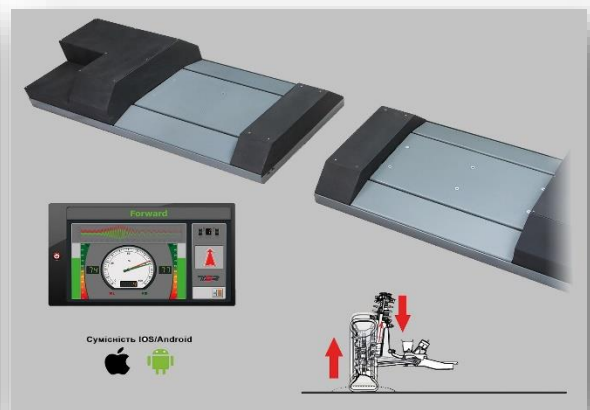# Suspension Testers RST-1600/RST-1500W Series

The most accurate way to determine shock absorbers condition

Designed for vehicle inspection, tune-up shops and automotive mechanic shops.

Main features:

- Fast and accurate shock absorber diagnostics
- EUSAMA is a standard for measuring
- Measuring the minimum value of dynamic support force for each wheel to determine the suspension's effectiveness in traction
- Sensor self-diagnose function ensuring the equipment working rightly

Leading-edge features:
- No concrete work is required, it is installed on the floor
- Low noise levels during testing
- Designed for cars with low clearance starting at 80 mm

Technical Parameters:

Parameter:	RST-1600
Maximum axle load	3 T
Electric motor power	1.5 kWt x 2 Total 3 kWt
Track	880 – 2200 mm
Test frequency	23 Hz
Amplitude	6 mm
Size (L x W x H)	1320 x 630 x 210 mm
Weight	500 kg

# Content

Chapter1 General Information

Suspension tester can test wheel load ,suspension efficient and suspension unbalance. Suspension tester is your best choice of repair shop,car sales center and testing station.

The lowest requirements of the equipment:

| Hardware	01	Computer	Industrial control computer
	02	CPU	PIII 800
	03	Main board	Embedded
	04	Hard	20G
	05	Memory	128M
	06	Monitor	17" LCD
	03	Cabinet	
	04	Printer	Ink-jet Printer
	06	DAQ card	PCL-812PG
	07	Signal integrated board	
	08	Motor control module	
Software	09	Testing software	
	10	Operation system	WINDOWS 2000
	11	Support software	WINRAR 3.0

Chapter2 Installation Guide

2.1 Equipment Connection

or
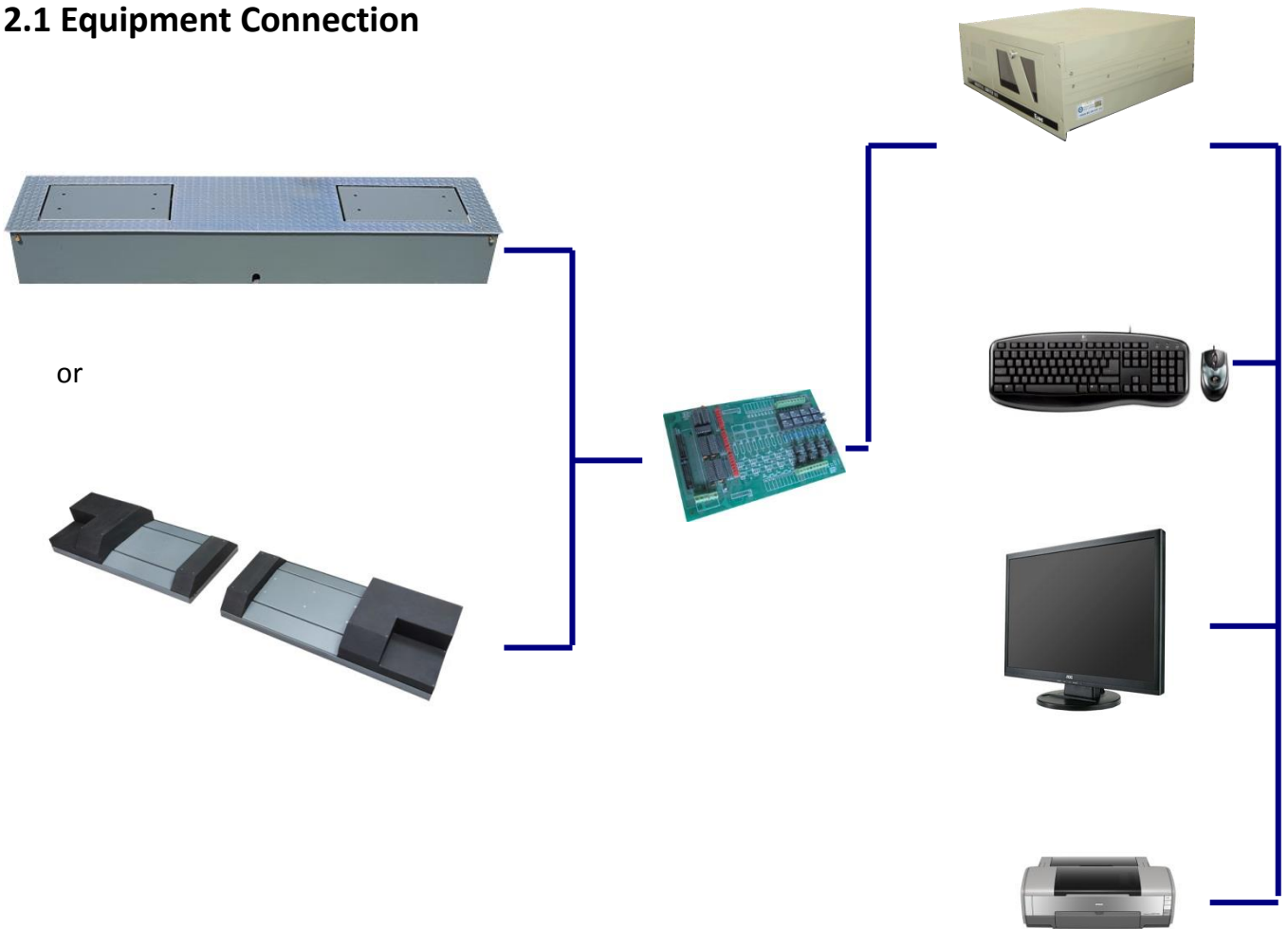
2.2 Fix

1. Using screws to fix the suspension tester.
a) suspension tester
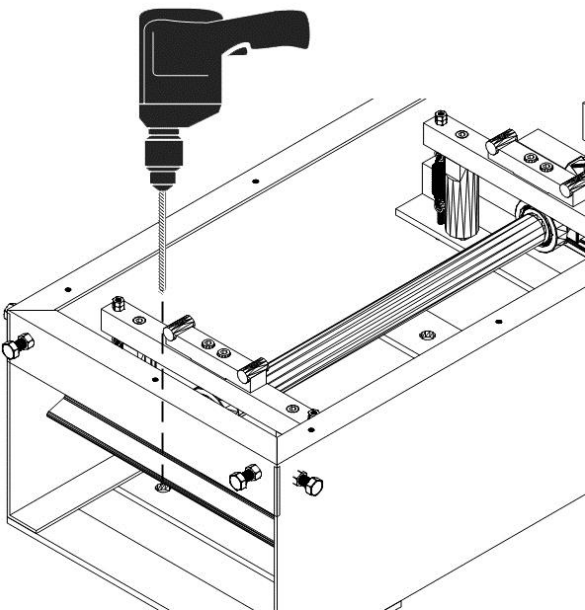
b) Ultra-thin suspension tester

a) Screw the L block to each side of bench as above picture

2. Screw in the suspension bench to the pit frame see following picture. The ultra-thin suspension tester use ramp for drive in and out. Please plug the nuts to the hole as following:

Suspension tester   Ultra-thin suspension tester
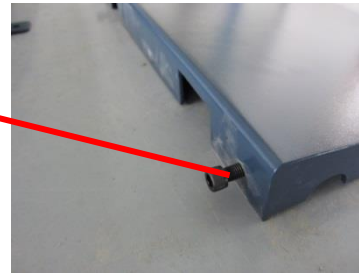
2.3 Wiring

2.3.1 Connect the suspension motor wire and sensor signal cable to the cabinet. Plug the signal cable socket to the wire box and the motor wire to the contactor as following:
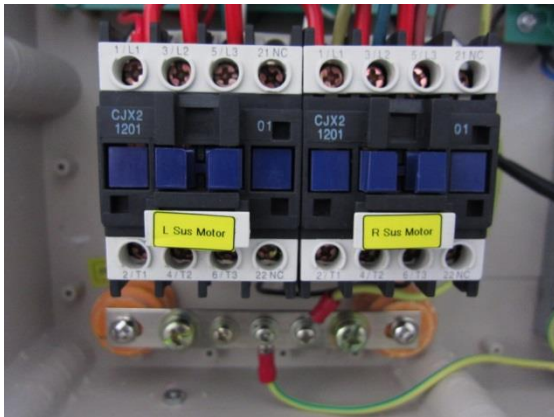
Left suspension motor   Right suspension motor   Left signal   Right signal

2.3.2 Connect the outside power wire to the main terminal block. Pay attention to the neutral wire connection and connect the earth wire to the earth terminal.

Transfer switch

Transfer switch 1,3,5 connect to three-phase power wire and 7 to neutral wire as well as earth wire connect to the earth terminal.Turn the switch to ON and make sure the voltage between phases is 380V and every phase between the neutral wire is 220V.

2.3.3 Close the power box then begin the wire connection of the control system. See the following pictures

Mother board	monitor	Key board, mouse
Input/ output value	Analog value	Printer signal cable

2.3.4 Connect all the plug of the monitor,computer,power,printer to the cabinet power supply socket. Press the bottom and turn on the power supply switch (red means connectted).
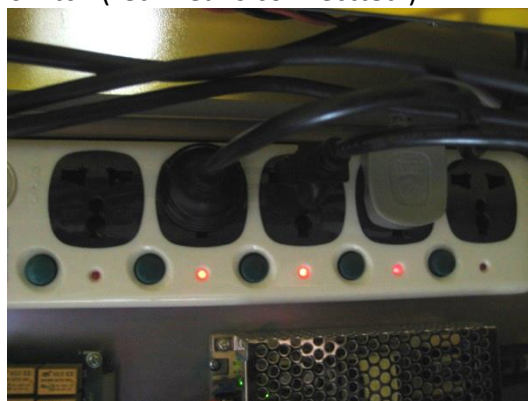
2.4   Software Installation Guide

1、 Please install WINDOWS 2000 or XP operation system

2、 Please install WINRAR 3.0 application software

3、 Please install printer drive

4、 Please install the executive software

Chapter3 Operation Instruction

All the machines should be operated by authorized trained personnel.

The customer should establish regulations and put it in the visible place. Giving the operator proper indication if the irregular behavior happened.

Prior to starting the machine, the user must ascertain the knowledge level of the operators, especially the following:

--- Knowledge of the operating instructions contents

--- Knowledge of the safety and operating rules

--- Knowledge of accident prevention

Only well trained and educated operators should be employed. The work of the operators and maintenance personnel should be clearly defined.

3.1 Safety Rules for Usage

➢ All works on the machine electrical equipment must be carried out by skilled electricians only. People under drugs, alcohol or medicine effects which may jeopardize their quickness of reflex must not be allowed to operate the machine or perform any repairs/maintenance works.

➢ All the safety and accident prevention regulation should be obeyed strictly during or after start-up. Failure in keeping to them can result in people injuries. The machine must be stopped or not started as any defects affect the machine safety or performance.

➢ It is forbidden to cut off, change and irregular use of the safety devices. Taken necessary measurement to ensure the machine operating under safety conditions. The machine must be operated only when all the safety and protection devices are in place (i.e. emergency protection measurement). It is forbidden to change and modify the system. To ensure the safety of modification, the user has a responsibility for the damage due to modification. If have any questions please contact Jevol Technical Department for applying authorized before modification.

➢ Turn off the bench immediately if the operation is abnormal and eliminate the abnormal phenomena.Press emergency button when the condition is dangerous or the spare were defected. The operator restarts the equipment after eliminating the trouble and the system in the safety condition.

➢ The bench must be immediately switched off in case of:

--- Defect of the electrical equipment, lines and the insulating devices;

--- Operation failure of brake or safety devices;

--- Breakage of tested vehicle

➢ Unexpected sequence will be happened if use the equipment in the specific condition. So the user has a responsibility for the safety operation. Stop the equipment until the condition is safe

if necessary.
- ➢ Make sure all the staff is safe before starting. If someone is in danger stop the equipment immediately and restart the machine when all the staff in the safe condition.
- ➢ Prior to switch on the bench, the operator must ascertain that the working conditions are correct and perfectly safe. If the operator notices someone who may be endangered, he must immediately stop it; the system must be started again only when the people are beyond the danger area.

3.2 Safety Rules for Maintenance and Repairs

All the adjustment, maintenance and inspection should be obeyed according to the manual. All the mechanical and electrical repairs must be carried out by qualified personnel only. The unauthorized staff was forbidden to carry out any kind of work on the equipment.

Prior to proceeding to maintenance and repairs, the machine must be temporarily switched off to prevent unauthorized personnel unintentional start the equipment.

Before working on the electrical devices and systems, make sure that the bench is not energized. The following must be assured:

--- The main power supply must be cut off;

--- The movable parts must be at a standstill;

--- The movable parts must be unable to get into motion during maintenance operations;

--- It is forbidden to start the power supply during maintenance or repairs.

In disposing the waste materials and the replaced components, strictly follow the environment protection rules.

3.3 Rules for Works on Electrical Component

According to the electronic rules, all works on electrical parts or components shall be carried out by qualified technicians only, or by specifically trained operators under the direction or the supervision of a skilled electrician. Before proceeding to inspection, maintenance and repairs on the machine parts, the power supply must be cut off.

The machine electrical equipment must be inspected / checked at intervals time. Defective parts, such as loose connections of power line or signal cables, must be immediately removed. Switch off the power supply before removing or connecting the plug (only a network connection has no danger at anytime according to the safety rules). Use original fuses only, with the prescribed current carrying capacity (in Ampere)! In case of defects in the power supply, the machine must immediately be disconnected. Replace with new fuse of the same type if the defective fuses can not be repaired

The operator should have an assistant in case of danger. If dangerous conditions happened the assistant can press the emergency button or turn off the main power supply.

3.4 Testing Program

3.4.1 Start Software

1. Double click ▮▮▮ the software start

2. If choose "self-inspection" in SETUP, the software will check all the sensors then go to the main interface after all sensors are right. If any sensor has problem following error code will appear

Error Code 011:

    Brake tester left brake force sensor zero problem, causes:
    a)   Left brake force sensor wire disconnected, please check wire connection
    b)   No power
    c)   If still has problem please contact us

Error Code 012:

    Brake tester left brake force sensor amplifier problem, causes:
    a)   Max brake force parameter too large, please modify the max brake force in SETUP to the following:

        3T brake tester：6000N   10T brake tester：30000N

    b)   Sensor zero point high, please refer to *sensor adjustment*   to adjust the sensor zero point to 200
    c)   Need to recalibrate

Error Code 013

    Brake tester left brake force value jump, causes:
    a)   Sensor wires disconnected, please check sensor wires
    b)   Channel setup wrong, please refer to *Channel Setup* to change the left brake force sensor channel
    c)   Equipment didn't connect to earth wire

Error Code 014

Right brake force sensor zero point error, please refer to ERROR CODE 11 (Left brake force sensor zero problem) to adjust

Error Code 015

Right brake force sensor amplifier problems, please refer to ERROR CODE 012 to adjust

Error Code 016

Right brake force sensor value jump please refer to ERROR CODE 013 to adjust

Error Code 017

Left load sensor zero point error please refer to ERROR CODE 011 to adjust

Error Code 018

Left load sensor amplifier error please refer to ERROR CODE 12 to adjust

Error Code 019

Left load sensor value jump please refer to ERROR CODE 013 to adjust

Error Code 020

Right load sensor zero point error please refer to ERROR CODE 011 to adjust

Error Code 021

Right load sensor amplifier error please refer to ERROR CODE 12 to adjust

Error Code 022

Right load sensor jump please refer to ERROR CODE 013 to adjust

Error Code 023

Sideslip sensor zero error please refer to left brake force sensor zero error (Error Code 011) to adjust

Error Code 024

Sideslip sensor value jump please refer to left brake force sensor jump (ERROR CODE 013) to adjust

Error Code 025:

Brake tester left right limitation switch pressed, causes
a) Vehicle on the bench ； please drive vehicle out of bench and restart the software
b) The switch sensor distance too long please refer to *Installation Guide* to adjust the switch distance

Error Code 026

Remote control error
a) Check the "remote control " in SETUP but actually no remote control
b) Remote control channel setup wrong, please refer to *Channel Setup* to change the channel
c) Remote control wire connection wrong, please check the wire connection

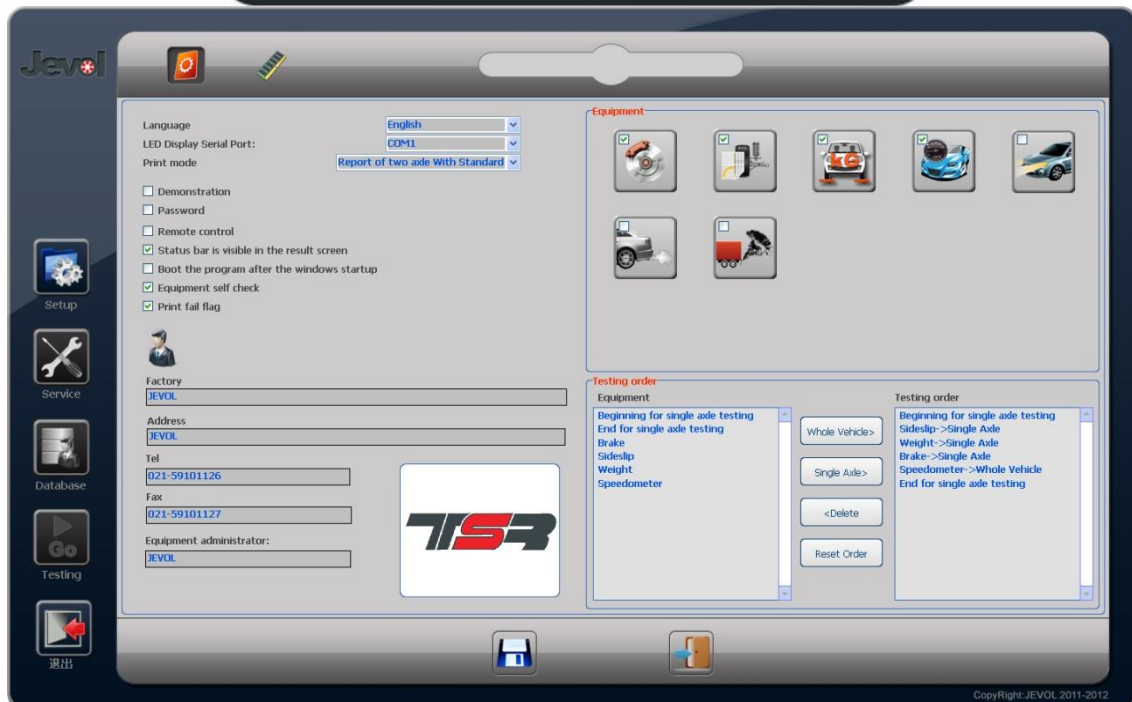## 3.4.2 Main Interface

SETUP

SERVICE

DATABASE

TESTING

EXIT

3.4.3 Setup

The software authorized person can use only please contact us about the User name and password. **PLEASE DONOT CHANGE SETUP.**

Usual Setup

Separate Item Setup

3.4.3.1 Usual Setup

1. Language
    Choose the language if need to add language please contact JEVOL for details.

2. LED display serial port
    The LED can display the testing steps clearly in long distance to guide the operator to follow the steps. LED is optional.
    If has LED please choose the display com port
    If haven't LED please change the display port to "None"

3. Print mode
    There are 4 formats print reports, select "Suspension".

4. Demonstration

    After check, the software can display the demonstration for knowing testing steps. Please restart the software after check Demo.

    The headlight tester, smoke meter and gas analyzer use the communication port and cannot DEMO. If need demo please add virtual port details refer to *Virtual Port.*

    If SETUP port is not right the software will display error.

5. Remote Control

    Please do not check if without remote control otherwise the self-inspection will display error . The remote control is optional.

6. Status is visible in the result screen

    The PASS or FAIL will display

    If didn't check no judge for status

7. Boot the program after the windows startup

    Check it the testing software will automatic run after turn on the computer.

8. Equipment self-check

    The software will self-check after running.

9. Print result flag
   The testing result will be judged by PASS or FAIL.

JEVOL Electromechanical

Date	2013-01-17 12:36:25	NO.	JEVOL-00000262
Company			
Address			
Tel		Fax	
Name	1258	Car type	
Operator	2589	Plate Number	2589
VIN/Chassis NO.		Mileage	kM

PASS

JEVOL Electromechanical

Date	2013-01-17 12:36:25	NO.	JEVOL-00000262
Company			
Address			
Tel		Fax	
Name	1258	Car type	
Operator	2589	Plate Number	2589
VIN/Chassis NO.		Mileage	kM

10. Testing station information
    The testing station will display on the result.

Factory
JEVOL Electromechanical

Address
Buliding 18, No.688 Jiaqian Road,Jiading District,Shanghai,China

Tel
021-69890798

Fax
021-69890790

Equipment administrator:
Daive Wang

TSR

|	Address	Buliding 18, No.688 Jiaqian Road,Jiading District,Shanghai,China	
TSR	Tel	021-69890798	Fax 021-69890790

For change the logo, please rename the logo picture to "Logo.jpg"and copy to C/PROGRAM FILE/ TSR SERIES/PHOTO . Then restart the software the new logo will be display. The picture should be JPG and no more than 50K.

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3.4.4 Service

The software authorized person can use only please contact us about the User name and password. The software already Calibrate before sending please do not change it without permission.
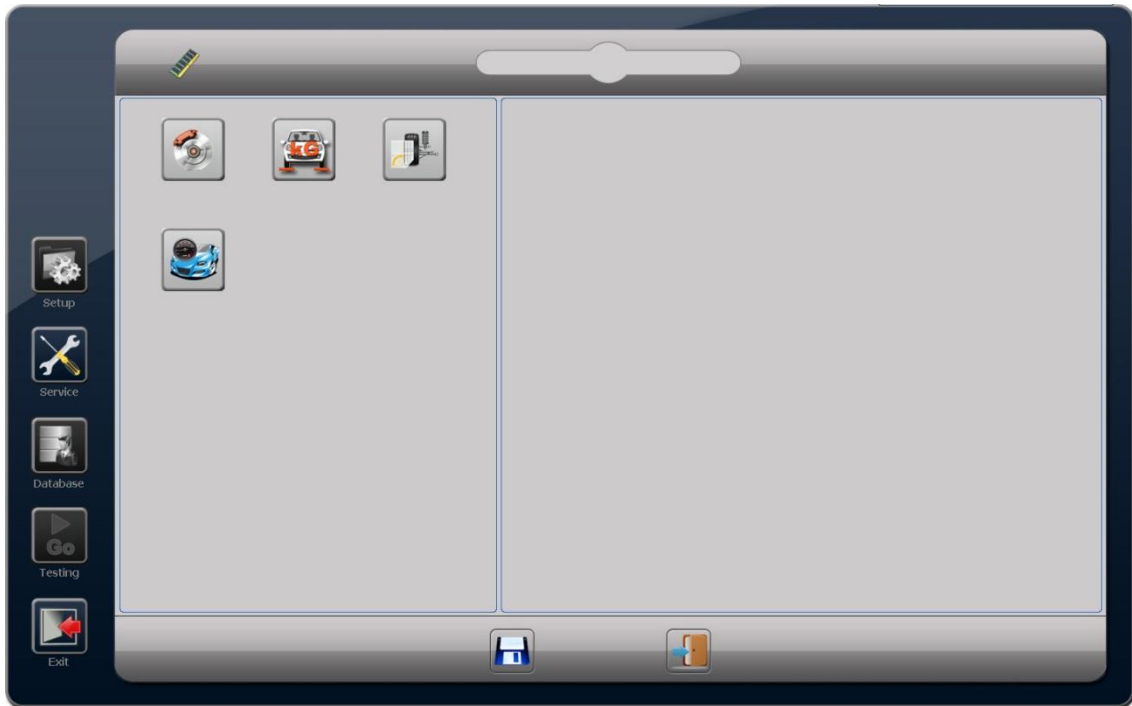
The equipment calibration and maintenance in SERVICE
CALIBRATEION UNDER AUTHORISED PERSON ONLY

3.4.4.1 Suspension Tester
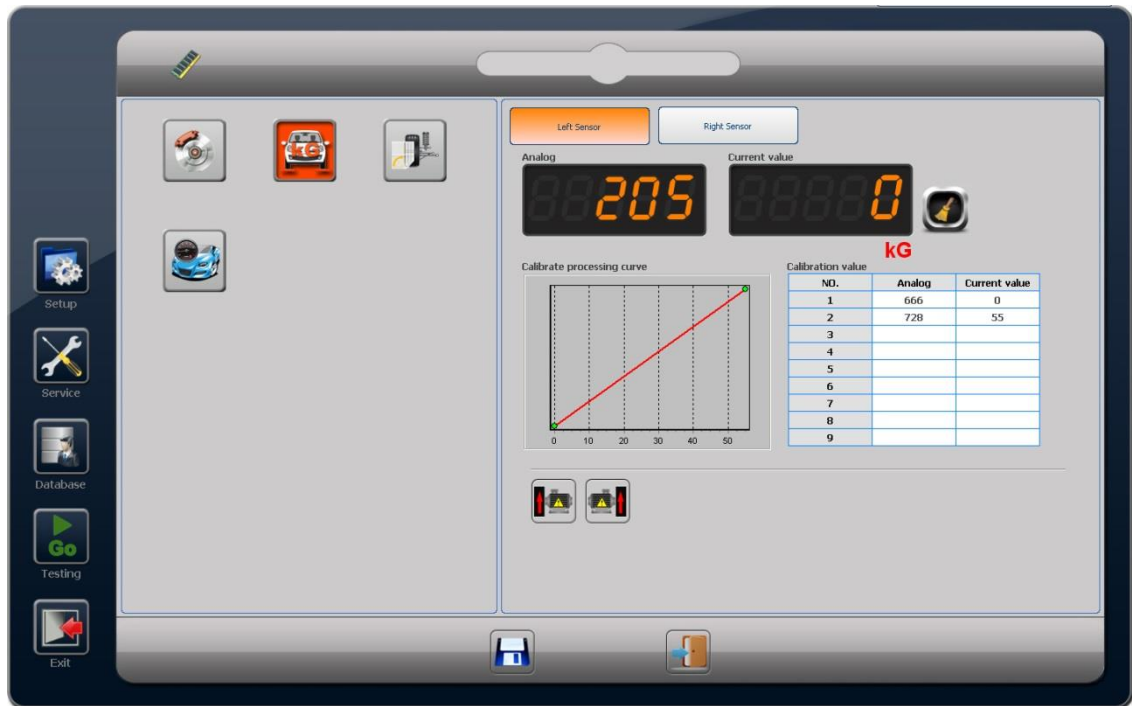
The interface is wheel load the left, right sensor can be choose, if axle load only left sensor can be choose

3.4.4.2 Calibration

Please refer to brake tester calibration

a) Choose sensor

b) Zero

c) Input calibration value

1. **Input the analog value which (no weight/load/poise) current value is 0 in number 1**
2. **Load poise and write down the analog value in the number 2, current value is the load poise value (NOTE: the calibration arm times)**
3. **Follow the steps to add different poise and write down the current value and analog value.**
4. **The software can load 9 different weight, the more calibrate the testing result more accurate**
5. **After finish please save**

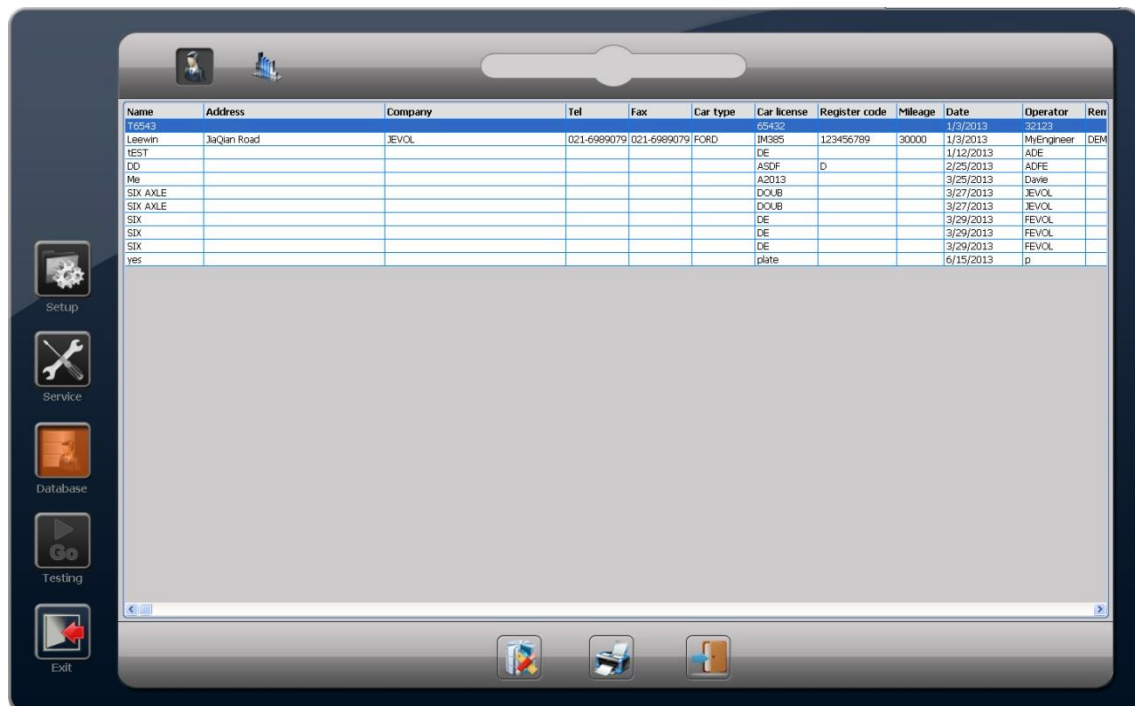d) Linear Graph please refer to brake tester

3.4.4.3 Output Control

If choose the suspension test in SETUP, in the output control can check if suspension motor all right.

NOTES: The suspension tester cannot running for long time without load. The suspension tester frequency is 23HZ if long time running will damage the components.

3.4.5 Database

| Name	Address	Company	Tel	Fax	Car type	Car license	Register code	Mileage	Date	Operator	Rem
T6543						65432			1/3/2013	32123	
Leewin	JiaQian Road	JEVOL	021-6989079	021-6989079	FORD	IM385	123456789	30000	1/3/2013	MyEngineer	DEM
tEST						DE			1/12/2013	ADE	
DD						ASDF	D		2/25/2013	ADFE	
Me						A2013			3/25/2013	Davie	
SIX AXLE						DOUB			3/27/2013	JEVOL	
SIX AXLE						DOUB			3/27/2013	JEVOL	
SIX						DE			3/29/2013	FEVOL	
SIX						DE			3/29/2013	FEVOL	
SIX						DE			3/29/2013	FEVOL	
yes						plate			6/15/2013	p	

1. lick to check the detail data.

	Left	Diff(%)	Right
Brake force(N)	4121	4	3946
Friction(N)	0		0
Hand brake(N)			
Friction efficiency(%)	0		0
Brake efficiency(%)		85	
Hand brake efficiency(%)			
Pedal force(N)			
Brake finished time(s)			

Total brake efficiency(%)

82 %

Total Hand brake efficiency(%)

31 %

- Left Brake
- Right Brake
- Left hand brake force
- Right hand brake force

Status **PASS**

2. It can print the result or switch to the database main interface check other clients result.

3.4.5.1 Database Operation

Click to database operation
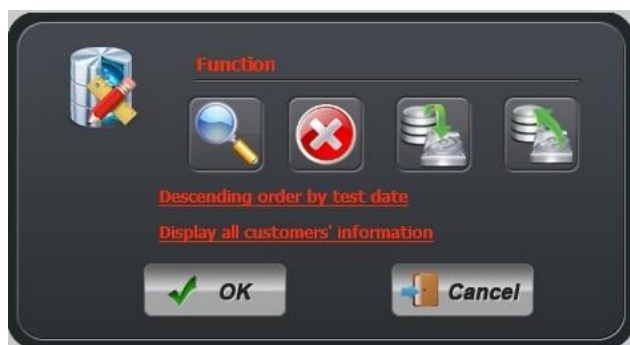
3.4.5.2 Search

It can search result by vehicle name, car plate number, date

16

3.4.5.3 Delete

Delete the chosen record or clean or the record.

3.4.5.4 Backup
Backup the database
After backup all the data will be deleted.

3.4.5.5 Recovery
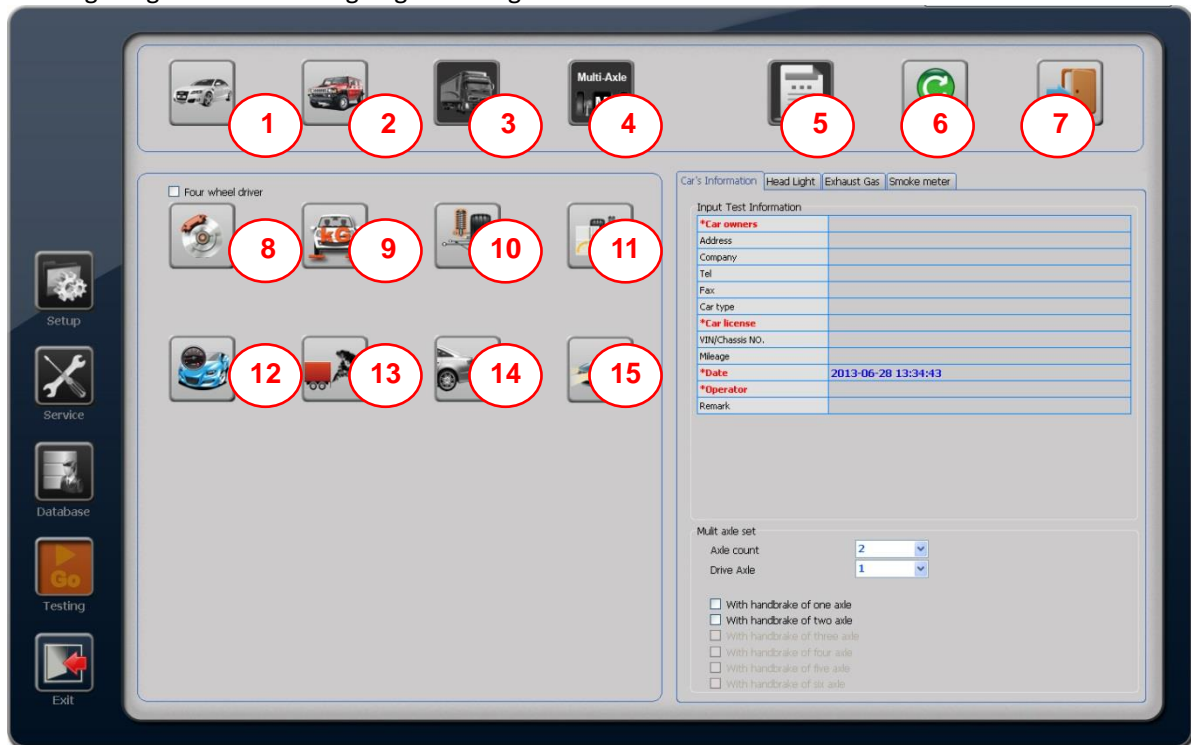All of the current record will be replace.

3.4.5.6 Order by date
The testing record will be order by testing date.

3.4.5.7 Display the clients information
Click this to display the clients' information

3.4.6 Testing

Click the testing image then software going to testing

1 –2W car testing (auto test for the chose equipment)
2 –4W car testing (auto test for the chose equipment)
3 –Truck testing (auto test for the chose equipment)
4 –Customized multi-axle testing (auto test for the chose equipment)
5 –Testing result
6 –Retest
7 –Exit
8 –Brake test only
9 –Weight/load test only
10 –Suspension test only
11 –Sideslip test only
12 –Speedometer test only
13 –Smoke/Opacimeter test only
14 –Gas test only
15 –Headlight test only

NOTES:

The Testing Result button could be selectable only when your testing data are effective.

If you close any equipment in Setup, same equipment in Separate Testing will be un-selectable.

The auto testing order will be followed by SETUP

Input the vehicle information before or after testing. For the headlight tester, gas analyzer and smoke meter need to choose the parameters before testing.

3.4.7 Testing interface
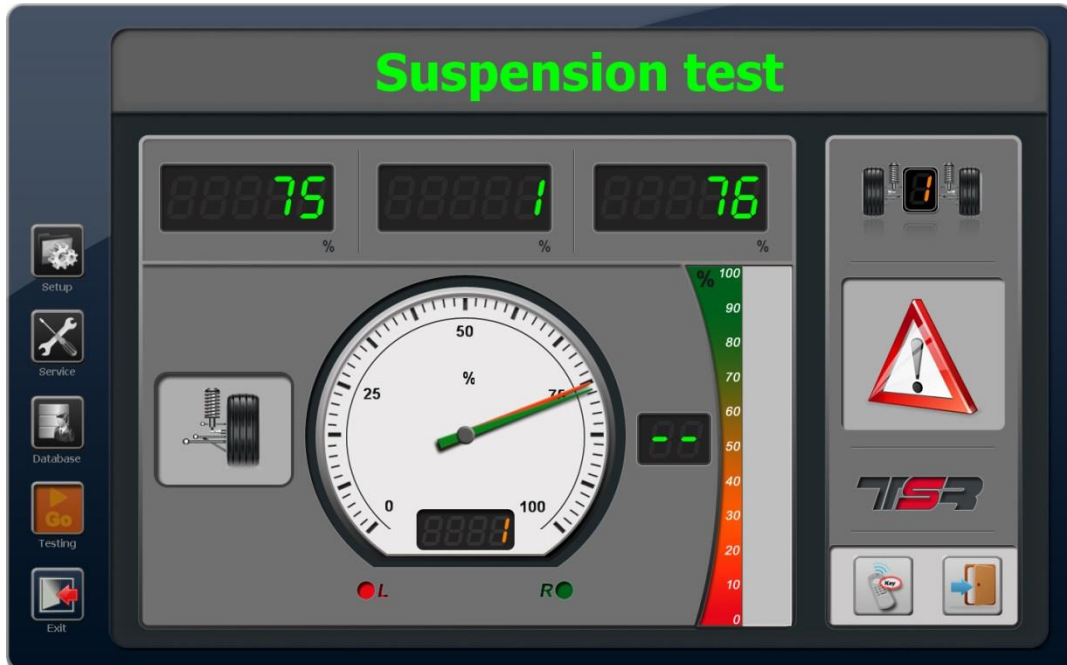
3.4.7.1 Load/Weight Test

Drive vehicle on the suspension tester the equipment begin to test weight:

The vehicle is not on the bench

3.4.7.2 Suspension Test

1. Load first then go to suspension test
2. Test left suspension then right suspension, during the testing the vibration plate will move up and down
3. Forbidden drive vehicle out of suspension bench during testing.

3.4.8 Testing Result

After finish all the testing, the software will back to the following interface, please click the result button to check

the result.
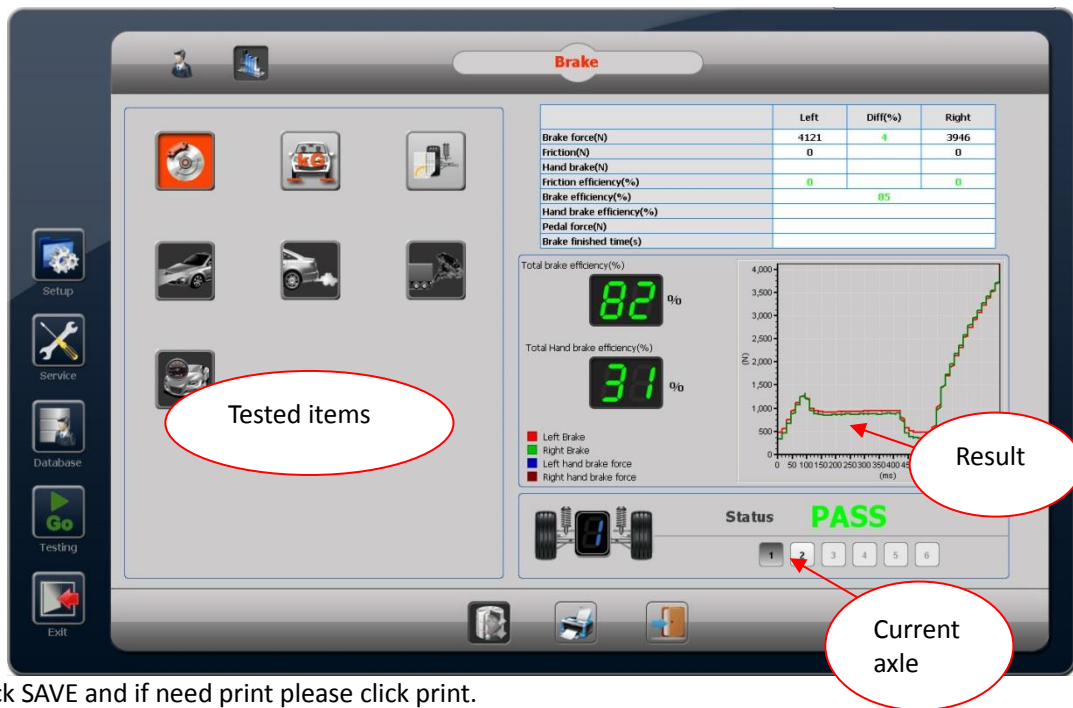
Please click SAVE and if need print please click print.

3.4.9 Print Report

The software will print the report according to 4.1.3 SETUP