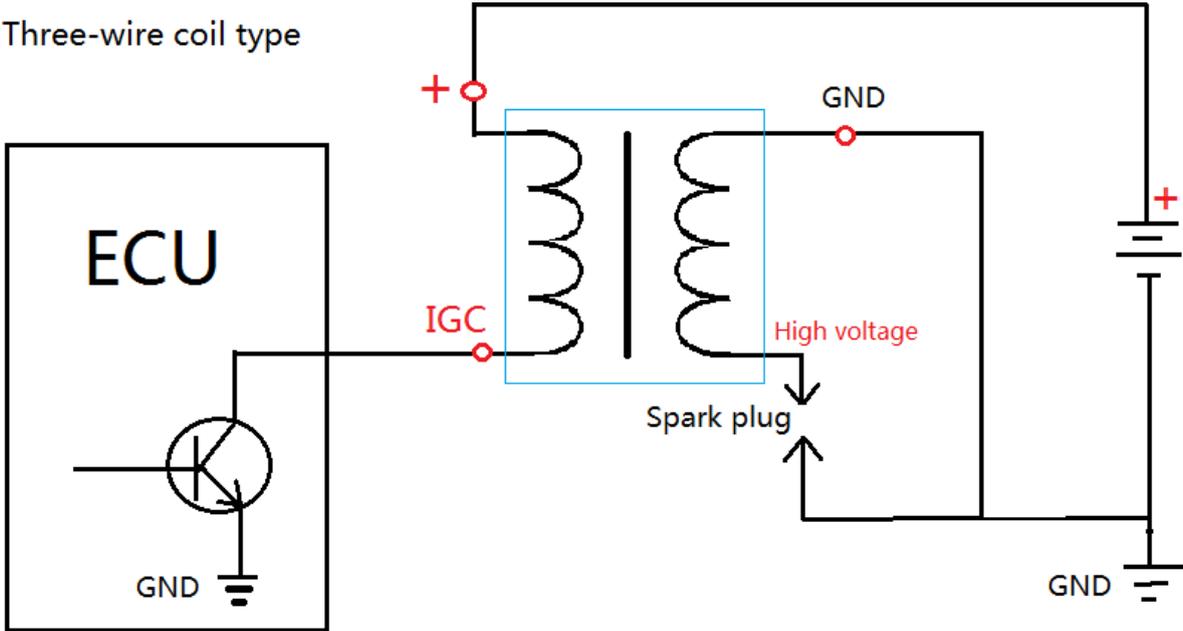
### Pay attention:

The coil type and the module type have different wiring methods on the driver, and the duty cycle is also different.

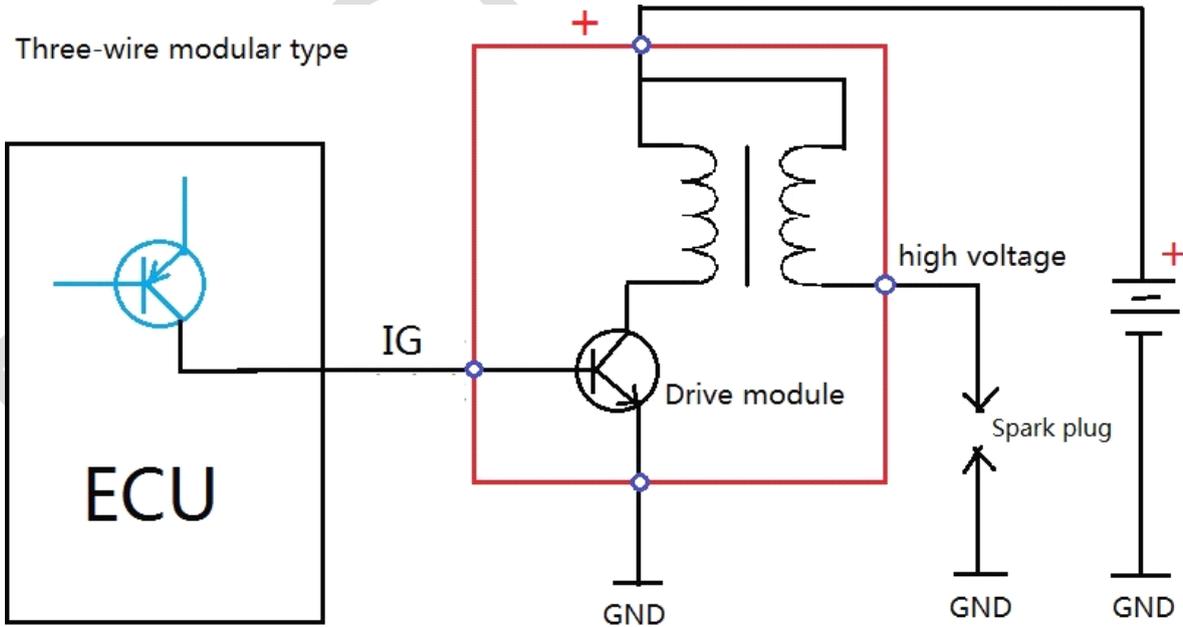
### Ignition coil circuit schematic diagram



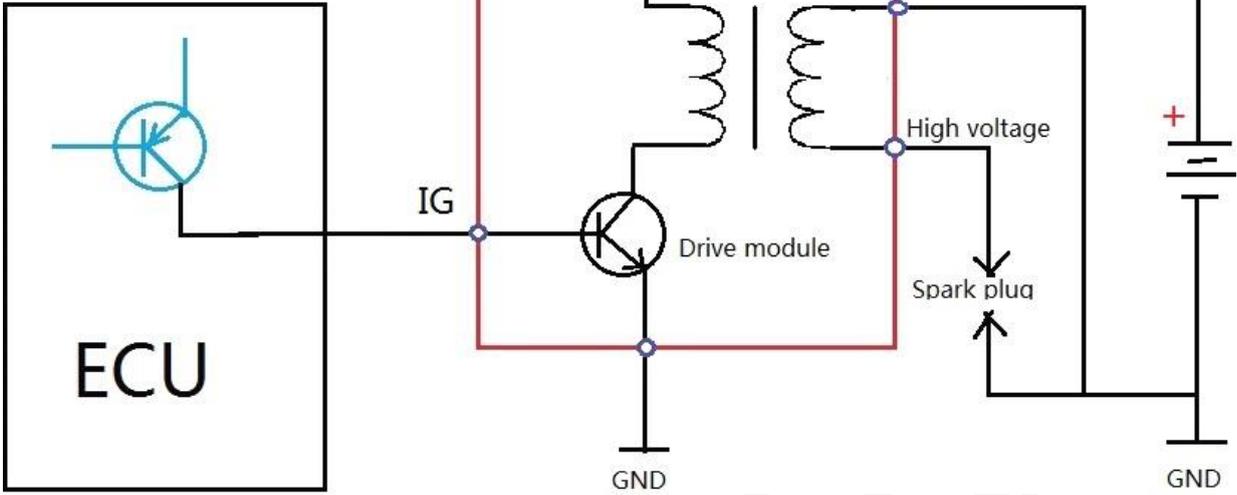
Three-wire coil type



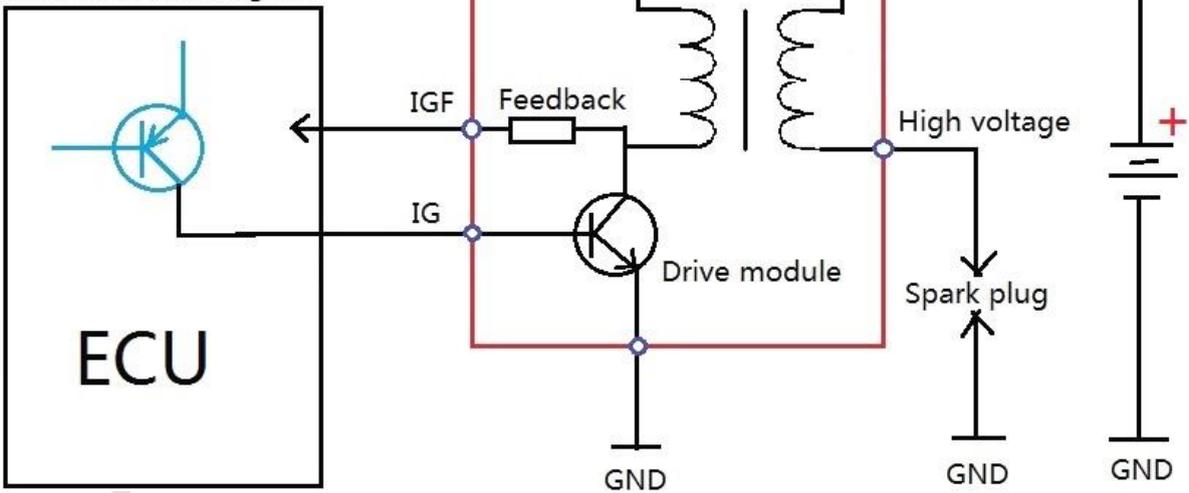
Three-wire modular type



Four-wire module type  
independent ignition



Toyota four-wire modular  
ignition coil  
With feedback signal



## Coil type ignition coil test steps (recommended use battery power supply)

Plug in the external power supply (current must be higher than 5A)

1. Adjust the frequency to 10-40HZ
2. Adjust the duty cycle to 1-5%
3. Put the high-voltage end of the ignition coil (the spark plug terminal) close to the coil GND wire "about 10mm distance away".
4. Connect the positive pole + of the ignition coil to the "power supply voltage output" socket of the QDB
5. Connect the ground wire GND of the ignition coil to the "ground wire GND" socket of the QDB
6. Connect the IGC signal terminal of the ignition coil to the "Electromagnetic Coil Drive" socket of the QDB
7. The ignition coil should flashover normally at this point



### Modular ignition coil test steps (recommended use battery power supply)

1. Plug in the external power supply (current must be higher than 5A)
2. Adjust the frequency to 10-40HZ
3. Adjust the duty cycle to 95-99%
4. The voltmeter shows that the Hall signal amplitude is adjusted to 5-11V  
(some 5V flashover, and some flashover after 10V)
5. Put the high-voltage end of the ignition coil (the spark plug terminal) close to the coil GND wire "about 10mm distance away".
6. Connect the positive pole + of the ignition coil to the "power supply voltage output" socket of the QDB
7. Connect the ground wire GND of the ignition coil to the "ground wire" socket of the QDB
8. Connect the IG signal terminal of the ignition coil to the "Hall signal output" socket of the QDB

The ignition coil should flashover normally at this point





In addition to the above 2-wire, 3-wire, and 4-wire independent ignition coils, there is also a combined ignition coil

The combined ignition coil is to combine 2 or more independent ignition coil packages into a whole, and the ignition coil cannot be disassembled and replaced separately.

Combined ignition coils are also divided into coil type and module type, including 3-wire, 4-wire, 5-wire, 6-wire, etc.

Before the test, use a multimeter to test the resistance to determine which type it is. The test method can refer to independent ignition coils. QDB can drive two independent ignition coils at the same time.

**Test injector:**

At present, there are two types of injectors for internal combustion engines, one is electromagnetic coil type, and the other is piezoelectric crystal type.

Electromagnetic coil injector can be tested with QDB

**Test steps:**

1. Plug the QDB into an external power supply (current >5A)
2. Adjust the frequency to 10-40HZ
3. Adjust the duty cycle to 1-5%
4. The two terminals of the fuel injector are respectively connected to the "power supply voltage output socket" and "electromagnetic coil drive socket" of QDB
5. At this time, the injector should be able to work normally

The piezoelectric crystal injector cannot be tested by QDB due to the high driving voltage



Fuel metering valve, EGR valve, carbon canister solenoid valve, electronic throttle motor, etc., are all controlled by duty cycle to control valve opening

### Test steps:

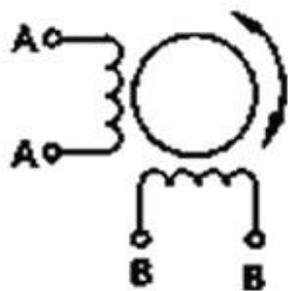
1. Plug the QDB into an external power supply (current>5A)
2. Frequency adjustment range 50-200HZ
3. The duty cycle adjustment range is 1-99%, the larger the duty cycle, the greater the valve opening
4. The two terminals of the solenoid valve or motor are respectively connected to the "power supply voltage output socket" and "solenoid coil drive socket" of QDB
5. At this time, the solenoid valve or motor should be able to work normally



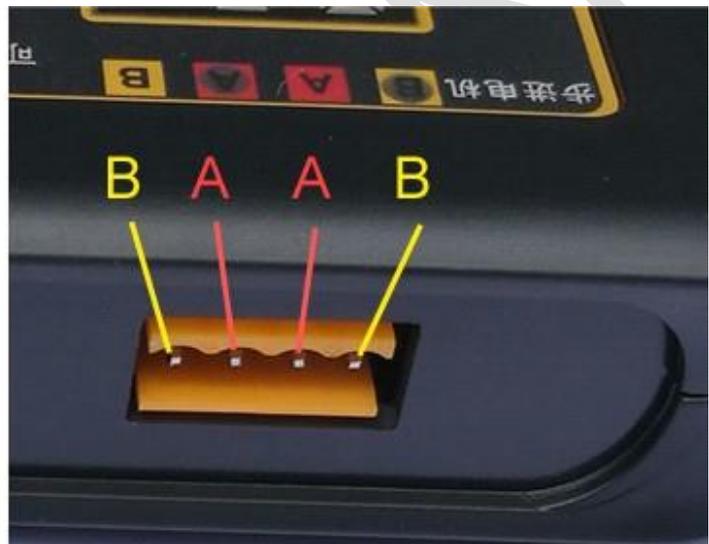
## Stepper motor drive test

There are two sets of coils and 4 terminals inside the stepper motor. One set of coils has both ends A-A, and the other set is B-B.

For example: Idle speed stepper motor, instrument stepper motor, headlight range control stepper motor.



步进电机示意图



### Test steps

1. Plug the QDB into an external power supply (the voltage should not exceed 12V)
2. Use a multimeter to measure the two sets of coils A-A and B-B of the stepper motor
3. Connect according to the logo on QDB, press the stepper motor button, the motor should work normally

## Warnings:

1. Before the test, plug in an external power supply (12-24V) to the QDB. Recommend use a car battery or a stabilized power supply with > 5A current or higher, because the ignition coil, fuel injector, solenoid valve, etc. are all working in a pulse state, instantly high current status.
2. Follow the instructions to adjust the frequency and duty cycle first, and then connect the device under test, the order cannot be reversed
3. If you plug in the power, the instrument will go blank for a moment and the indicator will not light up, indicating that the output current is too large and the instrument is automatically protected. At this time, please plug off the power supply, disconnect all the wiring on the instrument socket, and then plug it in again. Power supply, and adjust the frequency and duty cycle according to the instructions, and then plug in.
4. When the instrument is in use, the LCD screen becomes black, it indicates the current is too large, and the instrument automatically enters the protection state. At this time, please check whether the wiring is correct and the duty cycle adjustment is reasonable.
5. [Adjustable voltage output socket]: its output current is too small, do not connect to ignition coil, fuel injector and other high current devices.
6. If using car battery as power supply, please DO recheck if your car battery has been fully charged or not. If it is NOT fully charged, the voltage may be lower than 12V, it cannot work well with QDB-2A.

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