

# X-631 Wheel Aligner Maintenance Manual



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## Preface

### Target Reader

- This maintenance manual is suitable for the following people: the first, the people who has some basic knowledge on wheel alignment or people who has some automobile service and maintenance experience and is specializing in the work of automobile maintenance; the second, people who is familiar to the wheel aligner products of Launch Tech Co., Ltd. and has wealthy maintenance experience.

### Purpose

- The purpose to compile this manual is to serve the after-sales technical personnel of Launch Tech Co., Ltd., especially for the technical personnel who have contacted the wheel aligner products for no long time, this manual provides the corresponding knowledge on wheel alignment and technical support to them.
- The main content of this manual is to introduce the wheel aligner of model X-631. In this manual, author describes the wheel aligner by using a lot of practical pictures and explication to avoid unnecessary misunderstanding caused by over-many special items. At the same time, the manual provides the detailed specifications of each key device for servicing personnel looking up. Thus, the after-sales service personnel can rapidly grasp the wheel alignment products of Launch Tech Co., Ltd.

### Required Knowledge

- In order to understand and grasp the content of this manual more rapidly, the related personnel should have the following basic knowledge:
  - ◇ Basic computer knowledge (including the aspects of hardware and software), can assemble and operate computer skillfully.
  - ◇ Basically trained on wheel alignment measurement, having the basic knowledge on wheel alignment.
  - ◇ Having the basic knowledge on electrical/electronic technology, can do it by him-self.

### Summary Table of Maintenance and Testing Items

Client		Manufacturer	Launch
Service No.		Main unit serial No.	
<b>Maintenance and testing for cabinet assembly</b>			
1	Visual inspection for cabinet		
2	Cabinet wiring inspection		
3	Power supply inspection		
4	Power supply switch inspection		
5	Charging socket inspection		
6	Switch power supply inspection		
7	Power strip inspection		
8	Computer inspection and cleaning		
9	Mouse and keyboard inspection and cleaning		
10	Computer system inspection and disk maintenance		
11	RF emitter/receiver box inspection		
12	Antenna and RF cable inspection		
13	Printer inspection		
<b>Maintenance and testing for measurement probe rod</b>			
14	Visual inspection and cleaning for probe rod		
15	Level bubble inspection		
16	LCD display screen inspection		
17	Battery Inspection		
18	Wheel clamp axle inspection		
19	Acrylic panel and key-press board inspection		
20	Aluminum frame inspection		
21	Testing for wireless communication function		
<b>Maintenance and testing for some components</b>			
22	Mechanical turntable inspection		
23	Wheel clamp inspection		
24	Brake pedal depressor inspection		
25	Steering wheel holder inspection		
26			
<b>Result Adjustment: √ OK    Δ Handle at site    R Return to Factory</b>			

## Maintenance and Testing for Cabinet Assembly

### Item1: Visual Inspection for Cabinet

- Check cabinet portiere and door for damage and well movement, and check its surface for serious scratch, etc.

<p><b>Cabinet door inspection</b>—Check the cabinet door for distortion and for smooth opening and shutting.</p>	
<p><b>Surface inspection</b>—Check the surface for bad conditions, such as distortion, paint removing and rust, etc.</p>	

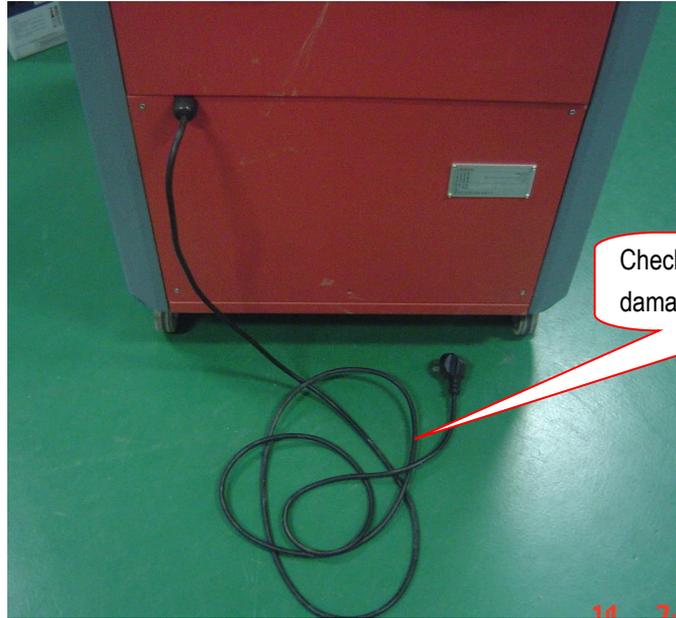
## Item2: Cabinet Wiring Inspection



Check if the wiring inside the cabinet is abnormal:

- Check if it is removed by others;
- Check if the connection screw is loose;
- Check if the cable cover is damaged.

### Item3: Power Cable Inspection



Check power supply cable for damage and plug for distortion

### Item4: Power Supply Switch Inspection

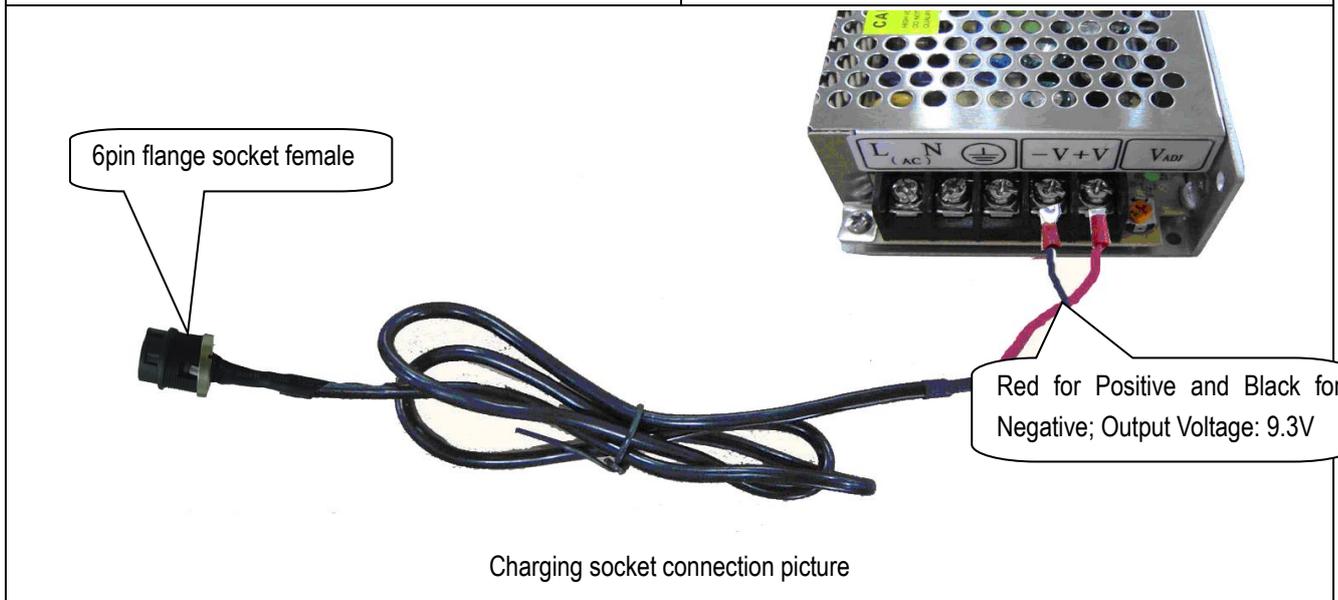
<p>Front side</p>	<p>Connection on back side</p>
<p><b>Note:</b> 1. Check if ship-shape switch switches flexibly and the power supply indicator is lit; 2. Check if the connection on the back side is fastened.</p>	

### Item5: Charging Socket Inspection



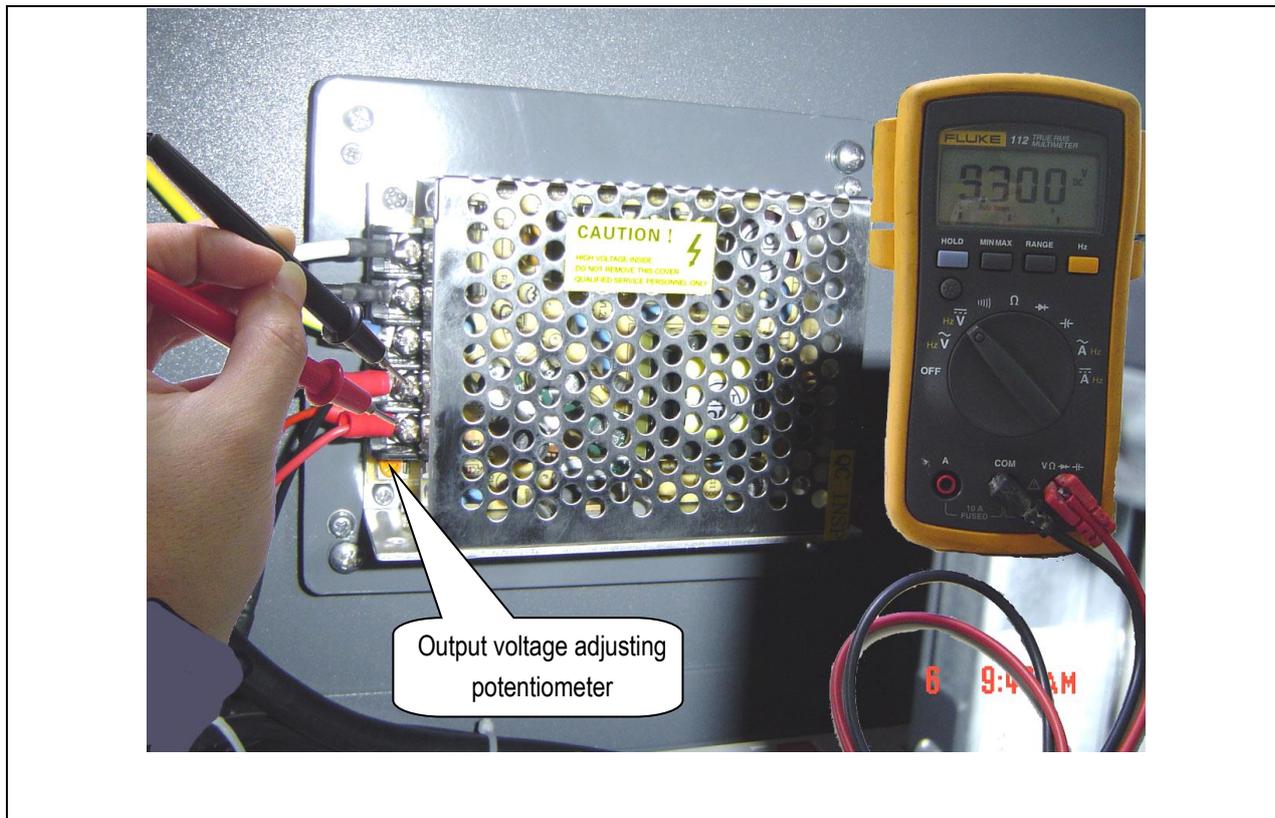
Front side — Check if 6pin flange plug plugs and pulls flexibly

Back side — Check if the cable is broken



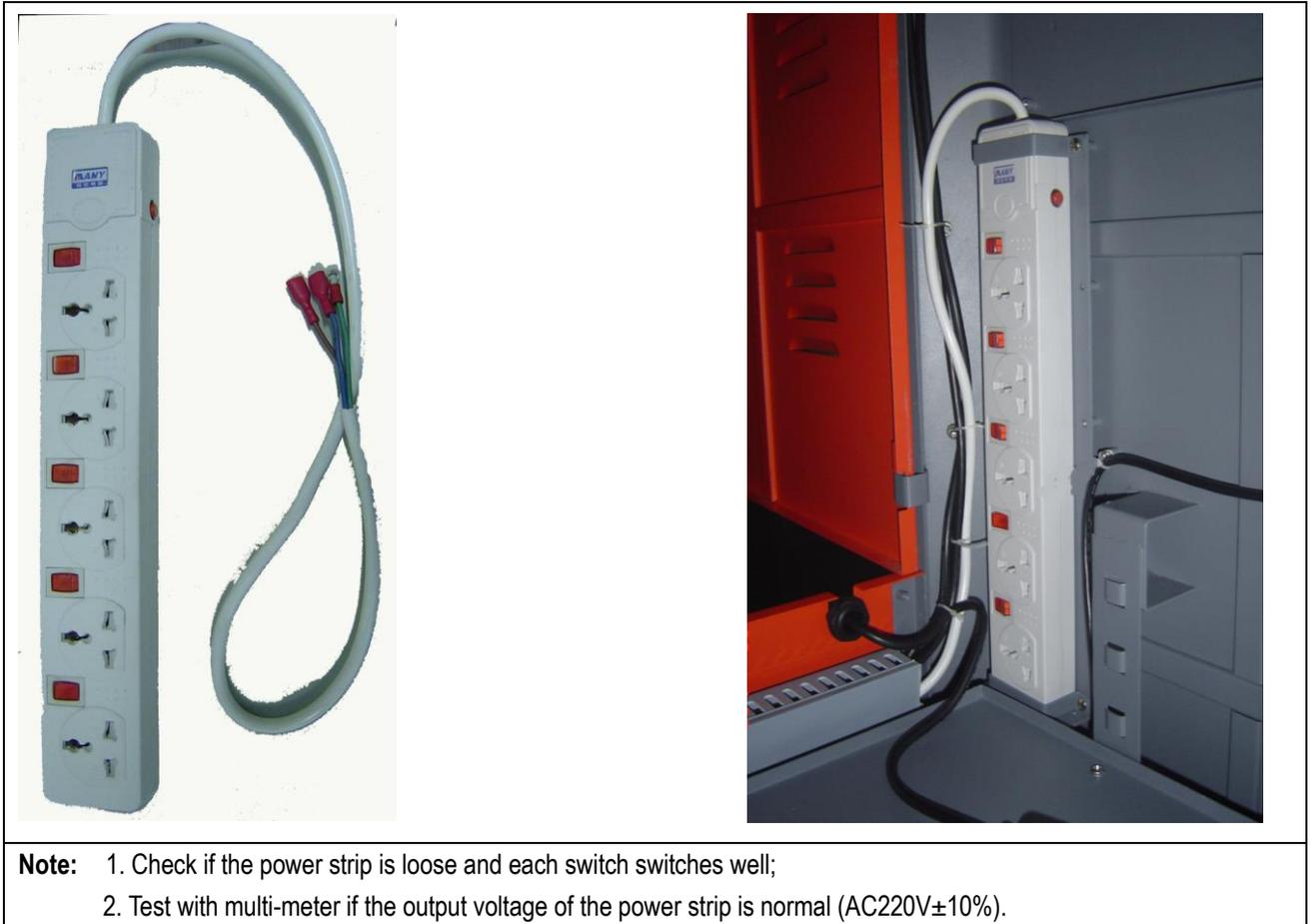
Charging socket connection picture

### Item6: Switch Power Supply Inspection



- Note:**
1. Check if the power supply switch is loose;
  2. Test with multi-meter if the output voltage of the switch power supply is  $9.3 \pm 0.1V$ . If the deviation of output voltage is too large, please adjust the small potentiometer beneath the switch power supply to correct it.

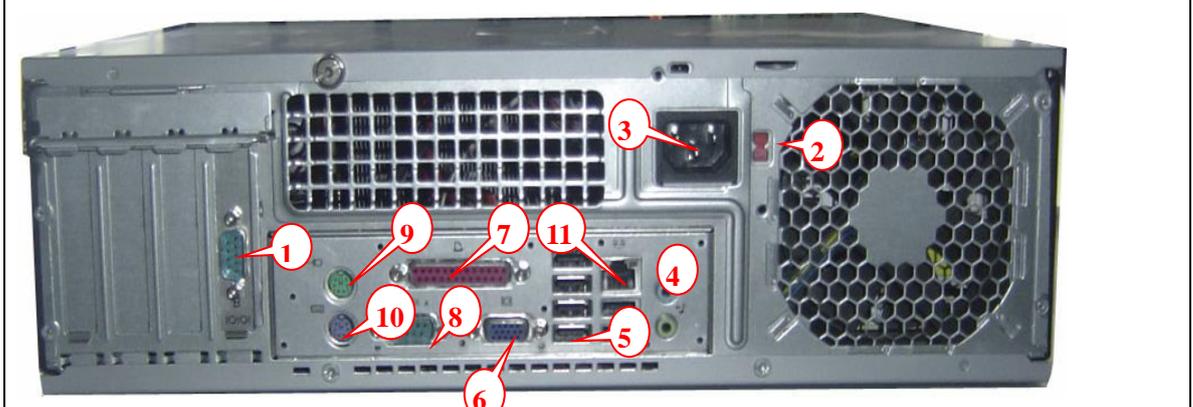
## Item7: Power Strip Inspection



### Item8: Computer Inspection and Cleaning



**Note:** 1. Open the chassis, clear away the dust inside the switch power supply and on the main-board with wind gun;  
2. Check if each connector and memory bank is loose.



1	Serial port 2	7	Parallel socket
2	Voltage switching shift (110V/220V)	8	Serial port 1
3	Power socket	9	Mouse socket
4	Sound box socket	10	Keyboard socket
5	USB Socket	11	NIC Socket
6	Monitor data socket		

**Note:** 1. Pull each connector, check carefully if the pins are in good condition;  
2. Clear away the dust inside the sockets and plugs.

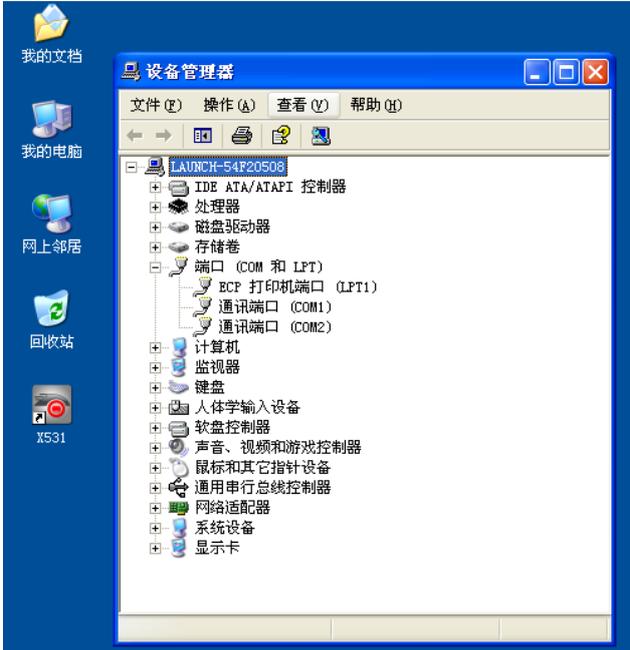
### Item9: Mouse and Keyboard Inspection and Cleaning



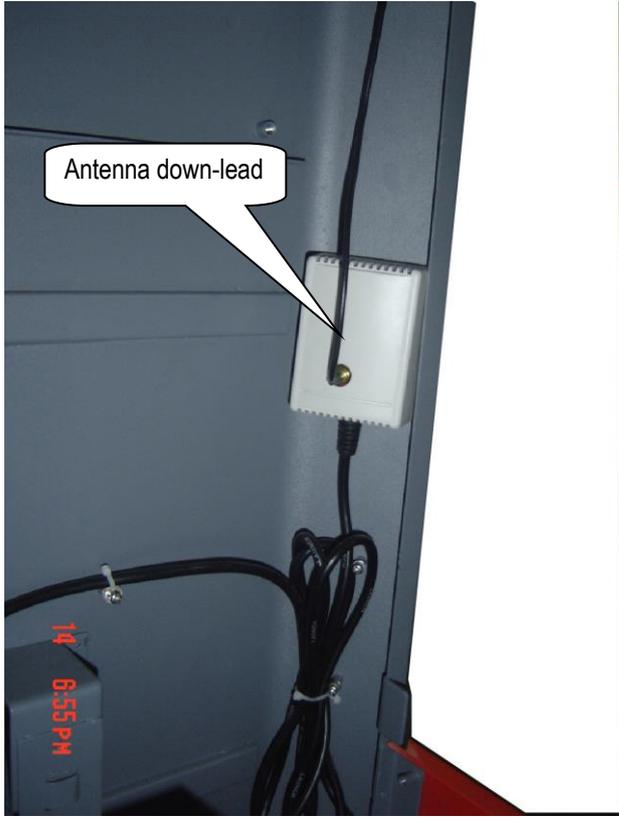
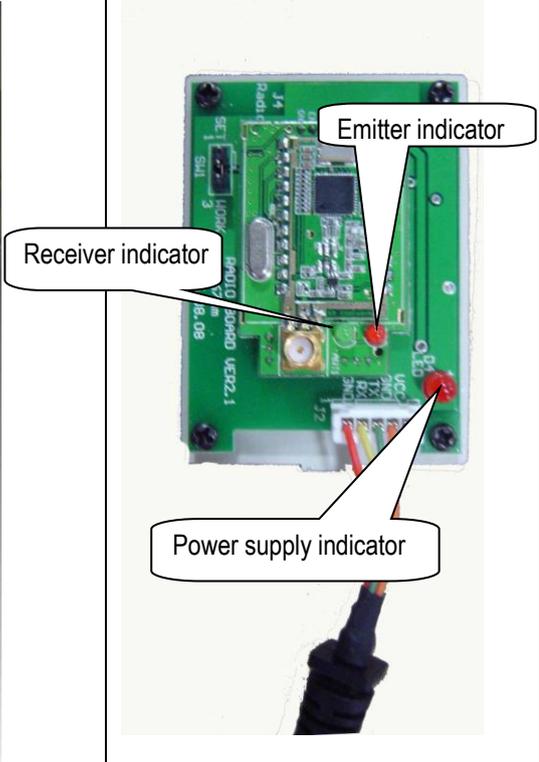
**Note:** Clear away the dust and dirt on the keyboard and mouse;  
Check if there is dirt on the emitter/receiver of photoelectric mouse. If there is, please clear it away.



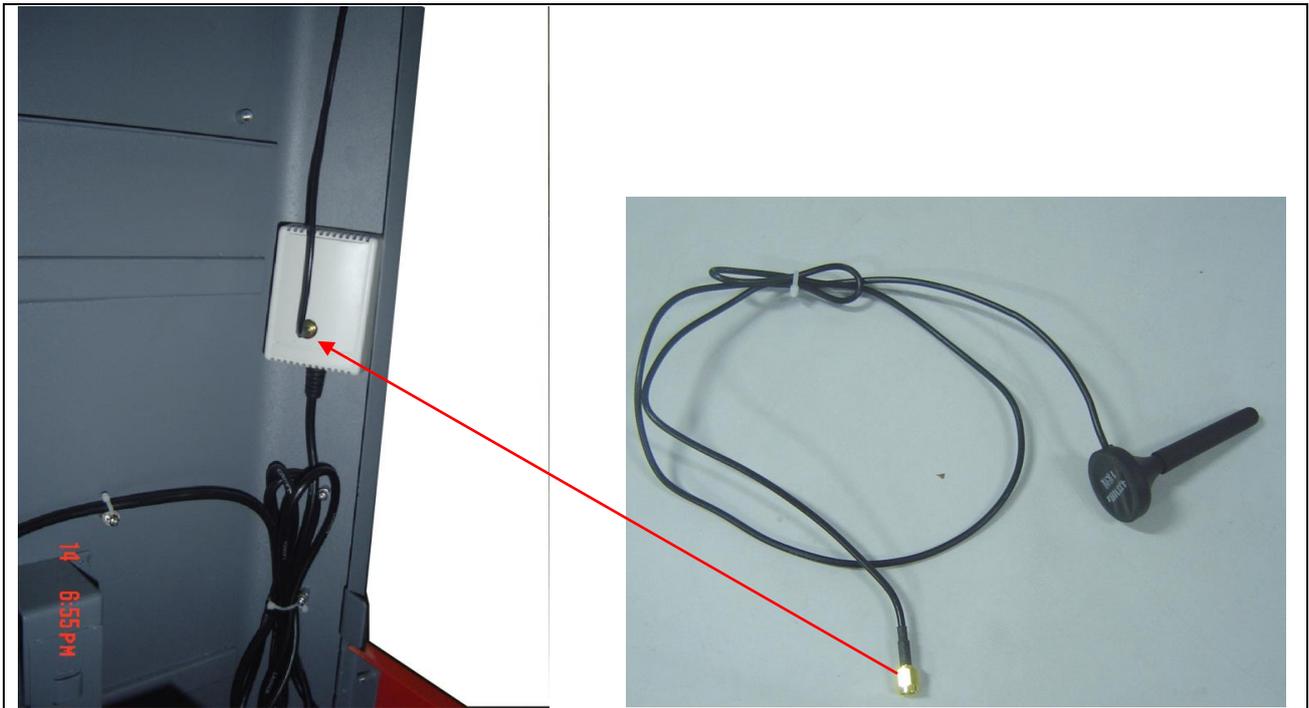
### Item10: Computer System Inspection and Disk Maintenance

<p>Check if the hardware configuration is normal (if it is not normal, the yellow exclamation mark will be displayed )</p>	
<p>Check if the files in hard disk are normal</p>	
<p>Hard disk maintenance (clear the disk and tidy up the disk fragments with the tools equipped by Windows XP itself)</p>	

### Item11: RF Emitter/Receiver Box Inspection

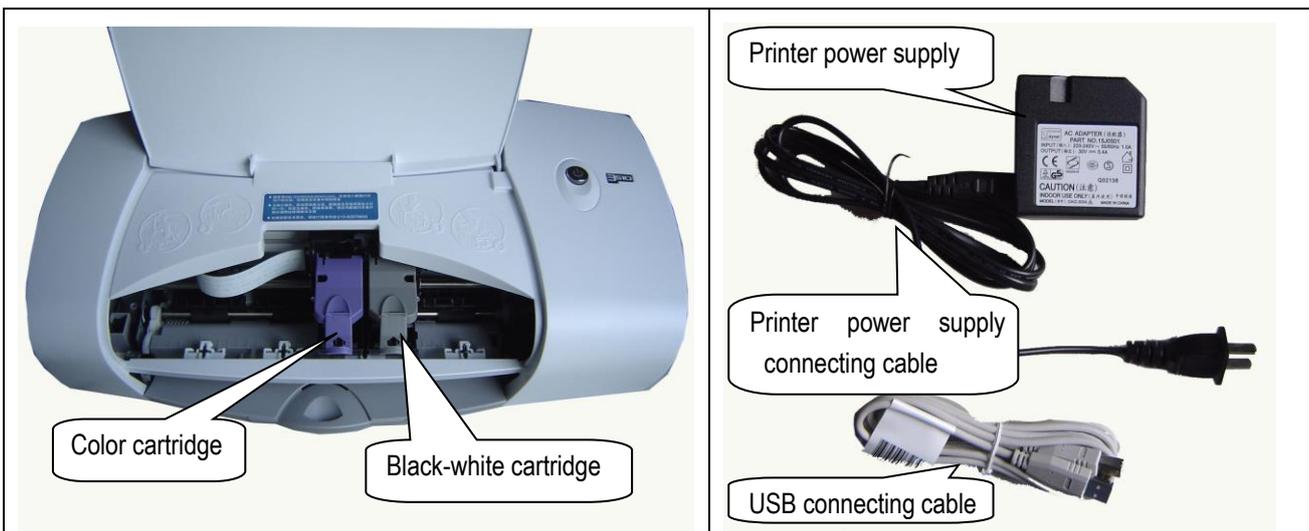
 <p>Antenna down-lead</p>	 <p>Receiver indicator</p> <p>Emitter indicator</p> <p>Power supply indicator</p>
<p>Cover-opened picture</p>	
<p><b>Note:</b></p> <ol style="list-style-type: none"> <li>1. Check RF box and connecting cable for damage;</li> <li>2. Open the cover, and then check the antenna base and connection base for oxidation and rust;</li> <li>3. After plugging the USB plug, the power supply indicator is lit;</li> <li>4. Receiver indicator (Green) and emitter indicator (Red) will flash continuously during communication.</li> </ol>	

### Item12: Antenna and RF Cable Inspection



**Note:** Check if RF cable and cupula antenna are damaged, and check if the connectors and antenna plastic bush are fastened firmly.

### Item13: Printer Inspection



1. Check and clear away the oil dirt and dust inside the printer;
2. Check if the nozzle is blocked by self-testing of the printer.

1. Check if power cable and USB connecting cable are damaged;
2. Check if the power supply box is distorted, and the contacts are in good condition.

## Maintenance and Testing for Measurement Probe Rod

### Item14: Visual Inspection and Cleaning for Probe Rod



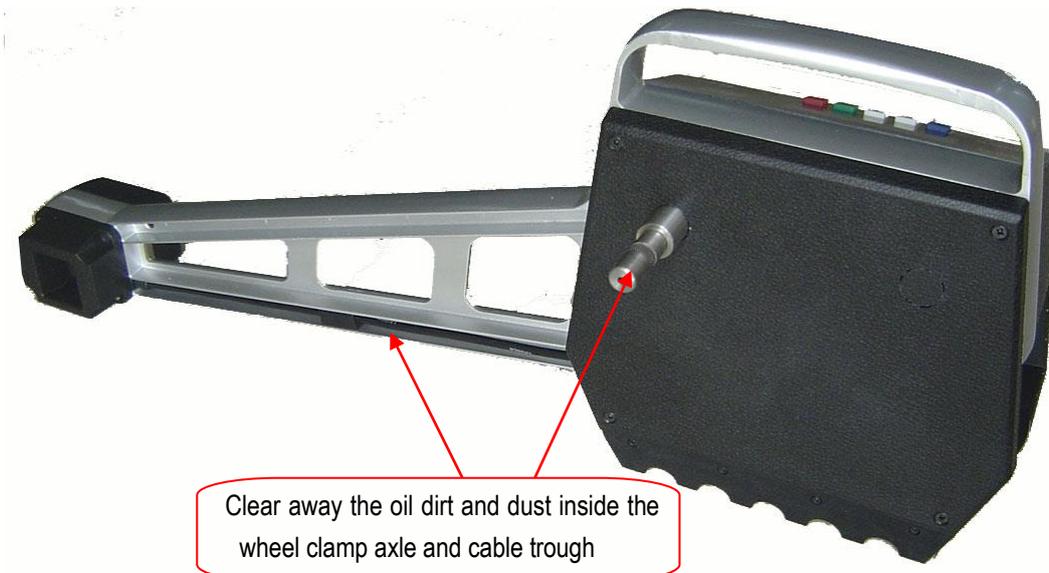
1. Clear away the oil dirt on the film;
2. Clear away the oil dirt on each surface and inside the gaps.



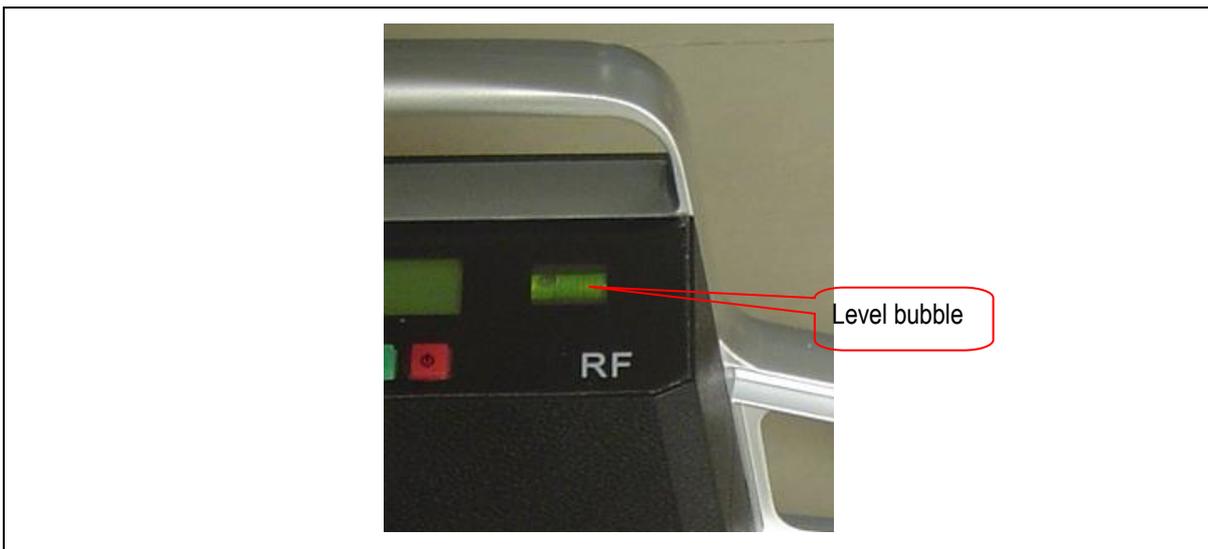
Check and clear away the oil dirt inside the charging socket.

Clear away the oil dirt on the filter with the cloth with soft nap.





### Item15: Level Bubble Inspection



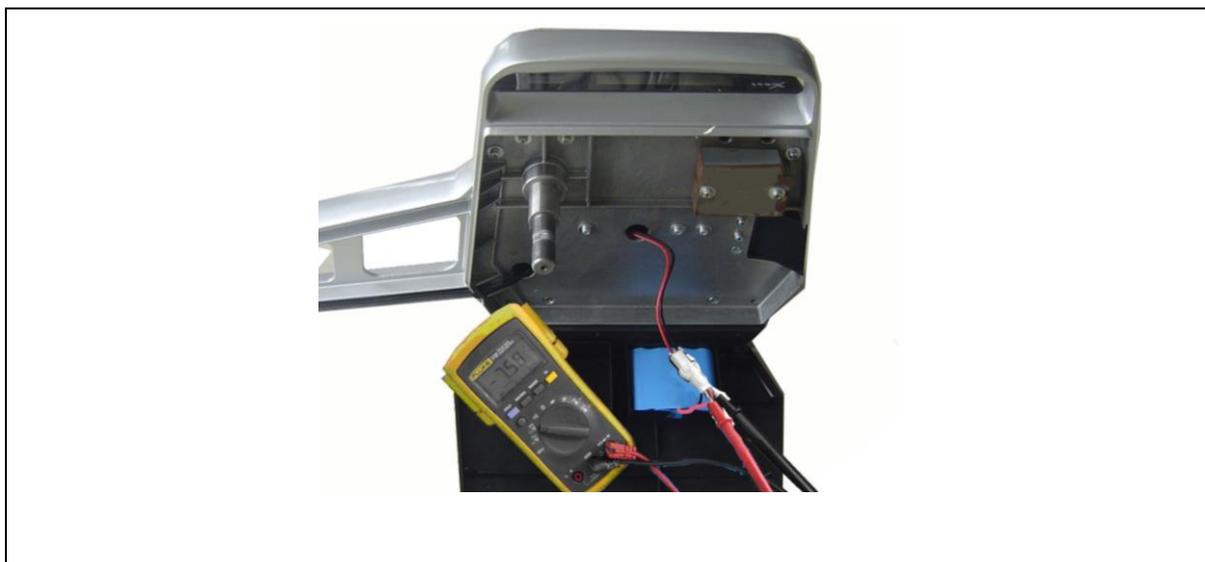
**Note:** 1. Check if the liquid inside the level bubble is normal, and if the glass body is broken;

## Item16: LCD Display Screen Inspection



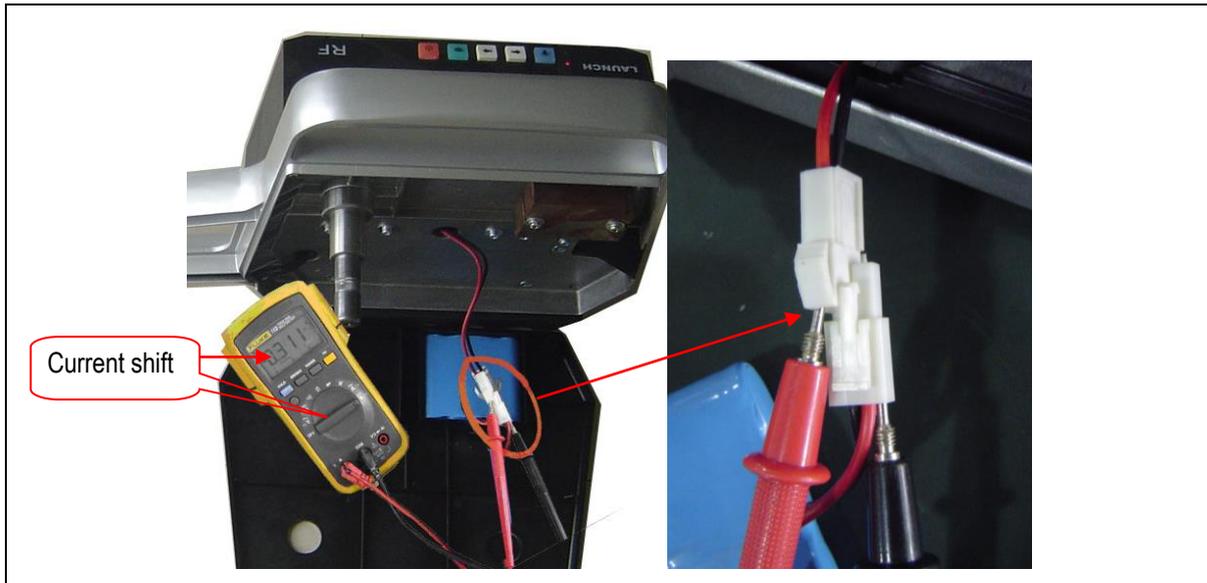
- Note:**
1. In case of switching off, check if there are black dots on LCD screen, and check if the LCD screen is broken;
  2. In case of switching on, check if there are bad conditions such as disorder codes, etc.;
  3. Check if backlight indicator is lit or not by pressing the backlight indicator key-press at the right end.
  4. Check key-press for good hand feeling and for fault, and check if there is oil dirt inside the gaps.

## Item17: Battery Inspection



**Note (Remove four locking screws at rear cover, and then open it):**

1. First, check if the battery casing is damaged, and check if its down-lead is damaged or not;;
2. Test the battery voltage with multi-meter, and compare it with the electricity quantity displayed on LCD screen to see if the deviation is large or not.



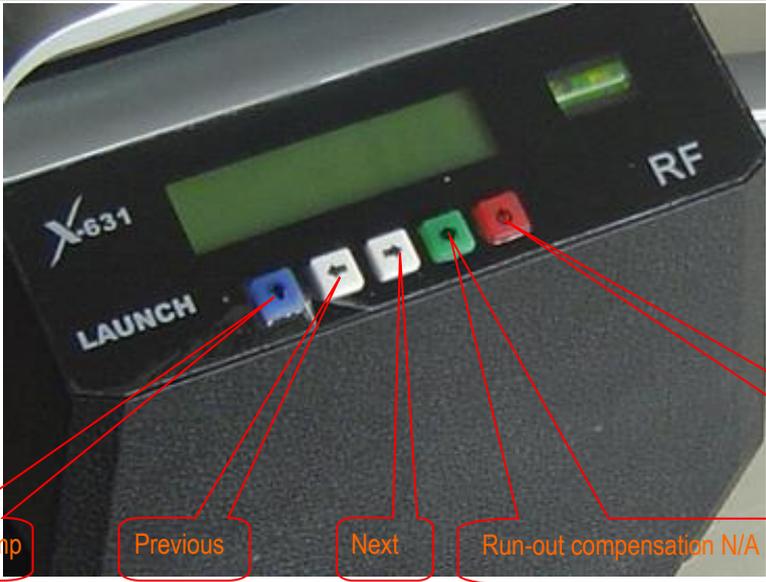
**Note:** According to the above figure, plug two black leads of the battery together, connect two probes of multi-meter (at AC/DC shift) to the other two red leads respectively (to form a complete serial circuit), and then plug the charging cable of the probe rod. Check if the charging current is normal or not (If the battery has no electricity, the charging current is about 600mA; if the electricity quantity of the battery is sufficient, the charging current is only between 20 and 100 mA).

### Item18: Wheel Clamp Axle Inspection



**Note:** Clear the wheel clamp axle, check if it is rusty, and lubricate it with appropriate oil

### Item19: Acrylic Panel and key-press Inspection

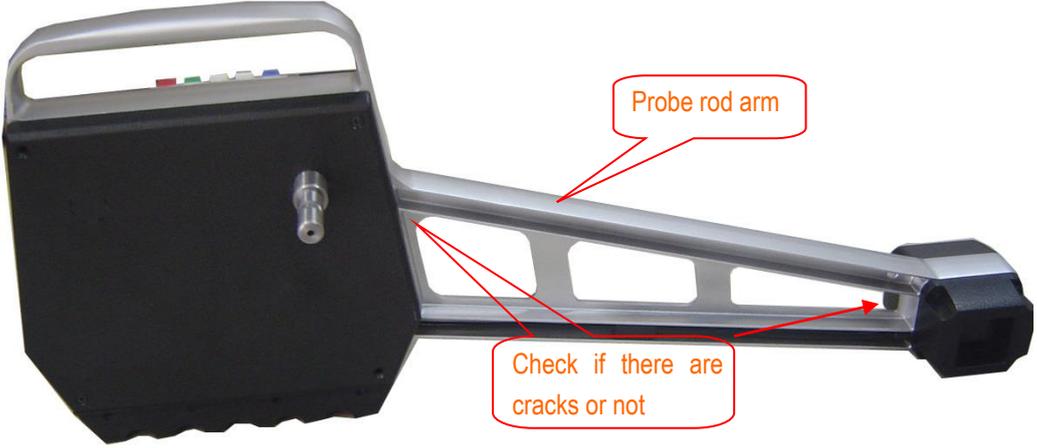


The image shows a close-up of the control panel of the X-631 wheel aligner. The panel is black with a green LCD screen at the top. Below the screen are several buttons: a blue button labeled 'Backlight lamp', a white button labeled 'Previous', a white button labeled 'Next', a green button labeled 'Run-out compensation N/A', and a red button labeled 'Power supply'. The panel also features the 'LAUNCH' logo and 'X-631' and 'RF' markings.

**Note:**

1. Check the surface of Acrylic panel and key-press, and then test each key-press for good hand feel;
2. Check if the function of each key is normal or not (Up and Down key can be tested by cooperating with computer measurement program).

### Item20: Aluminum Frame Inspection



The image shows the aluminum frame assembly of the wheel aligner. It consists of a black handle on the left and a long, thin aluminum arm extending to the right. The arm is labeled 'Probe rod arm'. A callout points to the transition corner of the aluminum bracket arm, stating 'Check if there are cracks or not'.

**Note:**

1. Check if probe rod aluminum bracket arm is distorted and damaged or not;
2. Check if there is crack at the transition corners of aluminum bracket arm.

### Item21: Testing for Wireless Communication Function

**WHEEL ALIGNER** **LAUNCH**

Status of probe rod

LR probe **LF probe**

RR probe **RF probe**

Probe rod communication status

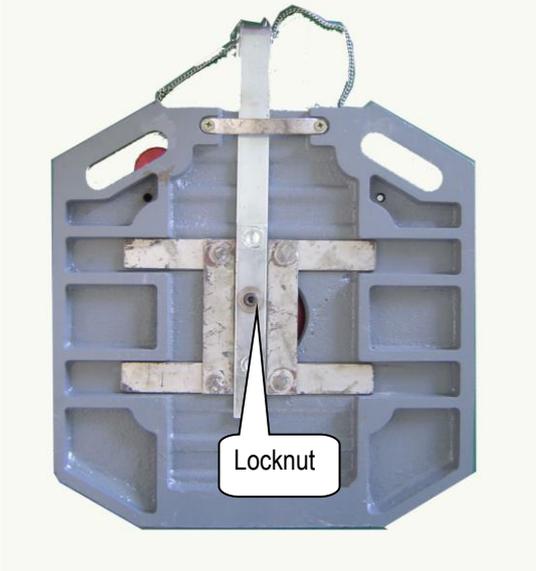
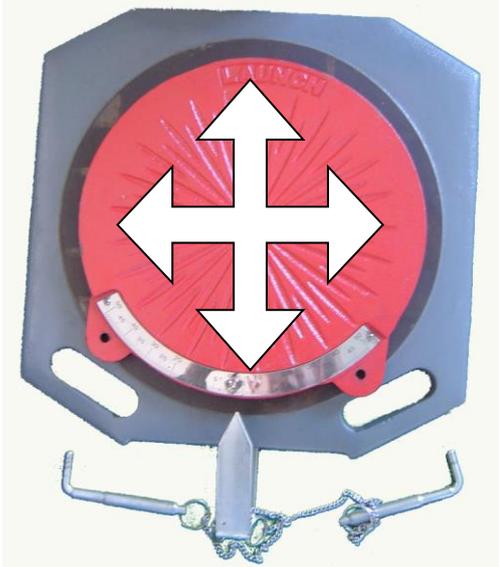
Probe rod electricity quantity status

10:52

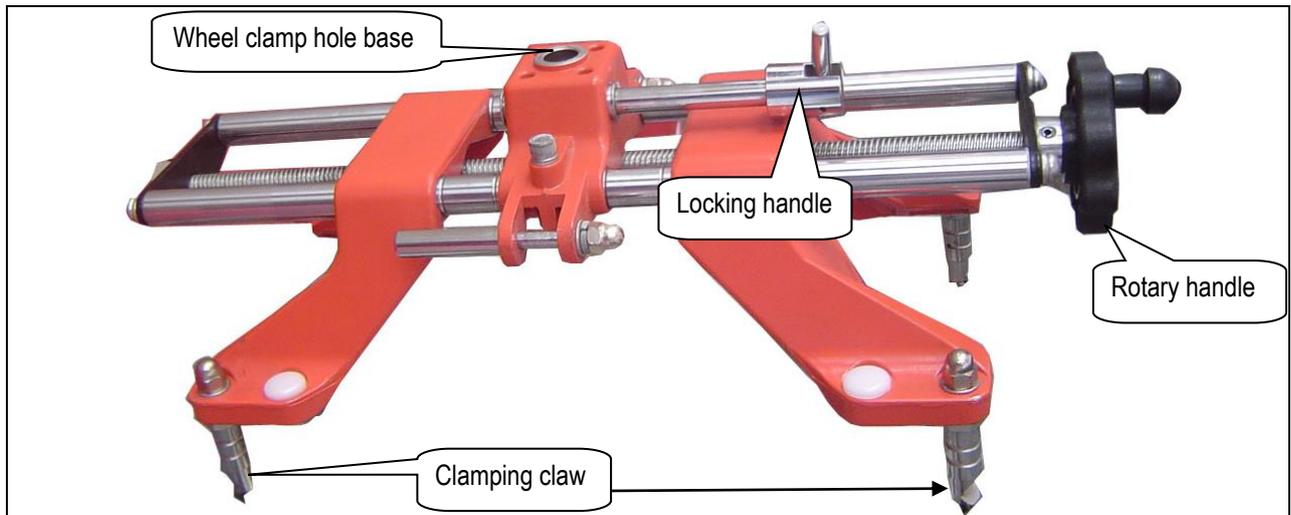
Note: Switch on the computer host, the Status of Probe Rod interface will be displayed as shown in the above figure; switch on the probe rods, and then put them on the place where is 15m away from the main unit; observe if the communication is normal and if there is Red Cross on the interface (Red cross indicates abnormal communication, and green tick indicates normal communication).

## Maintenance and Testing for Some Components

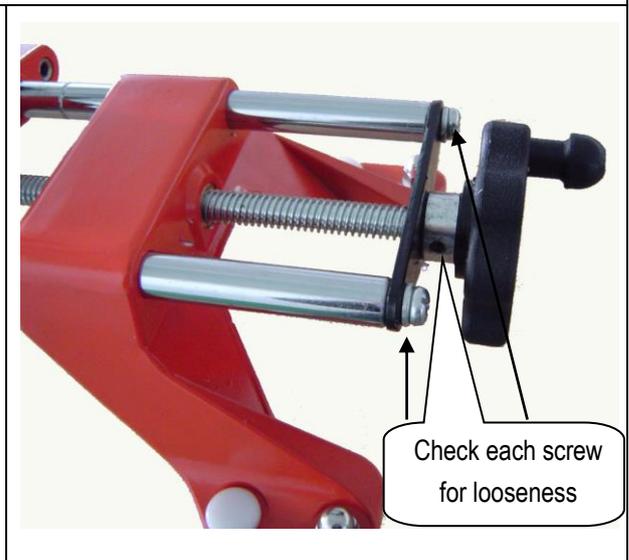
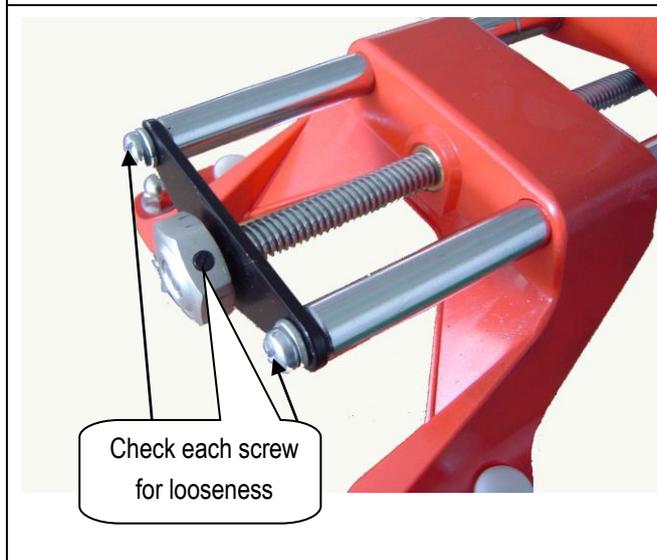
### Item22: Mechanical Turntable Inspection

 <p style="text-align: center;">Locking pin</p>	 <p style="text-align: center;">Locknut</p>
<p>Front side</p>	<p>Back side</p>
<p><b>Note:</b></p> <ol style="list-style-type: none"> <li>1. Check the turntable surface for paint removing and rusting condition;</li> <li>2. Check the locking screws on the back side for looseness;</li> <li>3. Check if the chain of locking pin is broken or not;</li> <li>4. Place the turntable in level status, release locking pin, push the turntable cover with hand to all directions in order to check if it moves smoothly (if it does not move smoothly, please release the fixing screw at the bottom, open the turntable and clear its inside).</li> </ol>	 <p style="text-align: center;">Move it left and right, back and forward</p>

### Item23: Wheel Clamp Inspection



- Note:**
1. Check the wheel clamp for distortion (especially for clamping claw);
  2. Check if the rotary handle can rotate normally or not, and check if the clamping claw can flex freely.
  3. Check if locking handle can lock the main axle of probe rod or not.



### Item24: Brake Pedal Depressor Inspection



- Note:**
1. Check the brake pedal depressor for distortion and damage;
  2. Check if clip plate spring can move normally, and check if the moving assembly can slide along the leader freely.

### Item25: Steering Wheel Holder Inspection

<p><b>Note:</b></p> <ol style="list-style-type: none"> <li>1. Check the fixing bracket for distortion, and check the base for break;</li> <li>2. Check if the clip plate can be pressed or not, and check if the moving part can move or not.</li> </ol>	A diagram of a Steering Wheel Holder tool. It features a red circular base, a central vertical shaft, and a moving assembly with two curved arms. A clip plate is attached to the side of the moving assembly. Three callout boxes with leader lines point to the 'Moving assembly', 'Base', and 'Clip plate'.
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## Probe Rod Calibration

The probe rod calibration procedures are as follows:

- ✧ After starting the computer, the system will enter the Probe Rod Maintenance interface of X-631 test program.



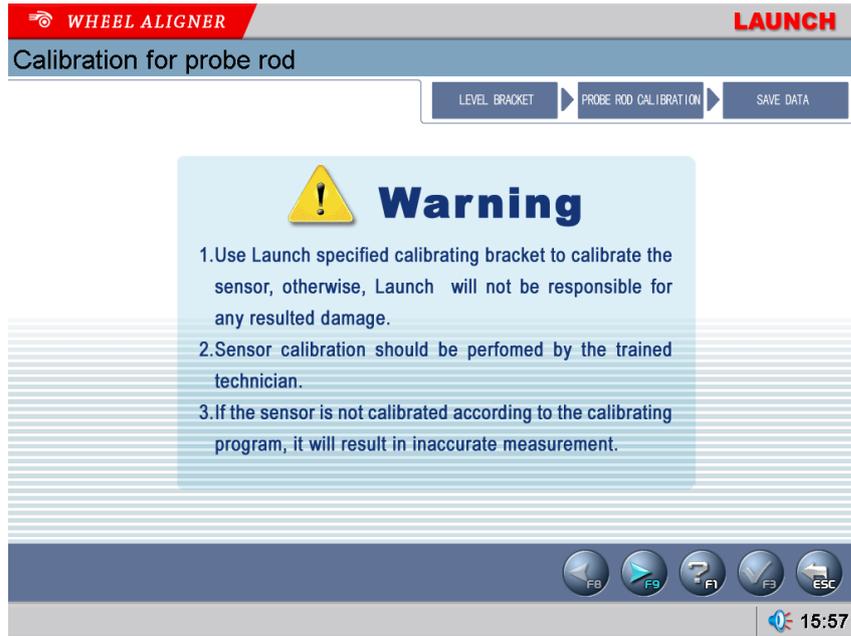
- ✧ **Structure of calibrating frame**



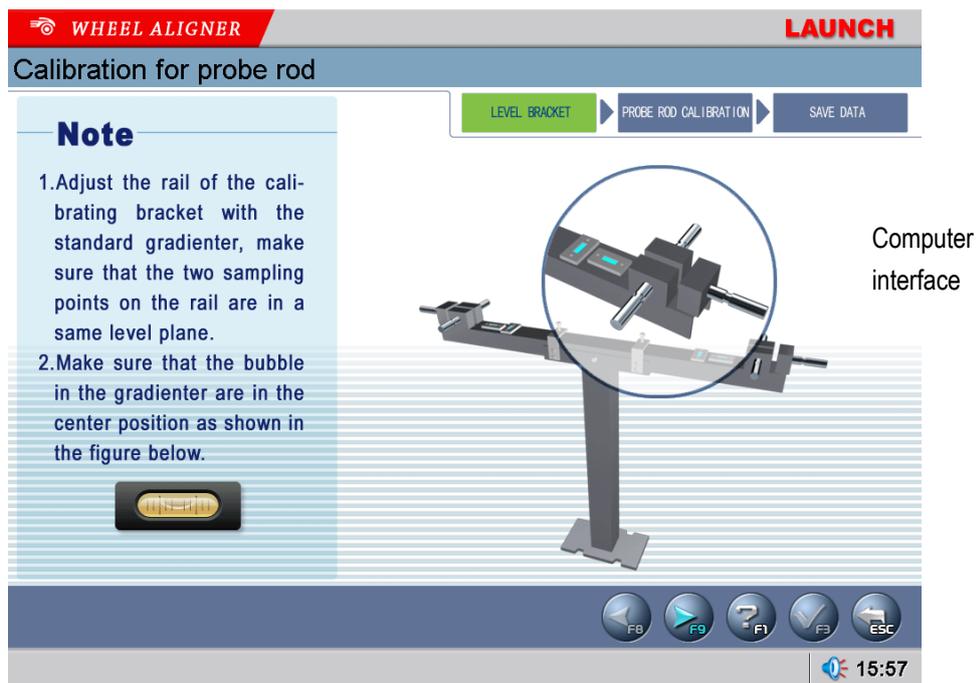
1. Left and right brackets; 2. Long lateral axle; 3. Left and right vertical axles

- ✧ **Probe rod calibration procedures**

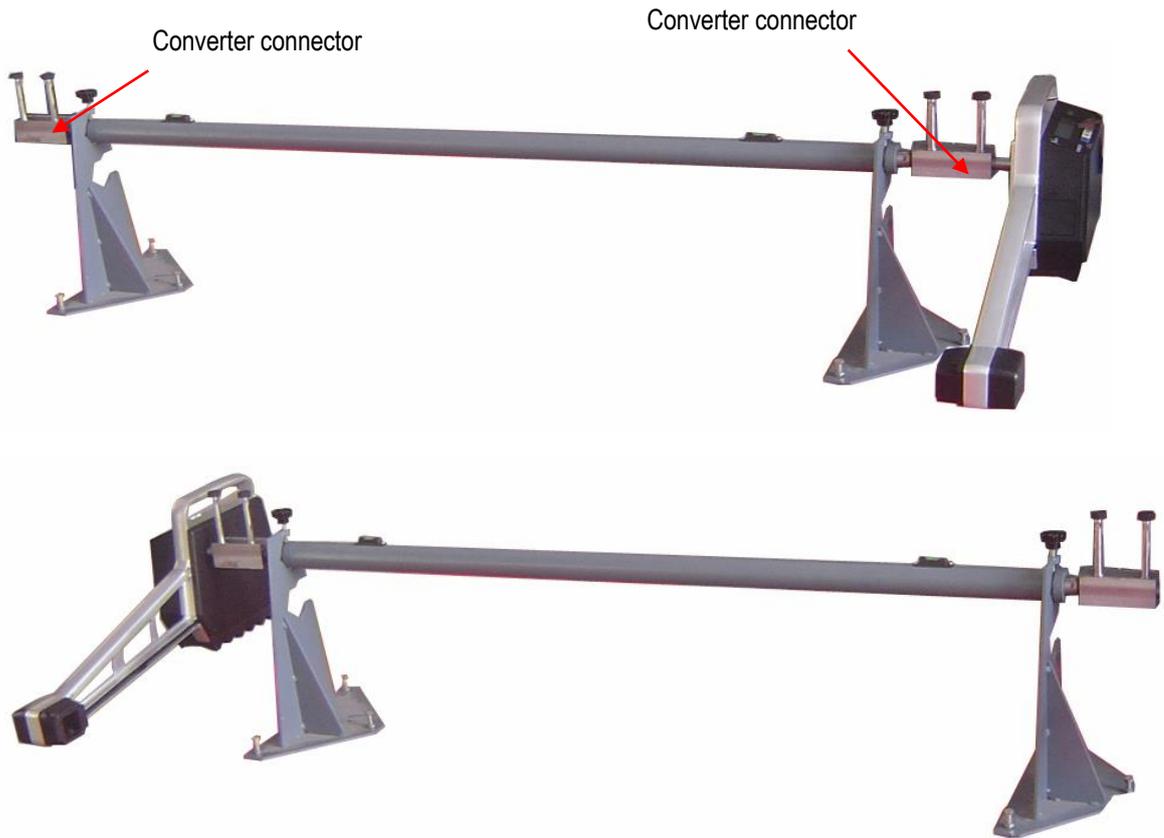
- After inputting the password, the system will enter the following interface:



- b) Install the small calibration frame well according the installation requirements, and then adjust the lateral axle and vertical axle level (It is required to use the probe rods for auxiliary level adjustment of the small calibration frame).



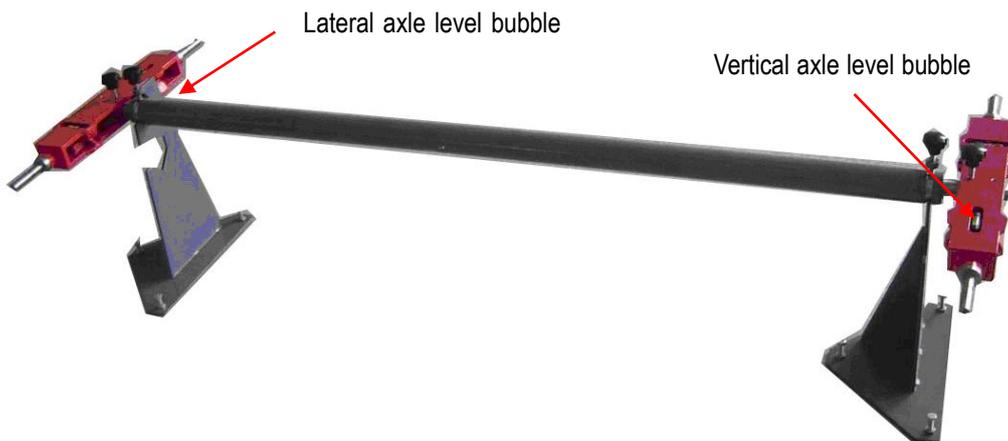
- Adjust the lateral axle level: Install the FL probe rod on the two ends of the lateral axle respectively (as shown in the following figures), and then adjust the adjusting screws of the brackets to keep the lateral axle level.



- Check if the linearity of the lateral axle is up to standard: Install 1# and 2# probe rod on the two ends of the lateral axle respectively (as shown in the following figure), read the corresponding CCD values from computer test program, and then compare the values with the corresponding calibrated values in CHECK file, the difference between them are required to be less than 2 percent;



In succession, turn the two probe rods by 180 degrees respectively, and read 1# and 2# CCD values, and then compare them with the corresponding values from CHECK file (the same as the previous procedure), the difference between them are required to be less than 2 percent. If the two procedures above-mentioned are all satisfied, it indicates that the linearity of this calibration frame is up to standard, and can be used. After installing the two vertical axes, the calibration frame installation procedures are finished.



c) Calibration for 1# and 2# clinometer and end CCD camera

The screenshot shows the 'WHEEL ALIGNER' software interface. At the top, it says 'WHEEL ALIGNER' and 'LAUNCH'. Below that is the title 'Calibration for probe rod'. There are three buttons: 'LEVEL BRACKET', 'PROBE ROD CALIBRATION' (highlighted in green), and 'SAVE DATA'. On the left, a 'Note' box contains three instructions: 1. Connect sensor, cables and PC according to the illustration. 2. Make sure to tighten each connector. 3. Keep the air bubble of the sensor on the calibration bracket in the middle (as shown below). Below the note is an image of a level sensor. On the right, there are two data displays. The top one shows '1#CCD: 825' and '2#CCD: 1165' with a horizontal axis from X0 to X8 and a blue dot at X3. The bottom one shows '1#H: 1988', '1#V: 1002', '2#H: 2106', and '2#V: 1918' with a horizontal axis from X0 to X8 and three colored dots (yellow, white, purple) at X4. Below these displays is an image of the 'LF probe rods' and 'RF probe rods' assembly. At the bottom of the interface are navigation buttons for F8, F9, F1, F3, and ESC, along with a clock showing 15:57.

Computer interface

First, please remove the two vertical axes from the small calibration frame, and then install 1# and 2# probe rods at the two ends of the long lateral axle of calibration frame and adjust them level, as shown in the following figure:



d) Calibrate 3# and 4# probe rod clinometer and end CCD (the operating methods are the same with the

previous step)

**WHEEL ALIGNER** **LAUNCH**

### Calibration for probe rod

LEVEL BRACKET | **PROBE ROD CALIBRATION** | SAVE DATA

**Note**

1. Connect sensor, cables and PC according to the illustration.
2. Make sure to tighten each connector.
3. Keep the air bubble of the sensor on the calibration bracket in the middle (as shown below).

7#CCD: 760  
8#CCD: 1217

3#H: 2159  
3#V: 2062  
4#H: 2028  
4#V: 2039

LR probe rods

RR probe rods

Computer interface

F8 F9 F1 F3 ESC

15:58



- e) Last step: click [NEXT] to save data as shown in the following figure (new “**check.ini**” file will be saved under the installation directory).

**WHEEL ALIGNER** **LAUNCH**

Calibration for probe rod

LEVEL BRACKET ▶ PROBE ROD CALIBRATION ▶ SAVE DATA

**Note**

OK

Computer interface

F8 F9 ? F1 F3 ESC

15:58