Version #:11.0.0.30

3D WHEEL ALIGMENT OPERATION MANUAL

Chapter 1 General Introduction

1.1 Introduction

This manual provides the equipment information and operation instructions of DT1//3 serials 3D wheel alignment.

Our technician is in charge of equipment installation and operation training. It requires the person who has wheel alignment and computer acknowledge to operate the machine.

Our manual based on the user who knows the basic acknowledge of wheel alignment.

1.2 System Requirements

3D Master Aligner program is compatible with 64 digit and 32 digit system, can be installed on windows7\windows10 operation system. It need to install WIN7 driver program when install on WIN 7 system computer, but WIN10 doesn't need.

PC configuration requirements:

CPU: above Intel G2020

RAM: above 4G

Window system: it must installation version operation system, can't use copy version operation system

1.3 Safety Indication

Important safety indication: please read the warning label on the cabinet carefully. Mistaking operation will destroy the equipment, or reduce the using life.

It must put the rubber block under the wheels after the vehicle driving on the elevator.

It can't use defective or broken tools to operate. It must use the cable with the equal or above equipment rated current if need to prolong the electronic cable.

Check the power supply, the charging socket must connect the floor correctly. To avoid electrical shock hazard, please don't put the machine on the wet floor, please don't operate flammable and combustible materials.

Note: please don't turn off power when the computer is running, or will destroy the disc.

Warning: can't modify the power sockets, the improper power sockets will destroy the equipment or hurt people.

The operator modifies equipment without distributor or manufacturer's agreement will lost the after-sale service support.

Our default voltage is 220V 50/60Hz, Chinese standard sockets. Please contact the manufacture to state if the customer need 110V, or need other country's sockets like European or USA etc.

For safety, ground cable or voltage stabilizer is necessary, power cable must be good without damaged.

1.4 Technical Parameters

Power Supply: 220-240V AC

Frequency: 50/60Hz Power: 0.5kW

Working Temperature: +5℃…＋40℃

Measurement Item	Measurement Precision	Measurement Range
Total Toe (front and rear wheels)	±2′	±2°
Individual Toe	±2′	±2°
Camber	±2′	±3°
Wheel offset (front axle)	±2′	±2°
Thrust Line	±2′	±2°
Caster	±4′	±18°
KPI	±4′	±18°
Toe out on turns	±4′	±20°
Adjustment range of Caster	±4′	±7°
Wheel offset (rear axle)	±2′	±2°
Wheelbase offset	±3′	±2°
Tread offset (left and right)	±2′	±2°
Axle offset	±3′	±2°

1.5 Lift Requirements

There isn’t special requirements for wheel alignment operation area, the operation area has enough space to install one unit four

post lift or scissor lift, and the car can drive on easily will be ok.

Check the lift or other measurement platform level situation:

All the wheel support points (turntable, slide slip) should be on an approximate plane.

Chapter 2 Wheel Alignment Installation

2.1 Equipment Installation

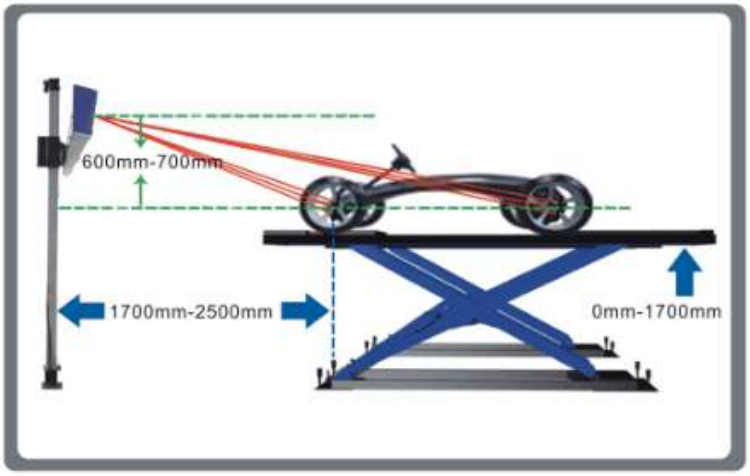
3D wheel alignment installation:

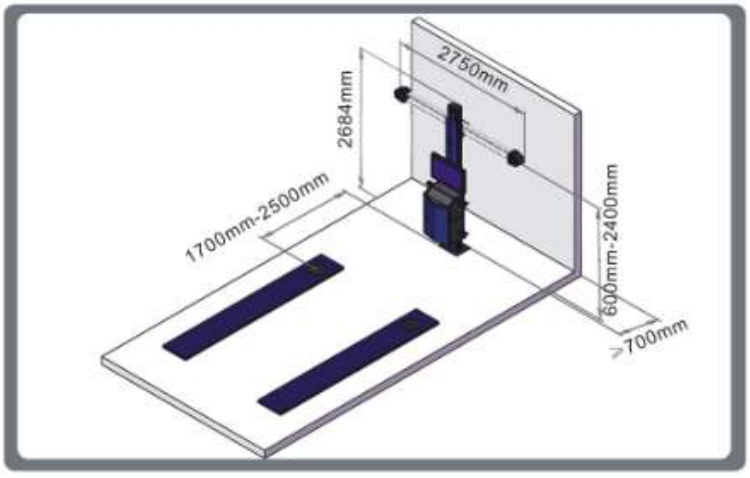
1. Check all the accessories that equipped with the equipment before installation.
2. Lift must be installed first. (four post lift or scissor lift)
3. Check the working space, make sure there is enough space to install the 3D wheel alignment equipment.
4. Fix the stand column’s feet on the ground, install the stand column.
5. Install cabinet and monitor.
6. Install camera cross beam, use fastening bolt to fix.
7. Install clamp’s bracket and targets.

8. Check all the cable connections and make sure all the connections are correct.
9. Connect with power, turn on wheel alignment equipment, run 3D Master Aligner program.
10. Select vehicle model specification to test. The installation is finished.

2.1.1 3D alignment equipment and lift installation distance

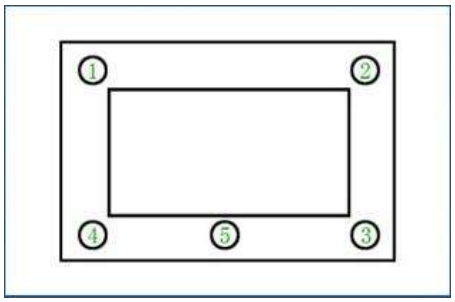
Installation distance between 3D alignment equipment and lift is 1.7m—2.5m (distance is from the stand column to the center of the turntable).





2.1.2 3D alignment stand column installation

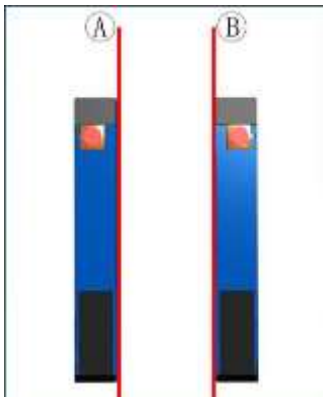
1.2.1 Feet of 3D alignment stand column



The bolts position to fix the feet: 1,2,3,4

The bolt positon to adjust the feet: 5

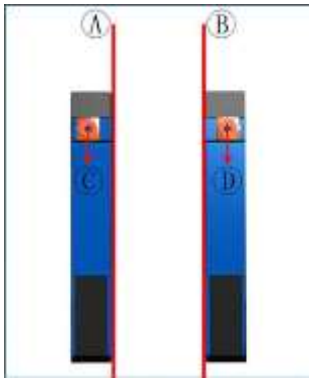
Step 1: confirm the center line of the lift



1. Confirm the inner side line of the lift A,B.

A：left inner side of the lift

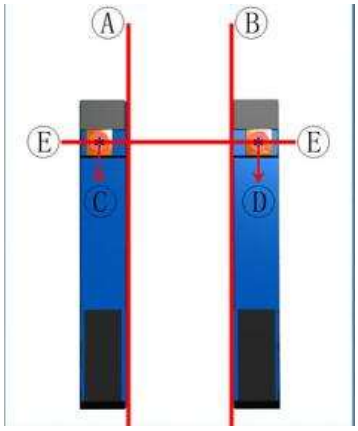
B：right inner side of the lift



2. Locate the turntable position on the lift, confirm the center point of turntable C, D.

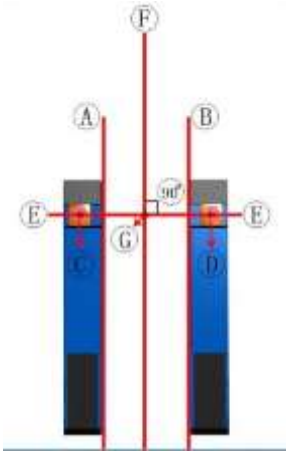
   C: left turntable's center point

   D: right turntable's center point



3. Confirm the connection line E from point C to point D.

   E: the connection line between point C and point D.



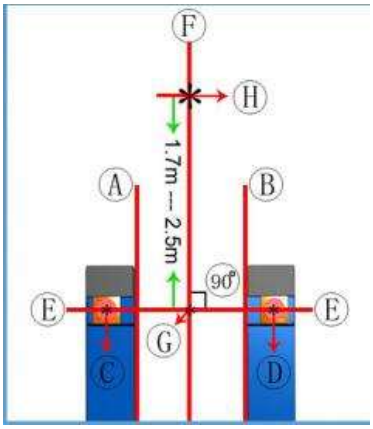
4. Confirm the middle line F between line A and line B, line F is perpendicular to line E, and the cross point is G.

   F: the center line between line A and line B

   G: the cross point of line F and line E.

   Note: line E between the center of the turntables must be perpendicular to the middle line F of the lift.

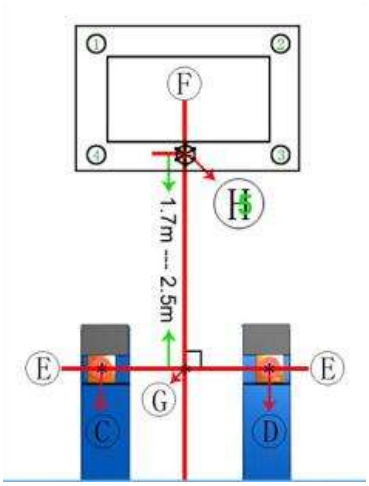
Step 2: confirm the center point of stand column's feet



1. Based on point G as start point to prolong forward to 1.7m—2.5m, the distance according to workshop's working space, confirmed point is H.

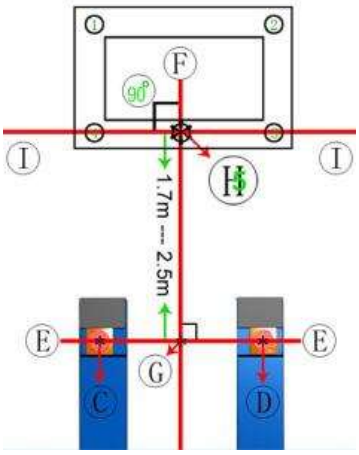
   H: center point of feet of alignment equipment.

Step 3: locate the feet of stand column on the center line F, let the adjustable bolt (number 5) coincide with point H, then fix the number 5 anchor bolt.



Note: don't fully lock the anchor bolt in number hole, because the other four holes position (1,2,3,4) need to be adjusted according to number 5 hole.

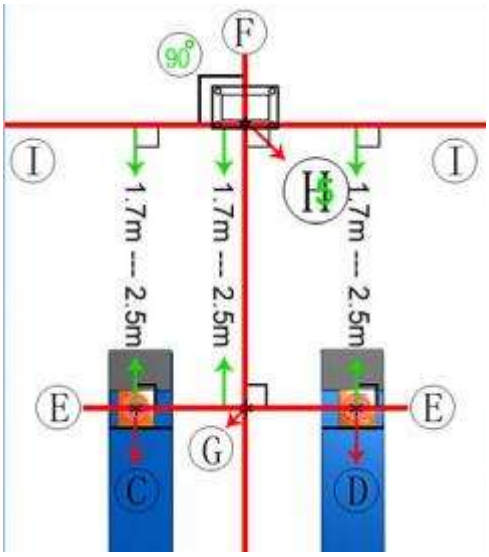
Step 4: confirm the connection line among number 3, 4 and 5.



1. Based on hole 5 to confirm one prolong line I between hole 3 and hole 4. Line I is perpendicular to line F.

I: the prolong line among hole 3, 4 and 5.

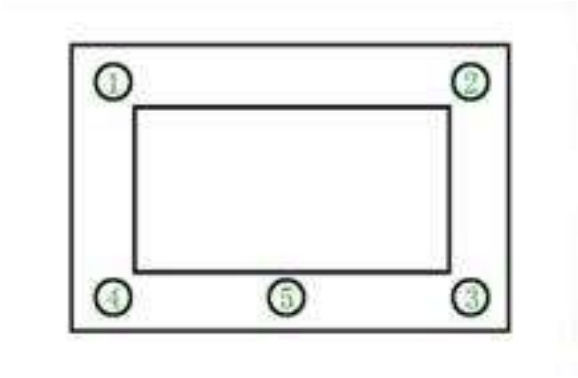
Note: line I must be perpendicular to the lift's center line F.



2. Line I is parallel to line E.

The distance between line I to point C and line I to point D is same.

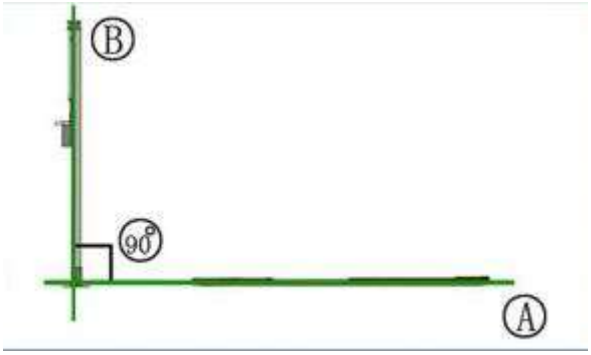
Step 5: locate the anchor bolts in hole 1, 2, 3 and 4.



一. When fix the stand column, must make sure the feet's plane is parallel to lift's plane.

Line A: lift's plane

二. Stand column must be perpendicular to the lift's plane.



Line A: lift's plane

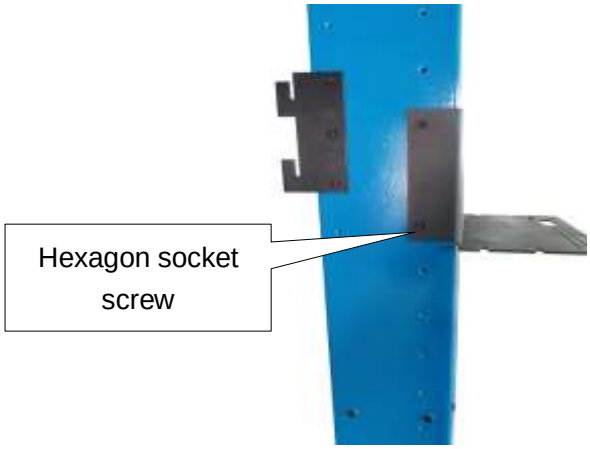
Line B: perpendicular line of stand column

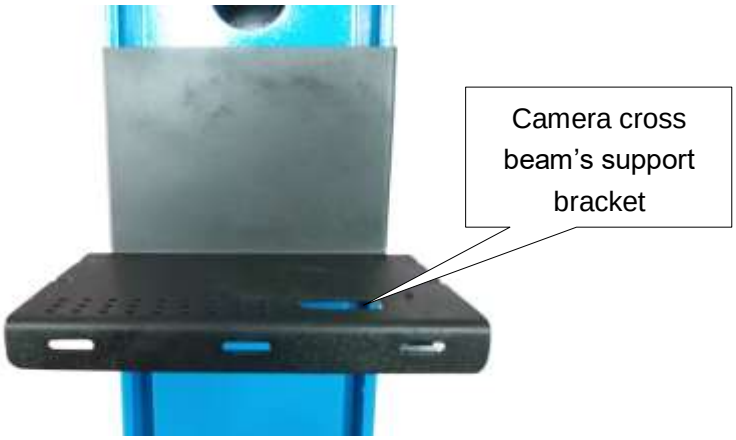
Note: stand column's perpendicular line B must be perpendicular to lift's plane A, or will change the camera's view field range.

2.1.3 3D Camera cross beam installation

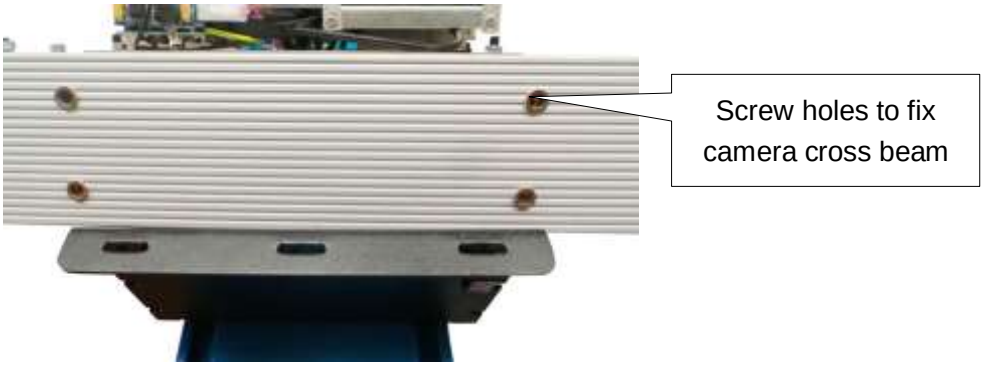
1. Fixed type camera cross beam installation

After fixed type stand column installation, prepare the camera cross beam and its support bracket.

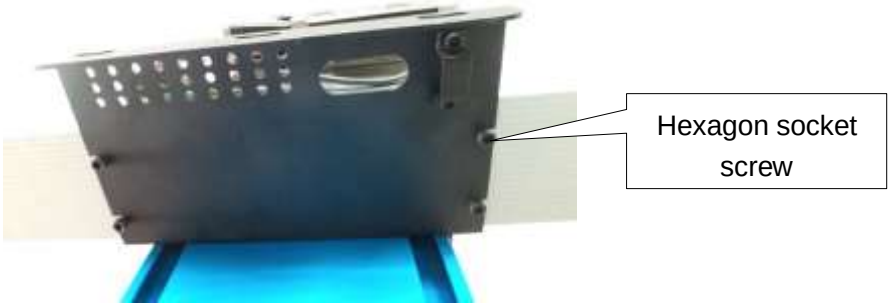




Step 1: install camera cross beam's support bracket first, and prepare to install camera cross beam.

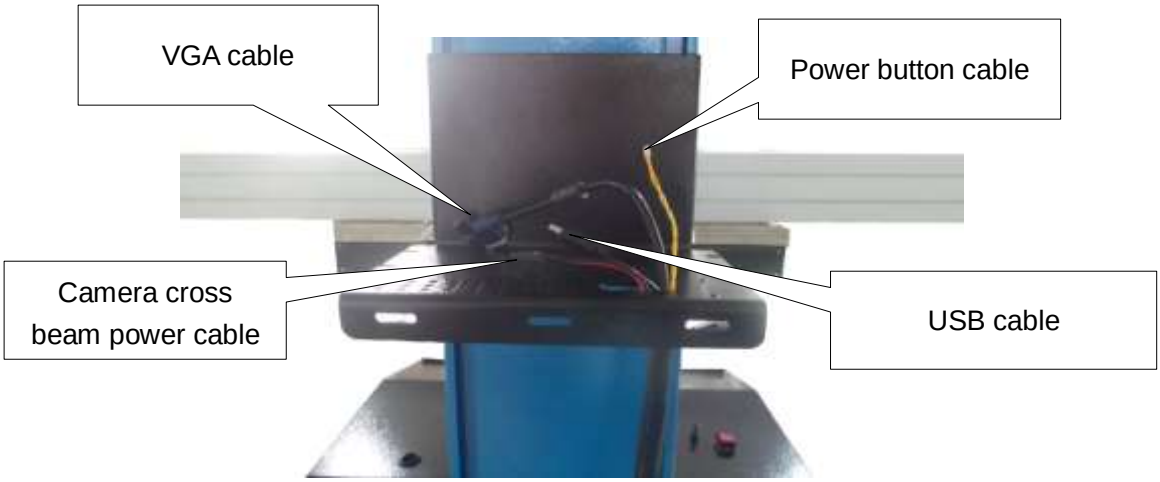


Step 2: let the screw holes side close to the support bracket.

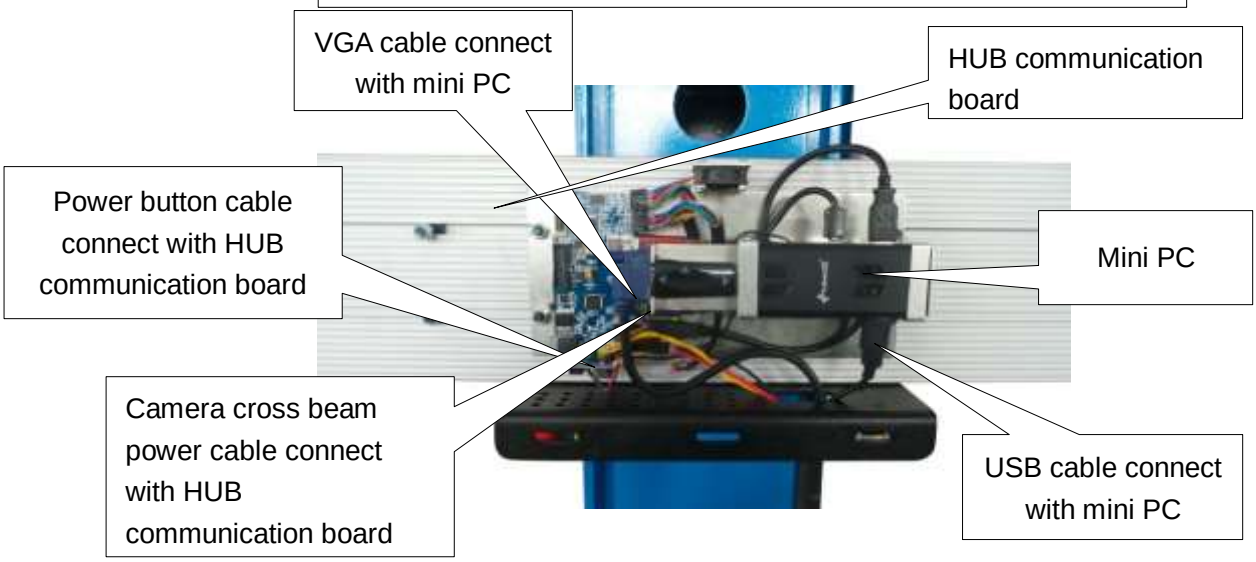


Step 3: use socket head wrench to tighten the screws to fix the camera cross beam.

Step 4: fix the four wires main cable.



Step 5: all the connection cables in main cable, prepare to connect with HUB communication board and mini PC.



Step 6: finish the HUB communication board and mini PC's cables connection.

Step 7: use T shape screws to fix the HUB communication board box

Step 8: adjust camera cross beam support bracket, fix camera cross beam's position.

Step 9: installation is finished.

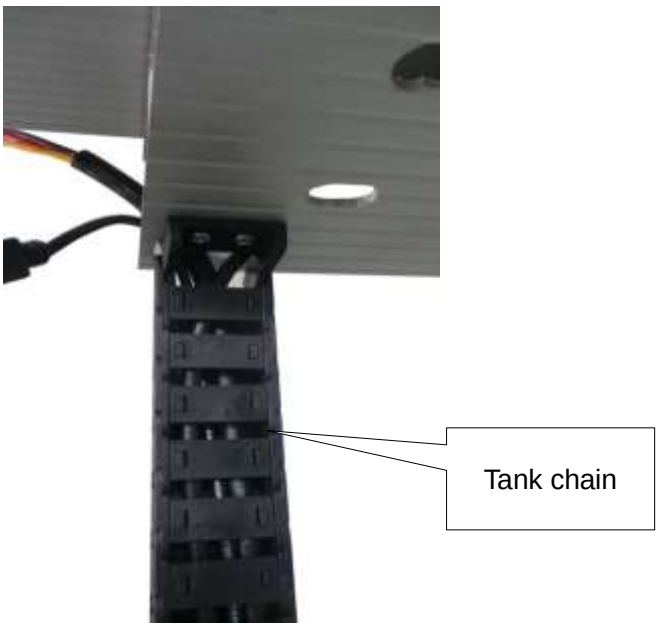
2. Manually lifting type camera beam installation

After manually lifting type stand column installation, prepare the camera cross beam and its support bracket.

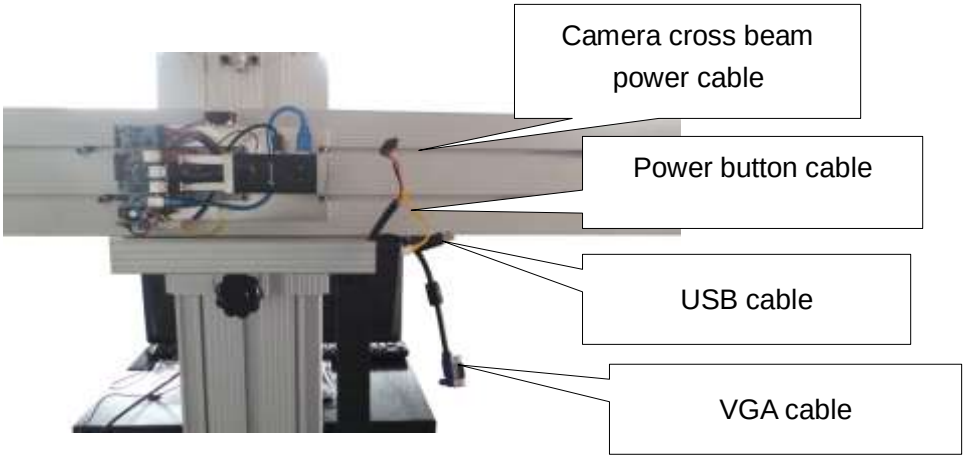
Step 1: install camera cross beam's support bracket first, and prepare to install camera cross beam.

Step 2: let the screw holes side close to the support bracket.

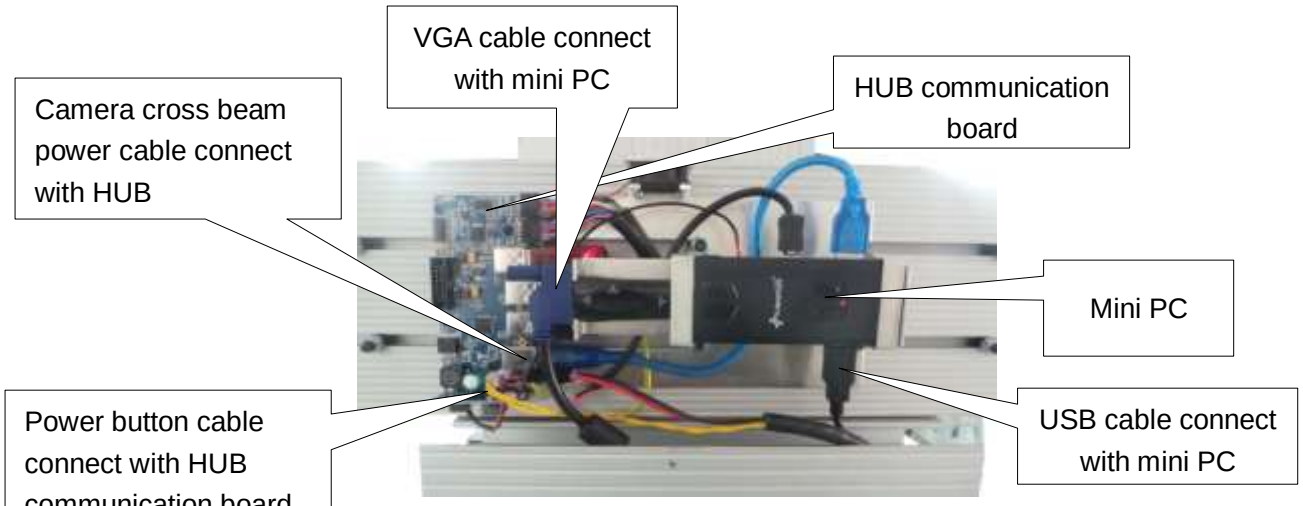
Step 3: use socket head wrench to tighten the screws to fix the camera cross beam.



Step 4: fix the 4 wires tank chain



Step 5: all the connection cables in tank chain, prepare to connect with HUB communication board and mini PC.



Step 6: finish the HUB communication board and mini PC's cables connection.

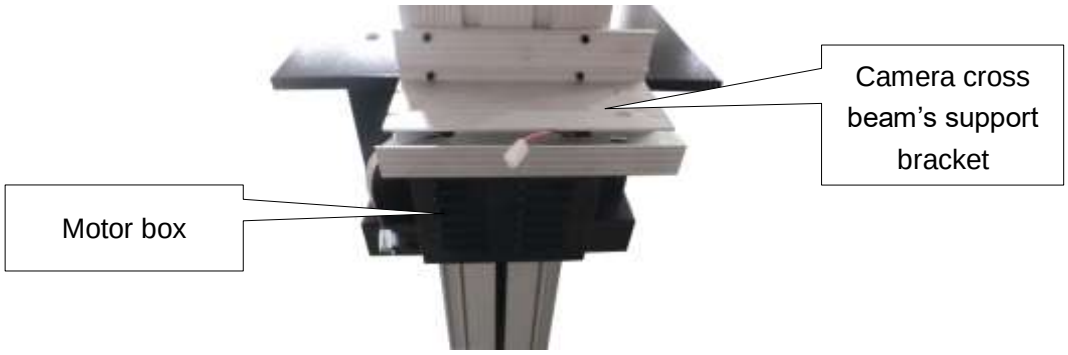
Step 7: use T shape screws to fix the HUB communication board box

Step 8: loosen the Fastened handle, adjust the camera cross beam position.

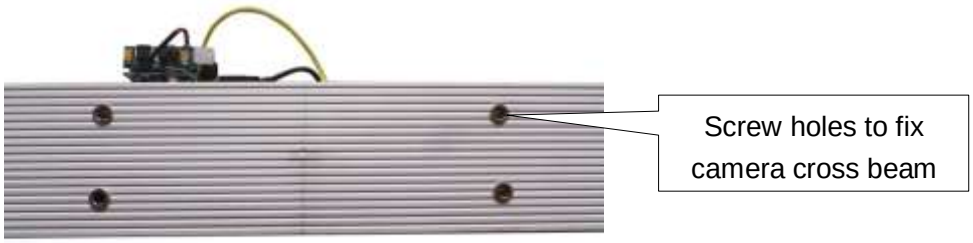
Step 9: installation is finished.

3. Automatically lifting type camera beam installation

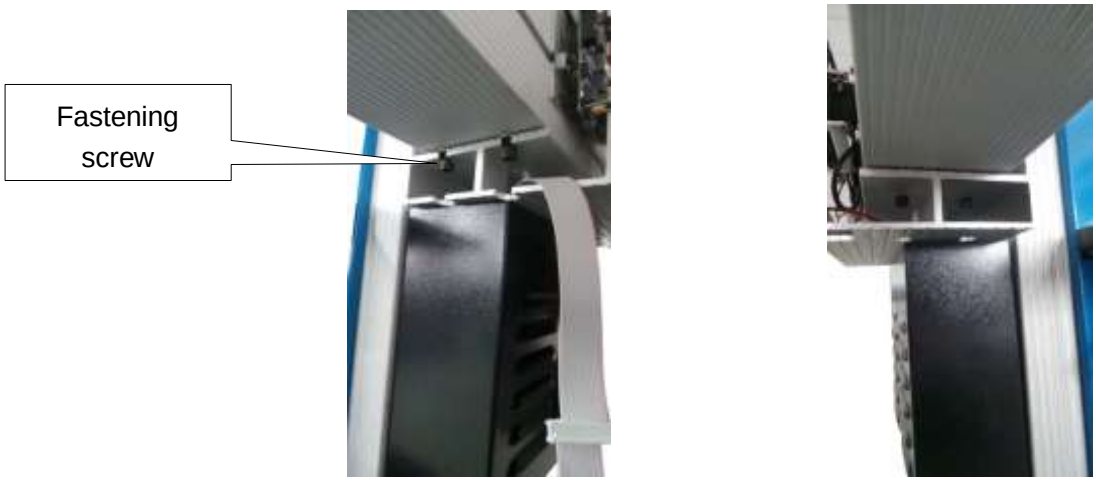
After automatically lifting type stand column installation, prepare the camera cross beam and its support bracket.



Step 1: install camera cross beam's support bracket first, and prepare to install camera cross beam.

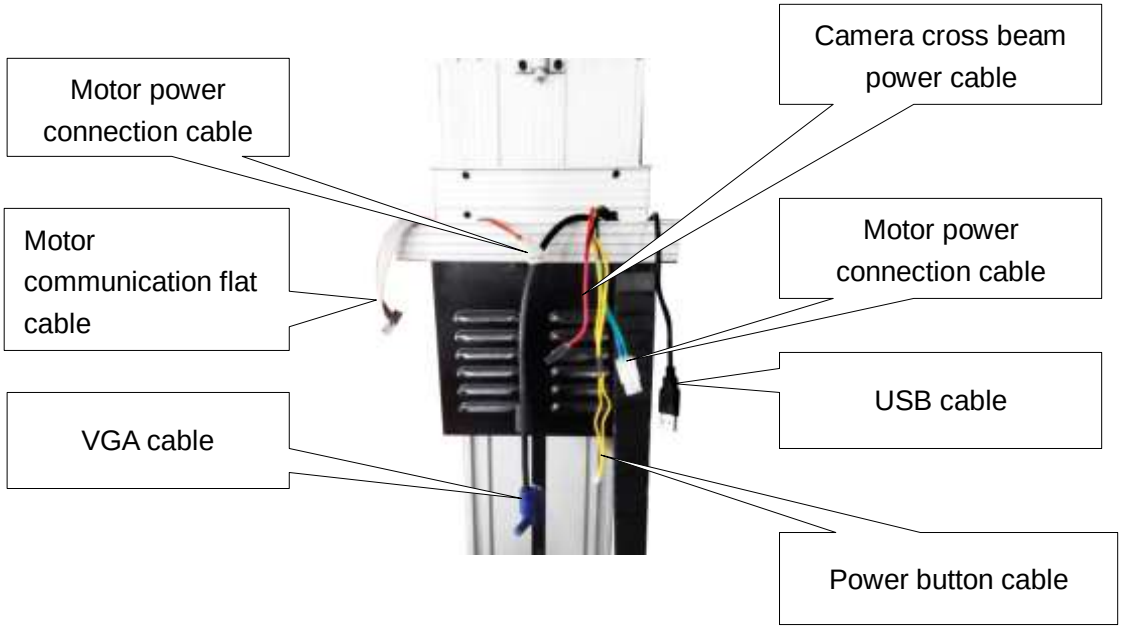


Step 2: let the screw holes side close to the support bracket.

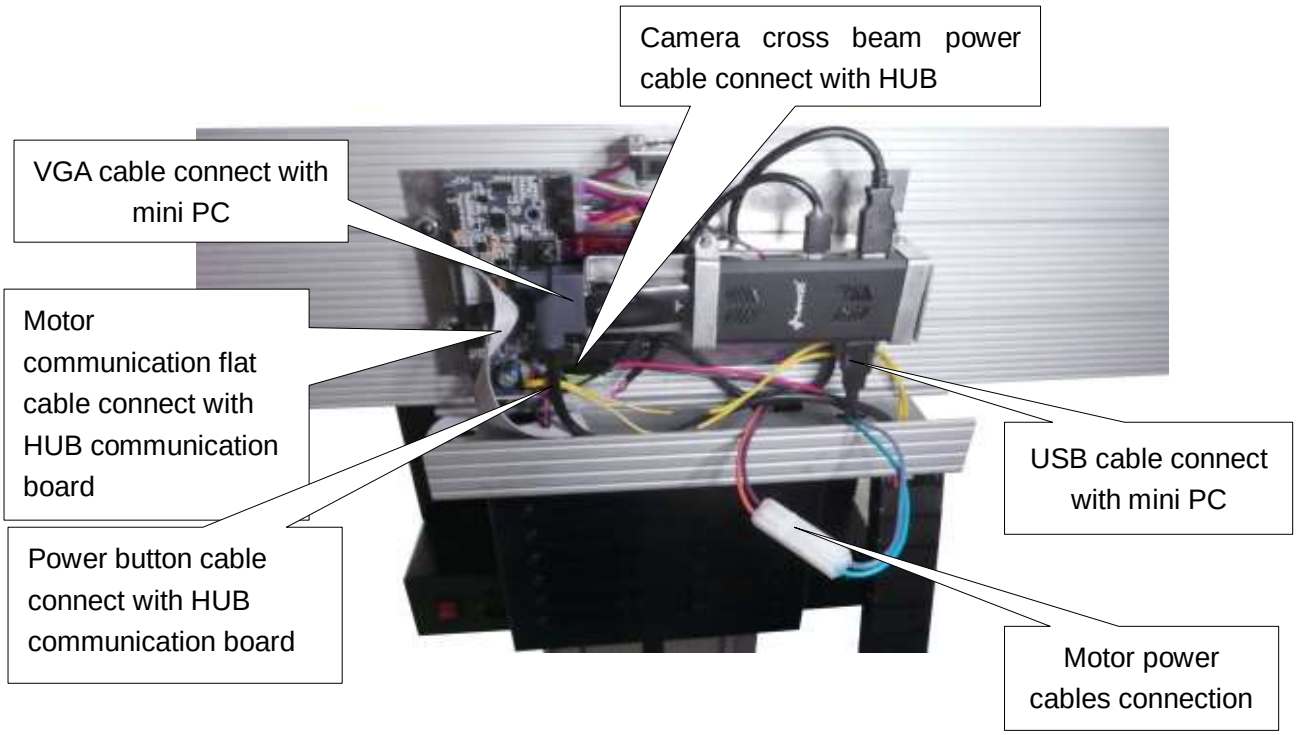


Step 3: use socket head wrench to tighten the screws to fix the camera cross beam.

Step 4: fix the 6 wires tank chain

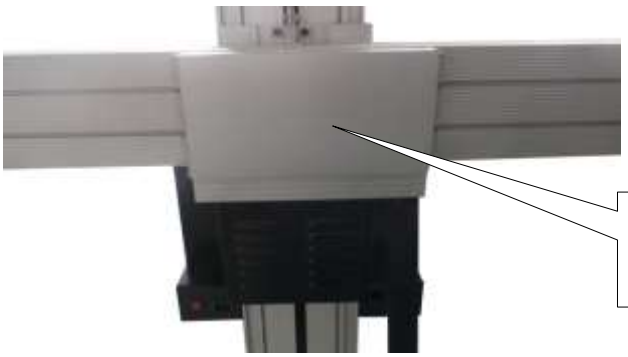


Step 5: all the connection cables in tank chain and motor, prepare to connect with HUB communication board and mini PC.



Step 6: connect the HUB communication board and motor's corresponding cables. Especially note the motor power cable's connection and motor communication flat cable's connection with HUB communication board.

Step 7: use T shape screws to fix the HUB communication board box



Step 8: enter software program, click “automatically search targets” button, camera beam will move up and down to find the targets to locate the correct position.

Step 9: installation is finished.

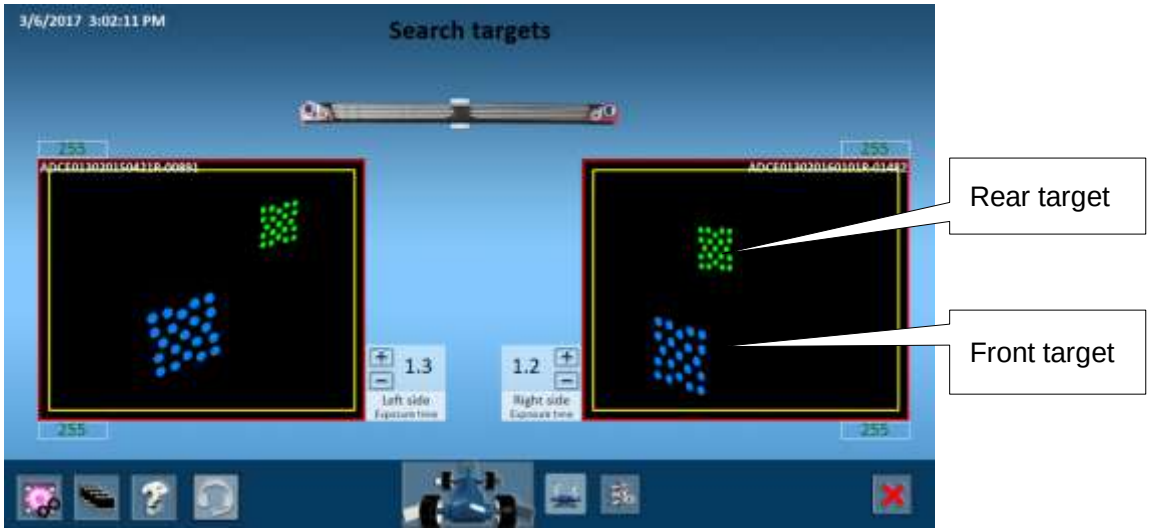
2.2 Camera cross beam and targets position

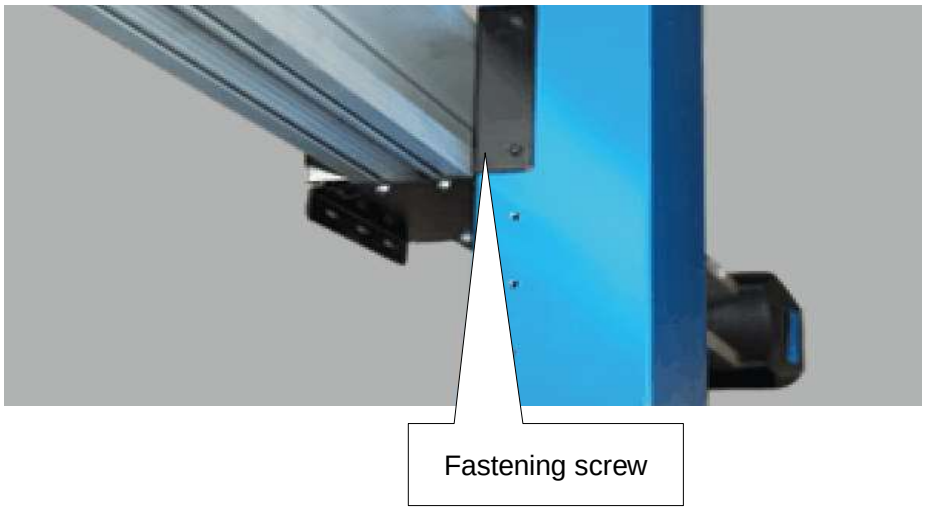
2.2.1 Fixed type

After fixed type wheel alignment and lift installation, drive a car on the lift, install clamp and targets, then raise up the lift to the proper position that is suitable for operation.

Loosen the fastening screw, run software program, enter “search target” screen to adjust the targets position by moving the camera cross

beam position. When the front targets are blue and rear targets are green means the current working position is correct, then lock the fastening screw.

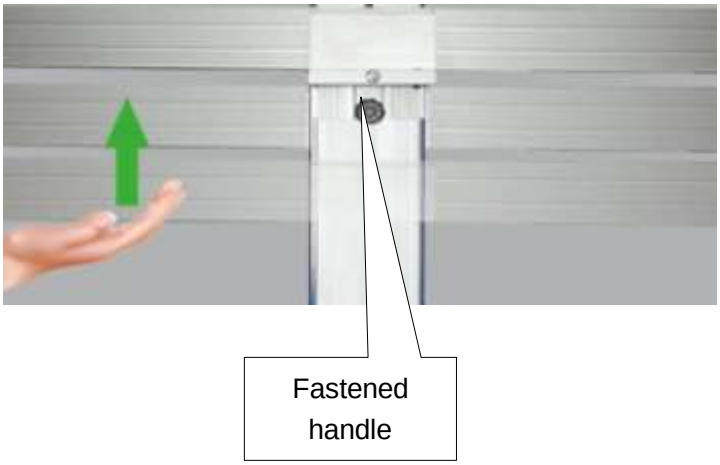




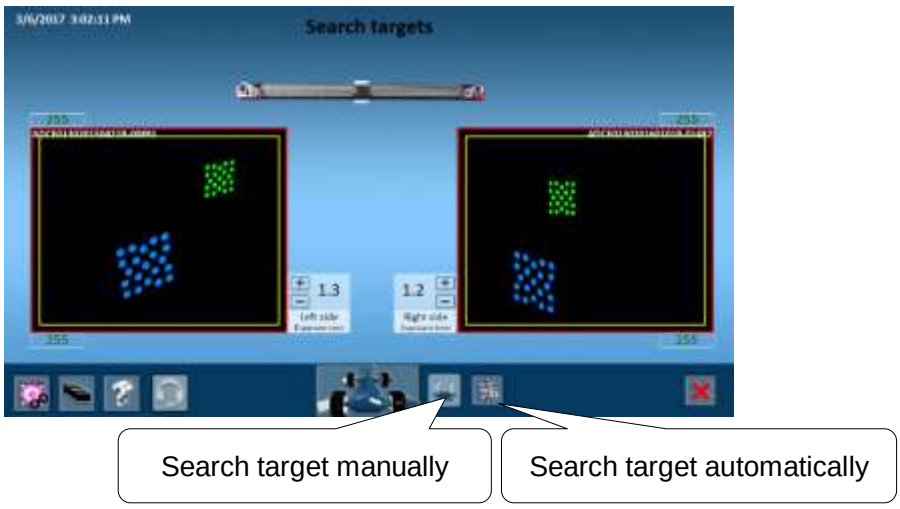
2.2.2 Manually lifting type

After manually lifting type wheel alignment installation, make sure camera cross beam move up and down smoothly, loosen fastened handle,

adjust camera cross beam position.



Manually lifting type can confirm the position by moving camera cross beam before measurement, also can click “search targets manually” on search targets screen in the software program.



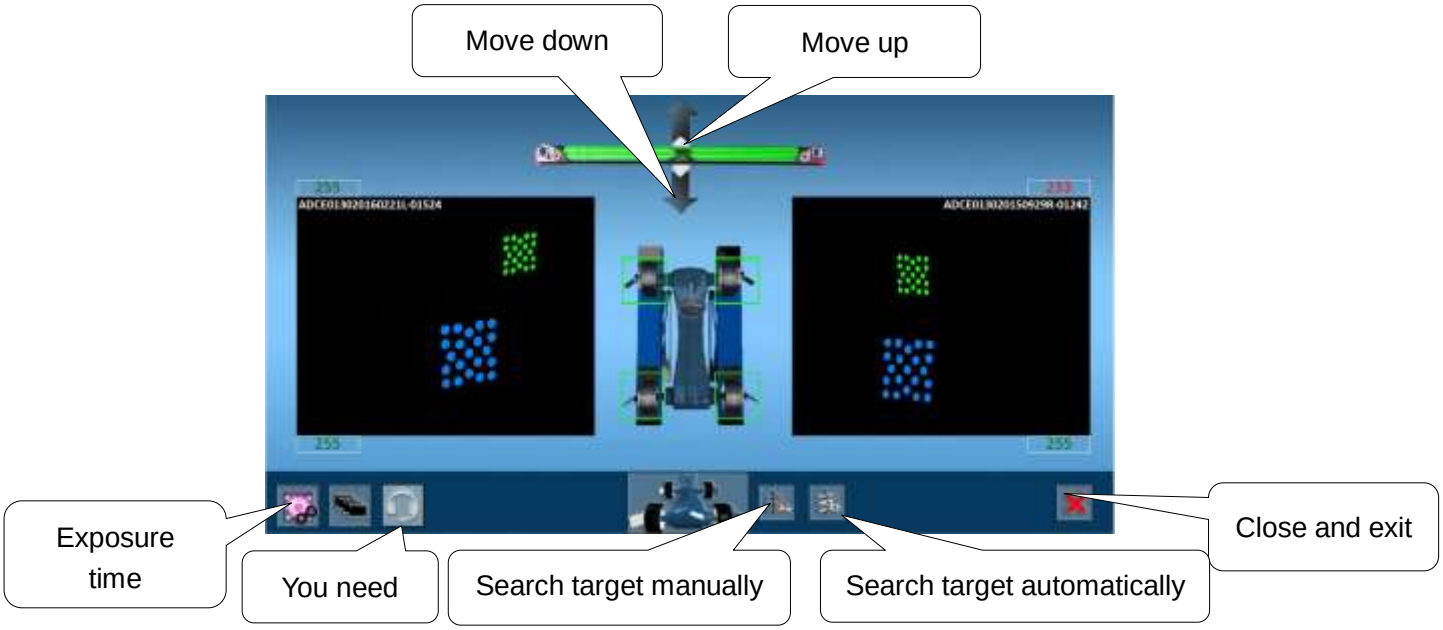
2.2.3 Automatically lifting type

Equipment can be used directly after installation.

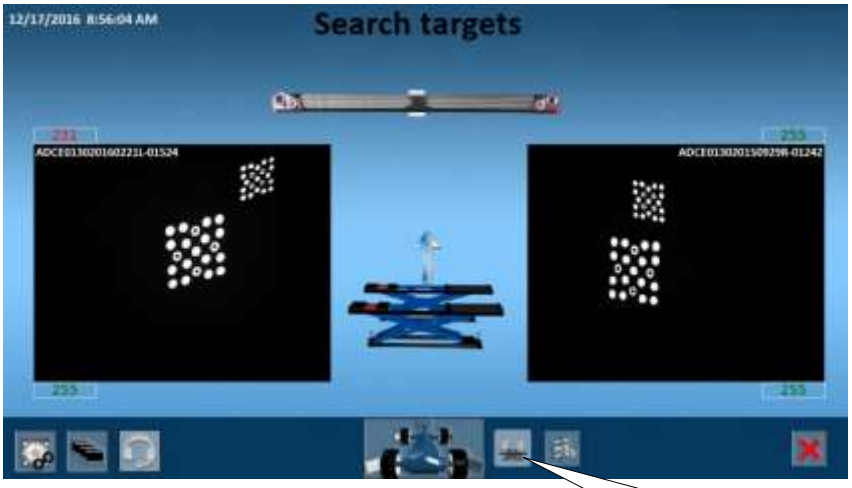
In the software program search target screen, when operator click “search target automatically” button, camera cross beam can move up and

down automatically to find the targets and stop at the correct working position.

Operator also can press the up and down key on the keyboard to control the camera cross beam up and down, or use mouse to click the arrow on the screen to control.

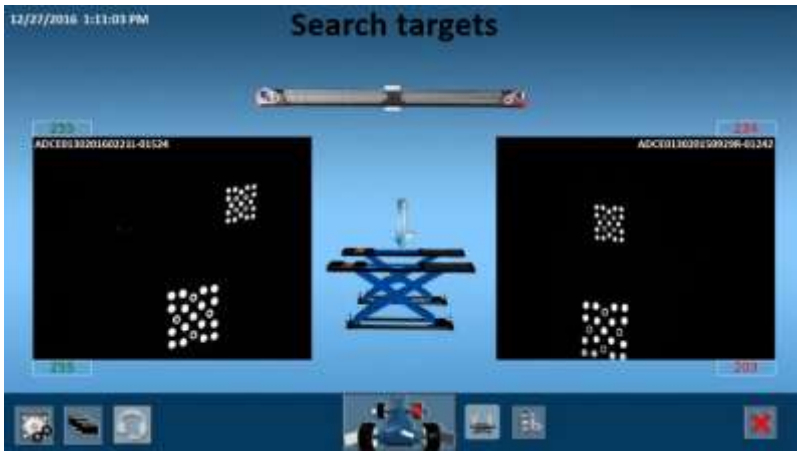


If operator doesn’t know how to adjust lift to be suitable for camera cross beam position, operator can enter “search target” screen like below, the animation indicate lift moving direction, the camera cross beam will become green when position is correct and skip to next screen.

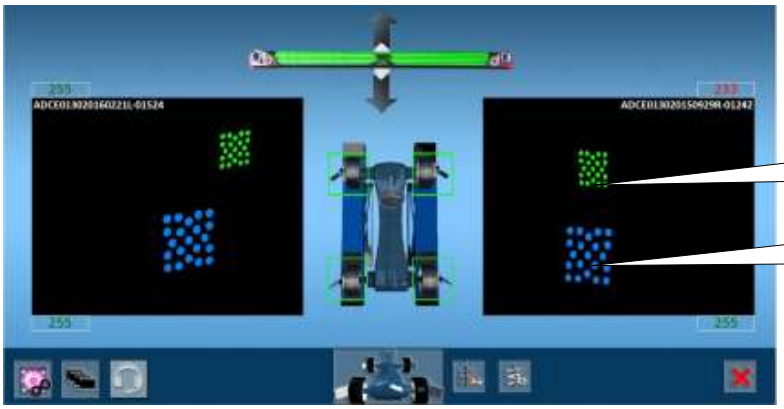


Lift move up indication

Lift moving indication



Lift move down indication



Rear targets

Front targets

Lift position is correct

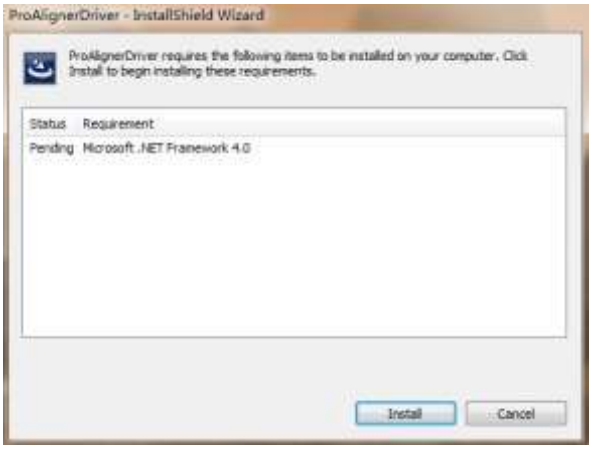
2.3 Software program installation

2.3.1 Alignment software program include driver program and software program

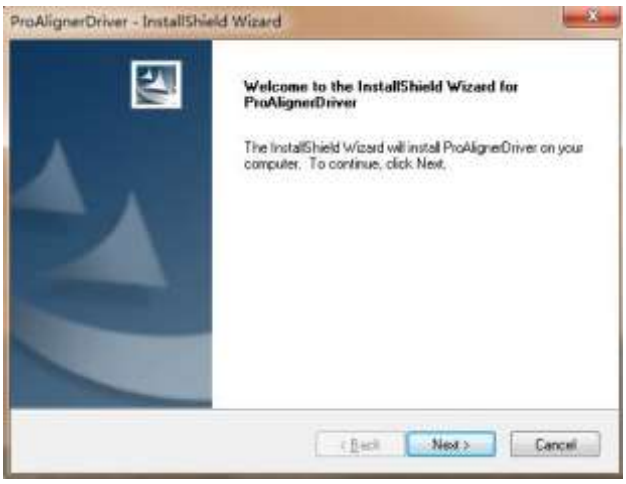
First, we need to check the PC's operation system is WIN7 or WIN10. If the operation system is WIN7,we need to install drive program. If the operation system is WIN10， drive program doesn't need to be installed.

2.3.2 WINDOWS7 driver program installation

Step 1: Double click "win 7 3D setup1.exe" program

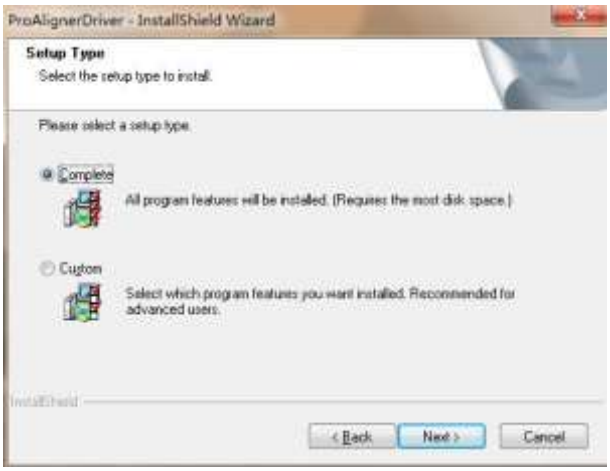


Step 2: Click "Install" button

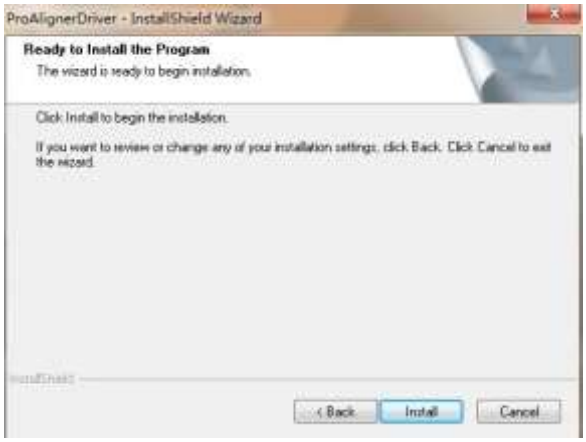


Step 3: Click “Next” button to continue to install.

Step 4: Input “User name” and “Company name” and then click “Next” button to continue to install.



Step 5: Click “complete” option and then click “Next” button to continue to install.

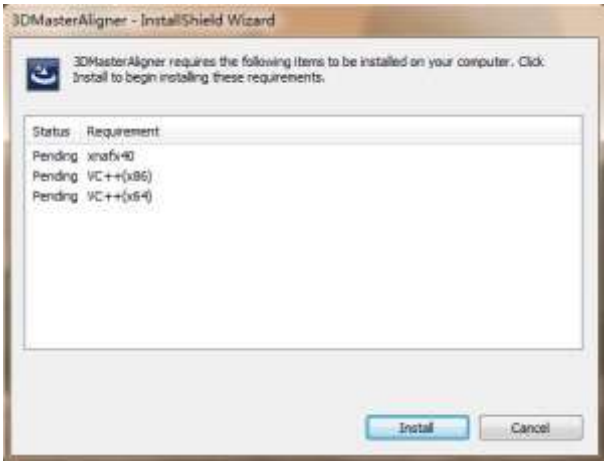


Step 6: Click “Install” to start installation.

Step 7: Click “ Finish” , the installation is finished.

2.3.3 Wheel alignment software program installation

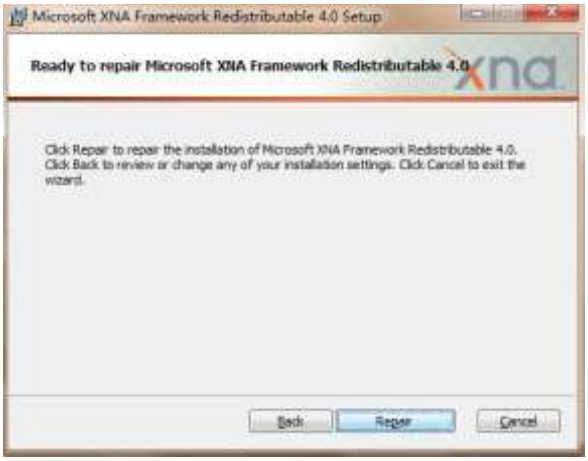
Step 1: double click “3DAlignerARK.exe” to install.



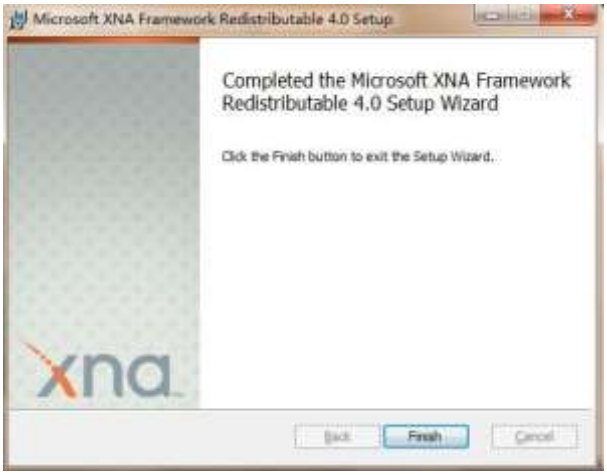
Step 2: click “Install” to start the installation.

Step 3: Click “Next” to continue to install.

Step 4: Select “Repair” option and then click “Next” to continue to install.

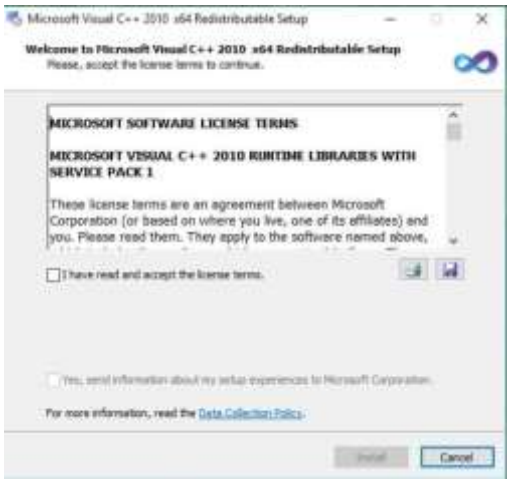


Step 5: Click “Repair” to continue to install.

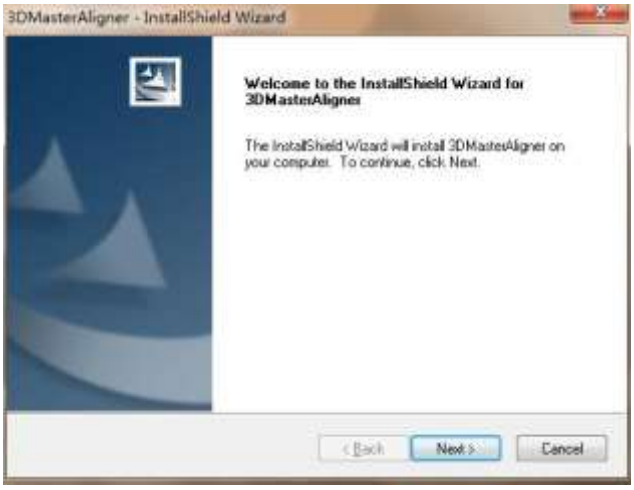


Step 6: Click “Finish” and continue to install.

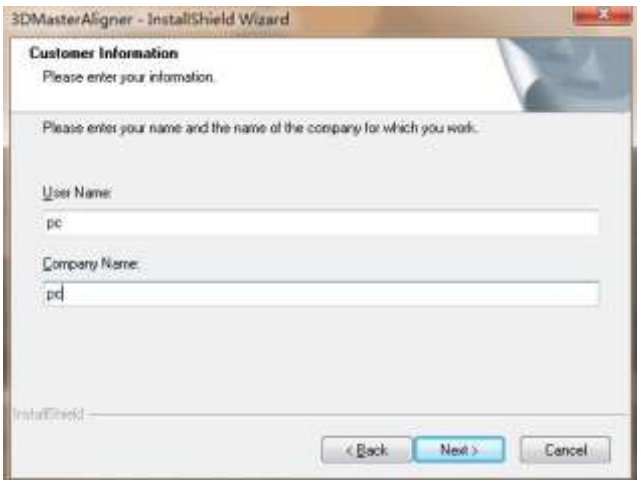
Step 7: Click “Finish”, repair is finished.



Step 8: Click “cancel” button and continue to install.

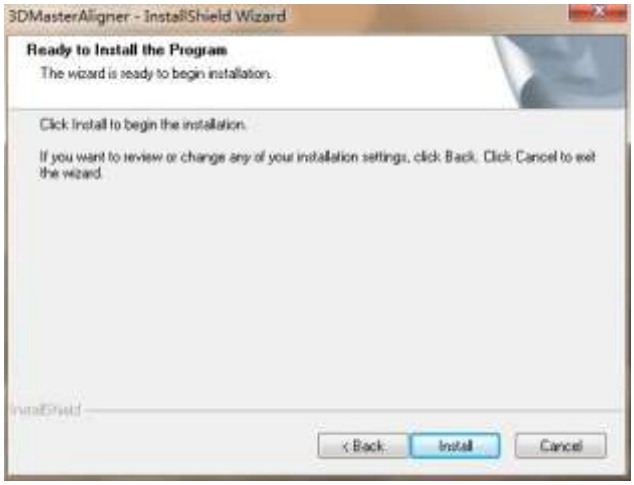


Step 9: Click “Next” button and continue to install.

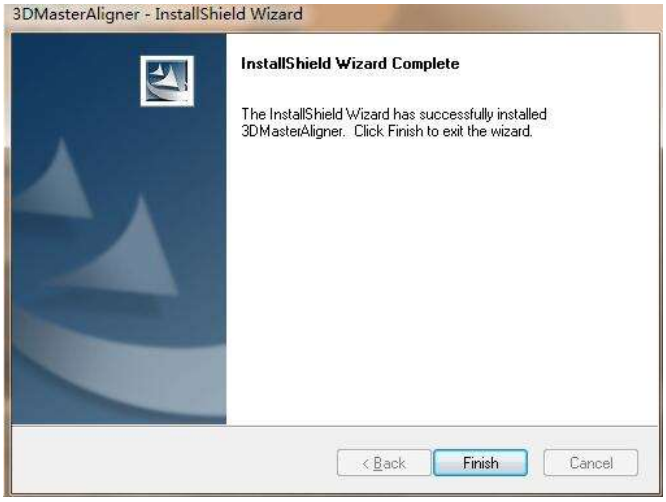


Step 10: Input “User name” and “Company Name” and click “Next” to continue to install.

Step 11: Select “complete” option and click “Next” to install.



Step 12: Click “Install” to start installation.



Step 13: Click “Finish” button, the installation is finished.

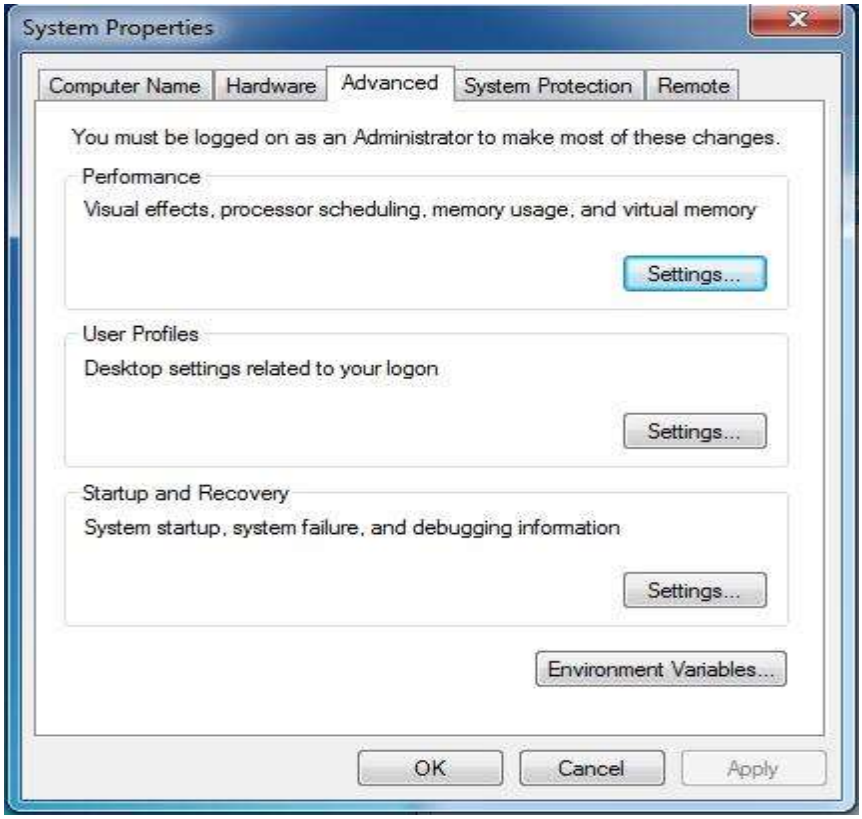
2.4 Camera driver installation

Important indication: it must make sure the two cameras connect with main control board correctly, also has power.

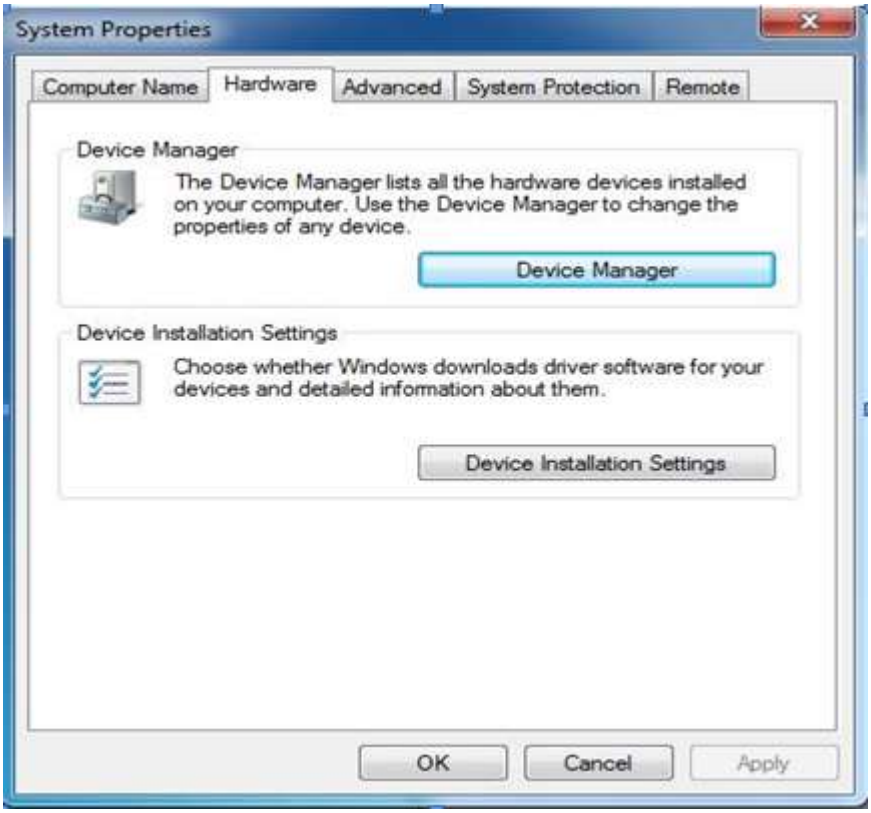
(1) Choose “Computer”, right click to choose “Properties” from the menu list.

(2) Click “Advanced system settings”.

(3) Click “Hardware”



(4) Click “Device Manager”



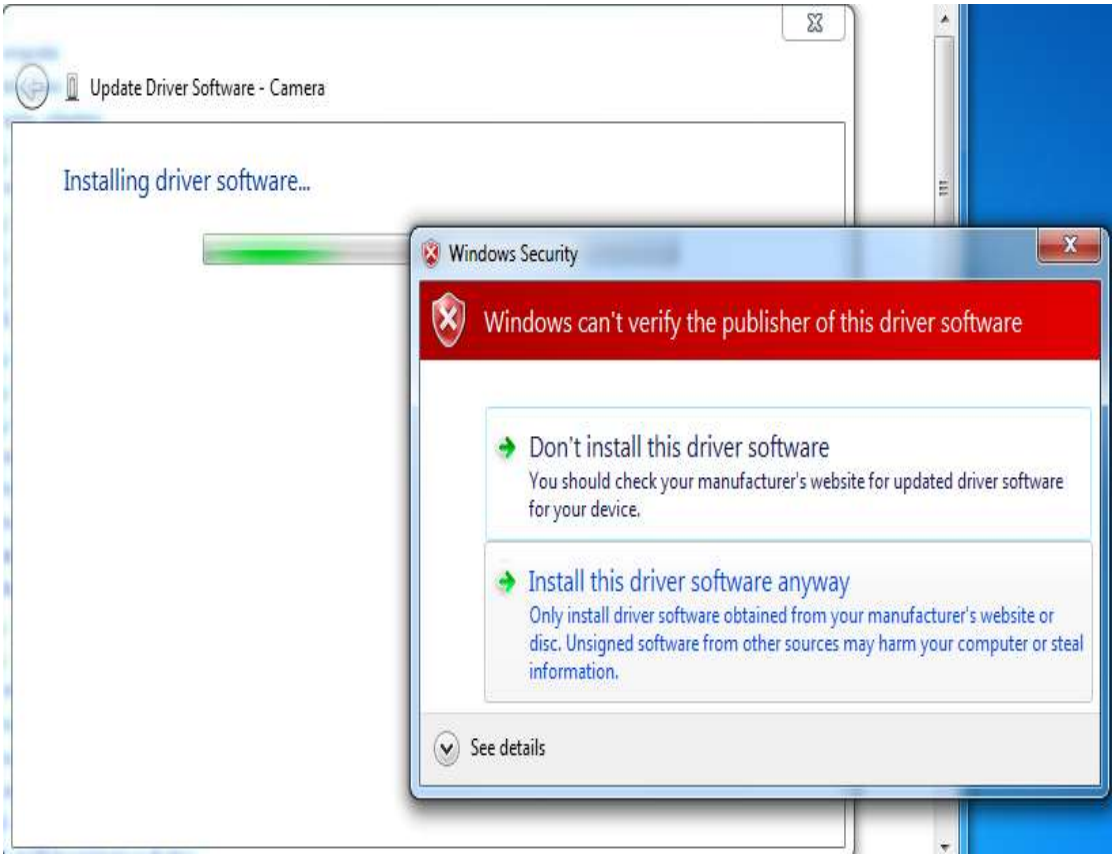
(5) You can see two “Camera” in “Other devices” item (yellow note: it indicates to install the device driver)

(6) Choose the first Camera and right click, choose “Update Driver Software…” from the menu list.

(7) Click “Browse my computer for driver software”

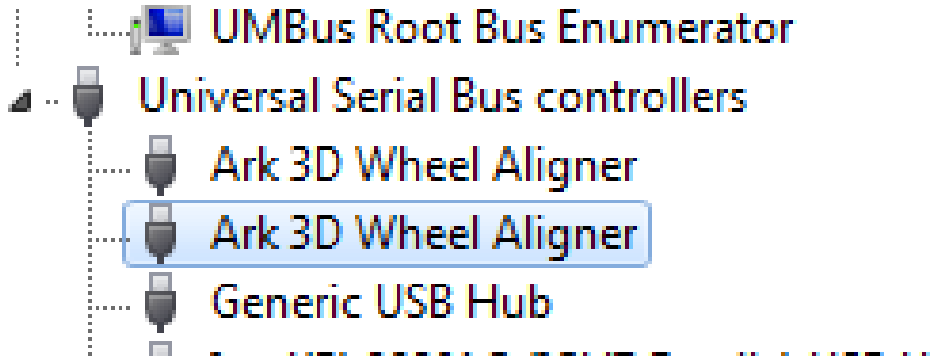
(8) Click “Browse” to choose “C:\3DAligner\InstallCom\camera”

(9) Click “Install this driver software”



(10) Repeat the above procedures to install the second Camera driver.

(11) When the 2 cameras install correctly, it will display as below photo.



Chapter 3 Preparation Before Alignment

3.1 Install clamps and targets

After equipment installation, the operator needs to install the targets and clamps according to below ways.

3D Clamp

3D front target

3D rear target

3.1.1 Targets installation

Front targets installation

Rear targets installation

When operator install clamps and targets, insert the locating pin of the targets in the groove of clamps(see red arrow indication on below photo), let the targets incline about 5 degree to vehicle head direction. Make sure the targets are locked on the clamps.

3.2 Confirm the cameras and targets position

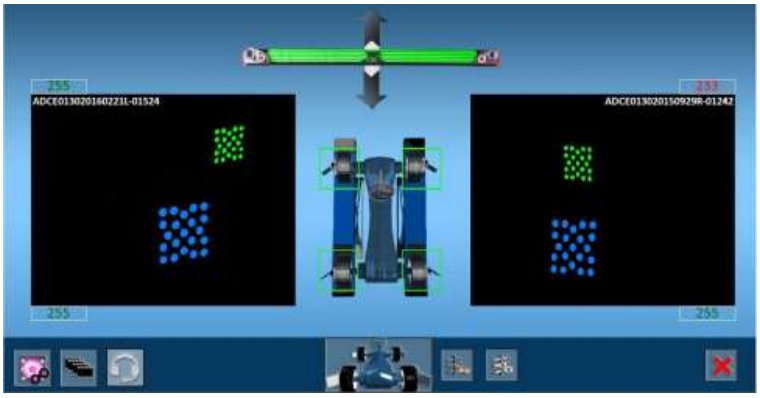
Fixed camera cross beam: after the equipment installed, it need to

confirm the cameras and targets relative position, make sure the four targets all in the camera view filed. Or will affect the measurement precision.

Automatic lifting camera cross beam: the camera will trace the targets automatically, and camera beam will follow the targets to adjust the correct position. It also can adjust through keyboard or mouse.

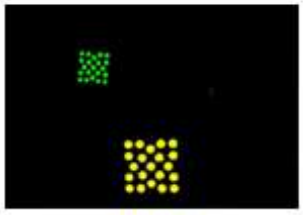
3.2.1 Targets status

On the targets searching screen, operator can judge the targets in the correct camera view field or not by the targets color in the image. Blue and green means the targets on the correct position and in the camera view field; yellow means the targets on the edge of camera view field and out of measurement range, the targets position need to adjust; red means the targets totally out of camera view field, and out of measurement range, the targets position need to adjust. If the targets install correctly, the front targets in the image is blue, and rear targets in the image is green. See below photos for reference.



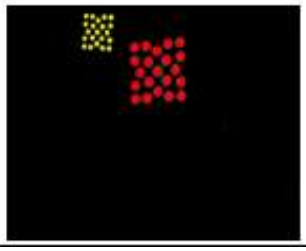
targets install correctly situation

front and rear targets both correct



front target on the edge

front target out of camera view



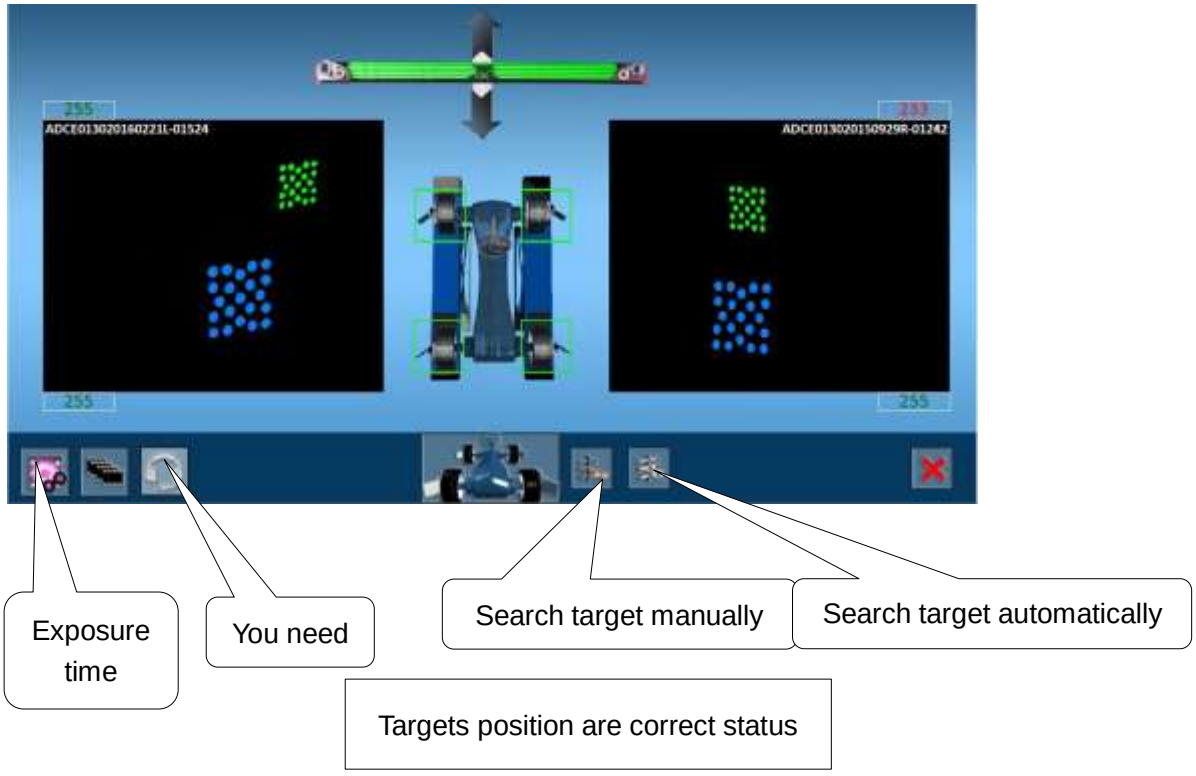
rear target on the edge

rear target out of camera view

front targets on the rear targets area

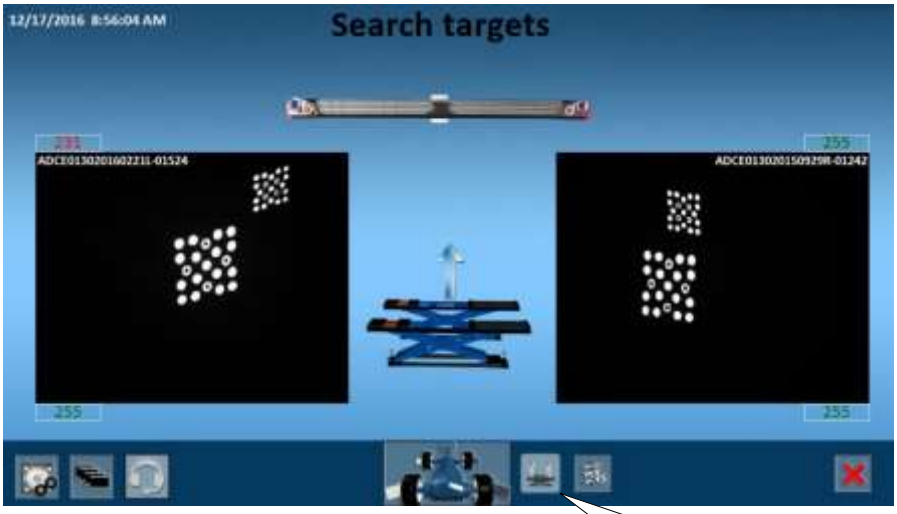
3.2.2 How to confirm the targets and camera relative position of fixed and manual type alignment by software

Fixed camera cross beam: after installing the 3D wheel alignment equipment and lift, drive a car on the lift, then install the clamps and targets. Raise the lift height to the proper position and lock it. Unlock the fixed screws on the stand column, run the software program to target searching screen, and then adjust the camera beam position according to the targets image on the screen. When you see the front targets are blue and rear targets are green means the camera beam position is correct, and then lock the fixed screws on the stand column to fix the camera beam.



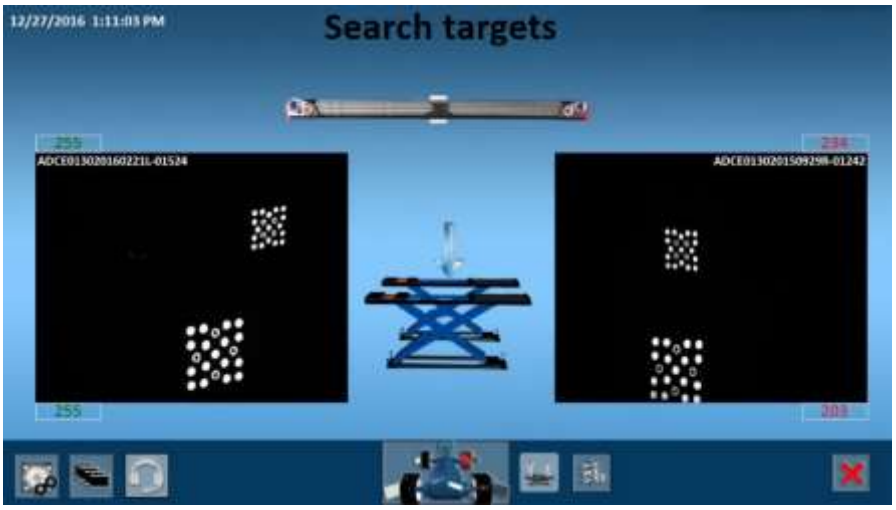
If the customer doesn't know how to adjust the lift to be suitable for

camera beam position, it can click the “search targets” button. The animation on the screen indicate the lift moving direction, so the operator can adjust the lift according to the animation till the camera beam on the screen turn green. Green means the position is correct, can begin to measure and exit the search targets screen.

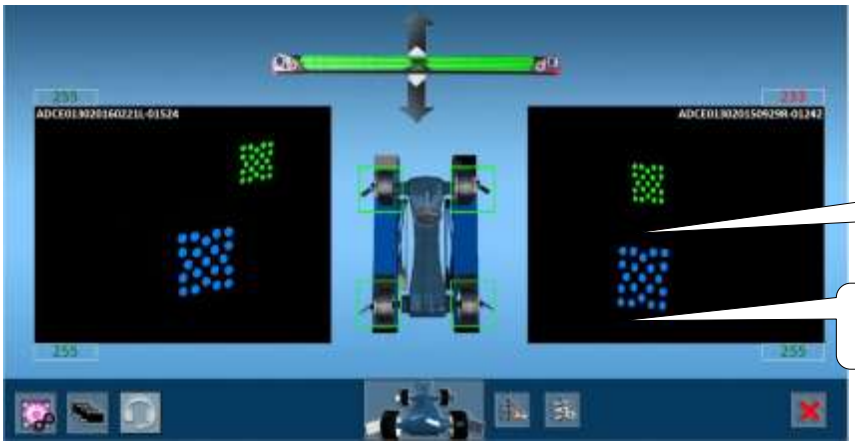


Lift move up

Lift moving indication

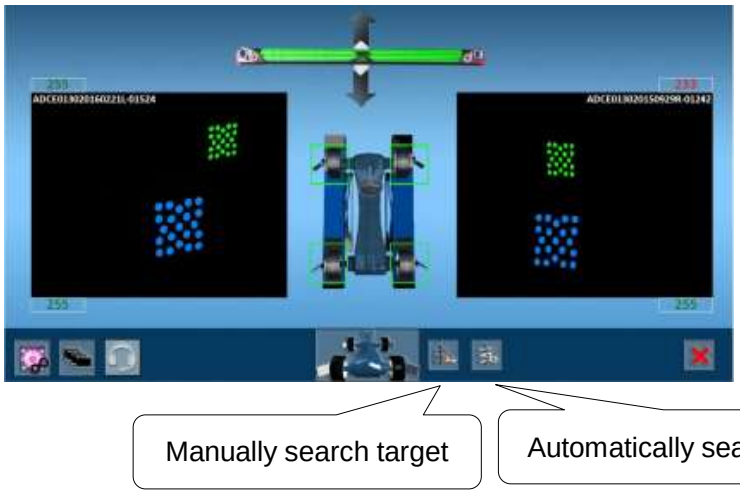


Lift move down



Lift position is correct

Manual lifting camera beam: Operator can adjust the correct position by moving the camera beam manually, also can click the “Manually Search Targets” button to adjust.

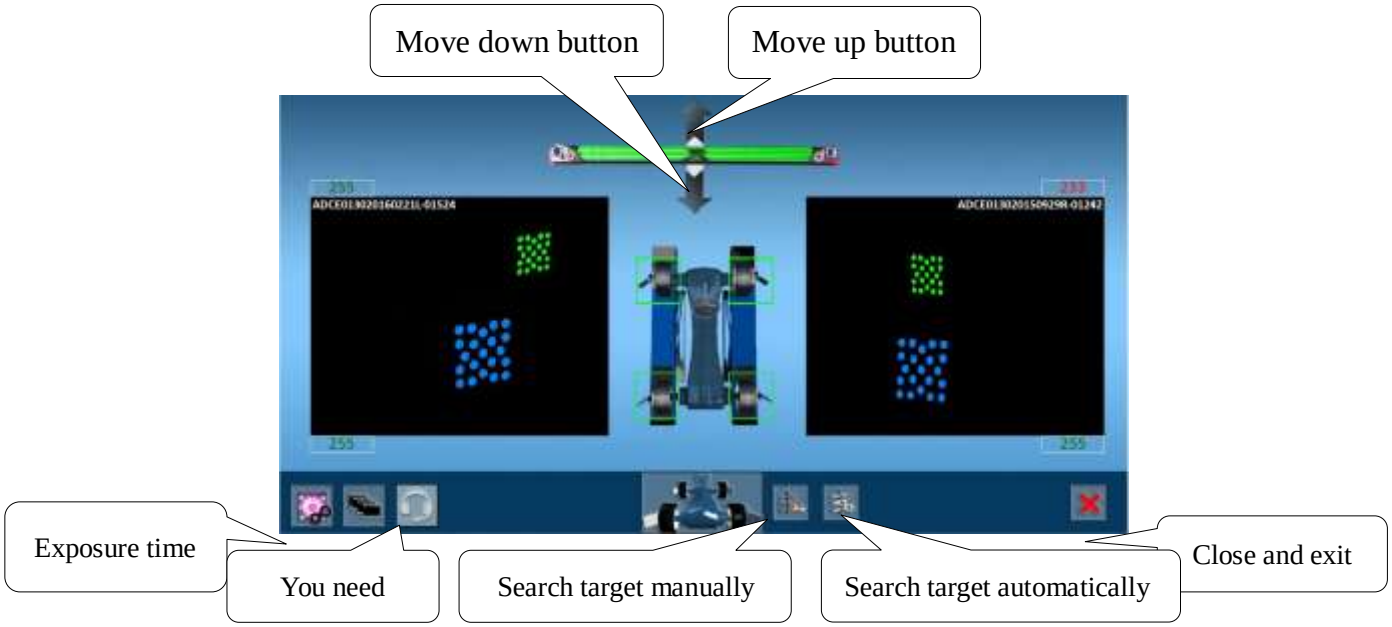


3.2.3 How to confirm the targets and camera relative position of automatic version alignment by software

Automatic lifting camera beam: the operator can use the wheel alignment machine after installation directly.

Click “Search Target” enter “Search Targets” screen, camera beam will trace the targets automatically to confirm the correct position after click

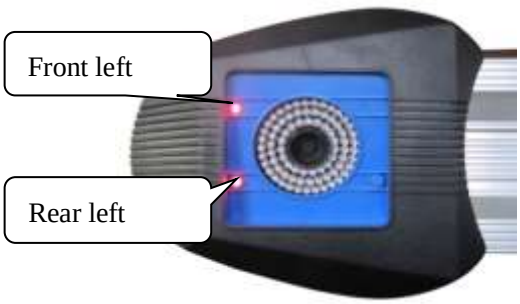
“Automatic Search Targets” button. Or the operator can press the “up ” and “down ” key on the keyboard to control the lift move up or down. Or can use mouse to click the “move up or move down buttons” on the screen to control the lift move up or down.



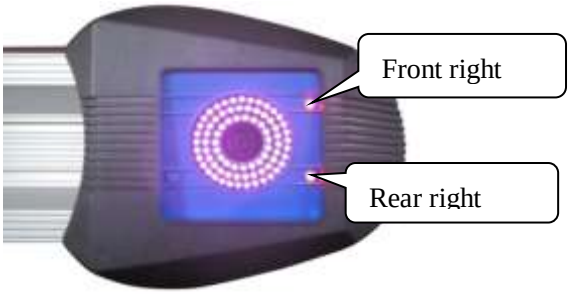
3.3 Camera beam indicator explanation

3.3.1 Series 1 indicator explanation

The LED indicators on the camera beam represent the four targets status. Four LED indicators in red means the targets are stopped or immobile, if the LED indicator is red flickering means the corresponding target is blocked or fault.



Left camera



Right camera

The upper LED indicator on the left and right camera is red and underneath LED indicator is green flickering means push the vehicle to tail direction.

The underneath LED indicator on the left and right cameras is red and upper LED indicator is green flickering means push the vehicle to the head direction.


The two LED indicators on left camera both red, upper LED indicator on the right camera is green flickering and underneath is red means turn the steering wheel to the right direction.

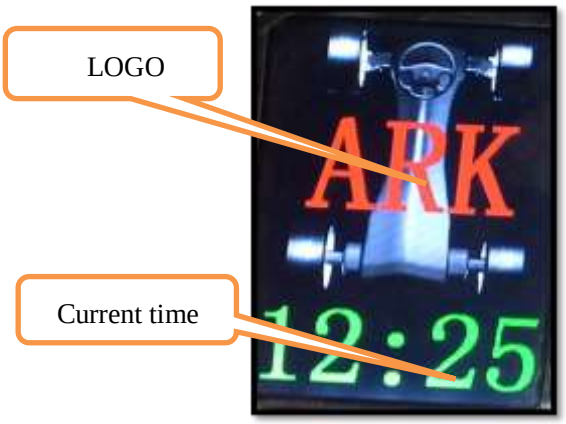

The upper LED indicators on the left and right camera both green flickering means the steering wheel is in the middle position.


The two LED indicators on the right camera both red, upper LED indicator on the left camera is green flickering and underneath is red means turn the steering wheel to the left direction.

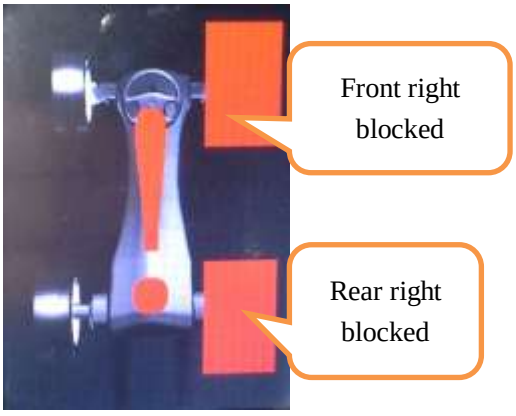
The upper LED indicators on the left and right camera is green flickering means the steering wheel turn to the middle position.

3.3.2 Series 3 LCD indications explanation

Left camera of series 3



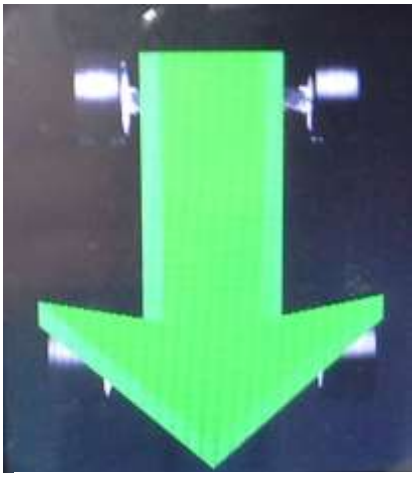
LCD screen



Block or targets can't be recognized

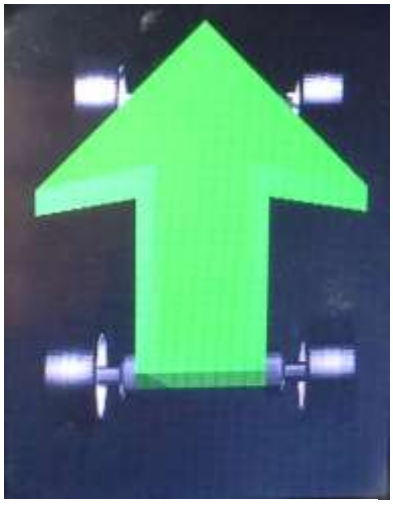
Camera beam moving up

Camera beam moving down



Push vehicle to the tail direction indication

Stop pushing, waiting indication



Push vehicle to the tail direction indication

Turn the steering wheel to the left indication

Turn the steering wheel to the center position indication

Turn the steering wheel to the right indication

Camera fault indication

KPI and Caster Adjustment values on camera

FL and RL TOE adjustment values on right camera

FR and RR TOE adjustment values on right camera

3.4 Vehicle Check

The vehicle needs to do below checks before alignment:

1. Wheel rim must match the tire and size is same.

2. If the tire pressure is same, if tread pattern is good.

3. Suspension system condition.

4. The gap between gear and steering lever.

5. Wheel rim offset.

6. Load weight correctly.

7. Shake vehicle to let the suspension back to correct position.

8. Make sure the pins of turntable and slide slip insert correctly. The pins can’t take out until the vehicle drive on the turntable and slide slip.

9. Install the pedal locker correctly.

3.5 Install clamps

Install the clamps and targets on the wheel rim.

Turn the center knob of the clamp to adjust its size to be suitable for rim.

Make sure the 4 claws of the clamp stick to the wheel rim closely. Turn the knob of the clamp to fix it on the wheel tightly.

Note!

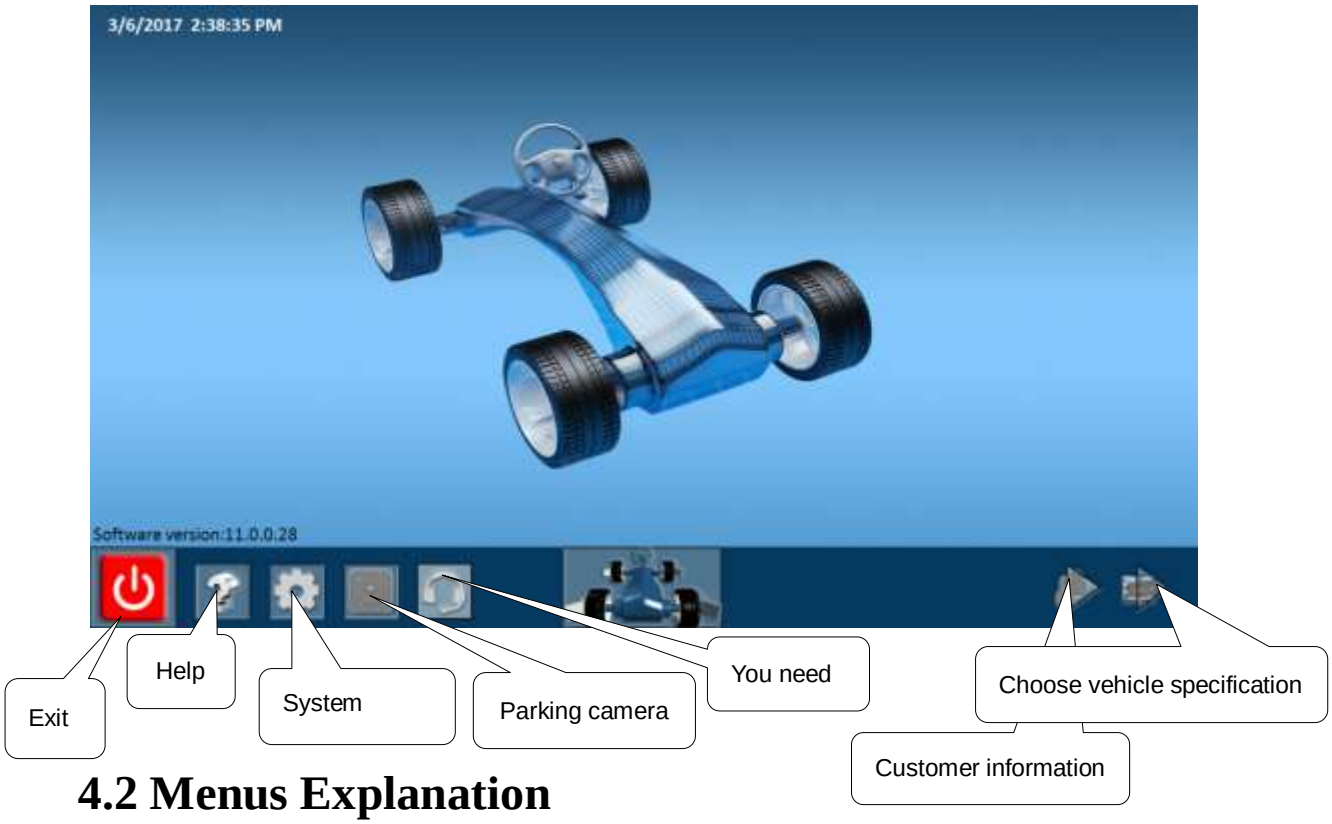
Four wheel alignment measurement: it needs to install four targets (two front targets, two rear targets).

Two wheel alignment measurement: it only needs to install two front targets.

Chapter 4 Software Program Homepage and Menus

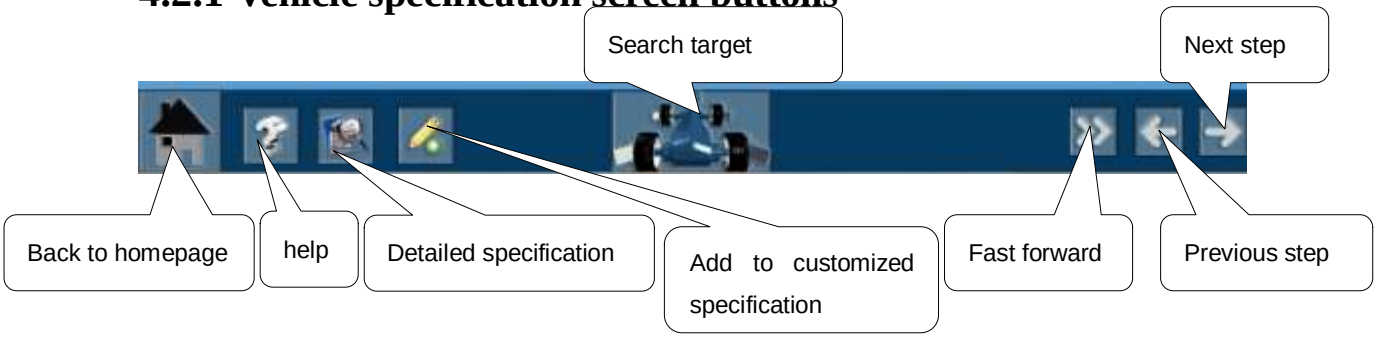
4.1 Homepage

Software program homepage is the beginning of measurement, operator can begin to measure after choosing new vehicle specification or after entering customer information.

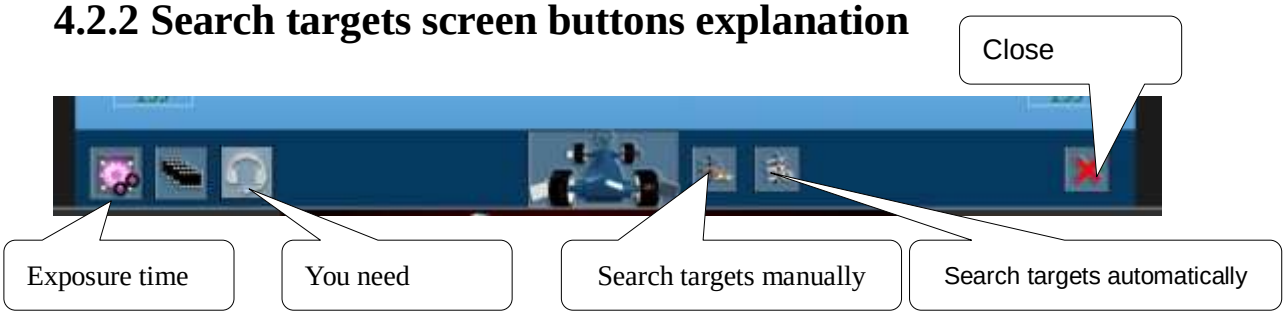


4.2 Menus Explanation

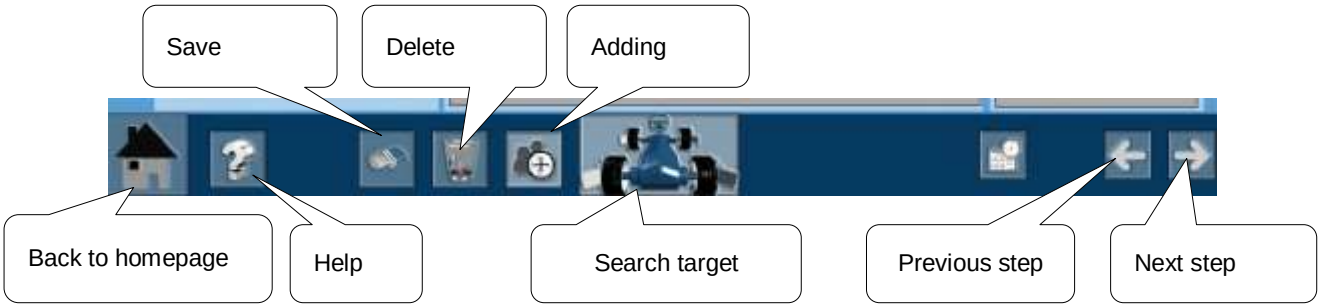
4.2.1 Vehicle specification screen buttons



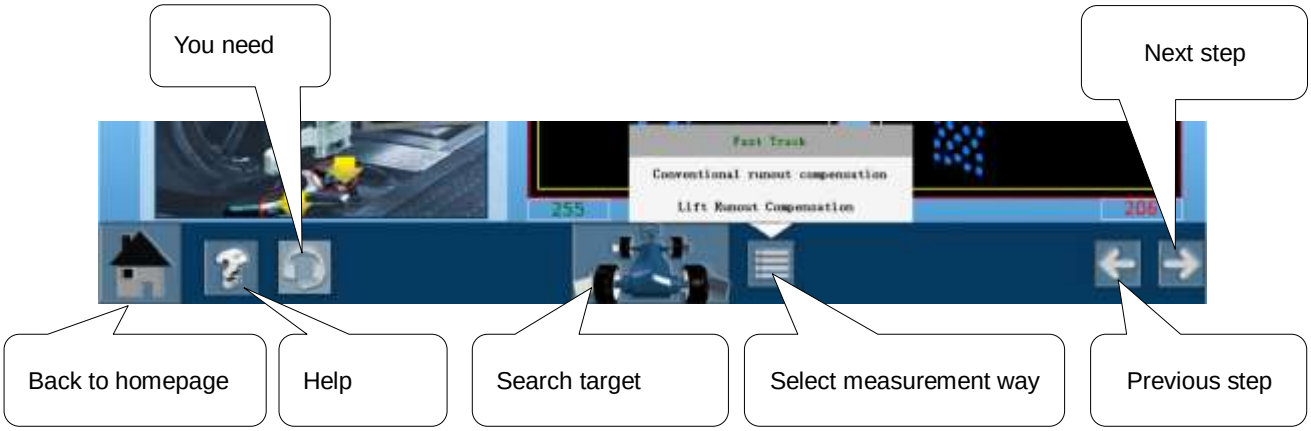
4.2.2 Search targets screen buttons explanation



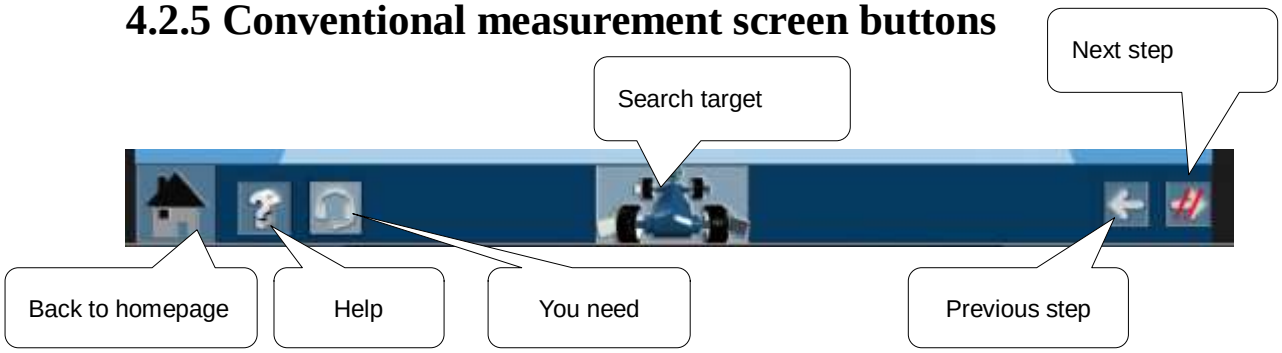
4.2.3 Input customer information screen buttons



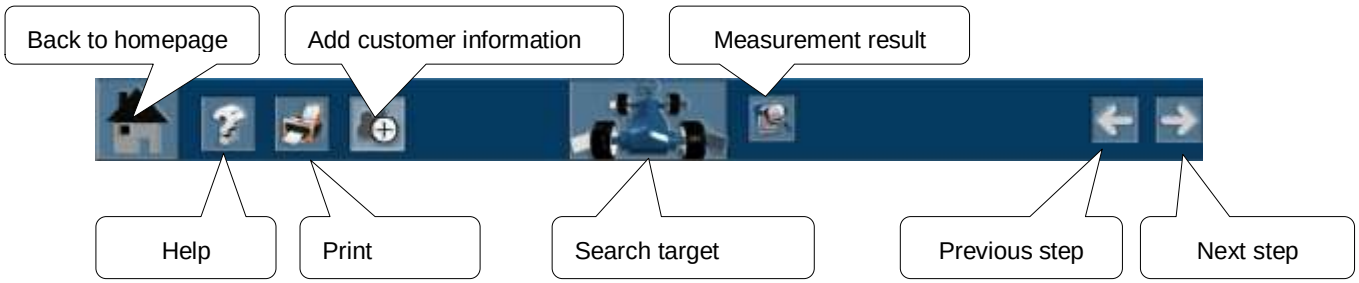
4.2.4 Preparation before measurement



4.2.5 Conventional measurement screen buttons

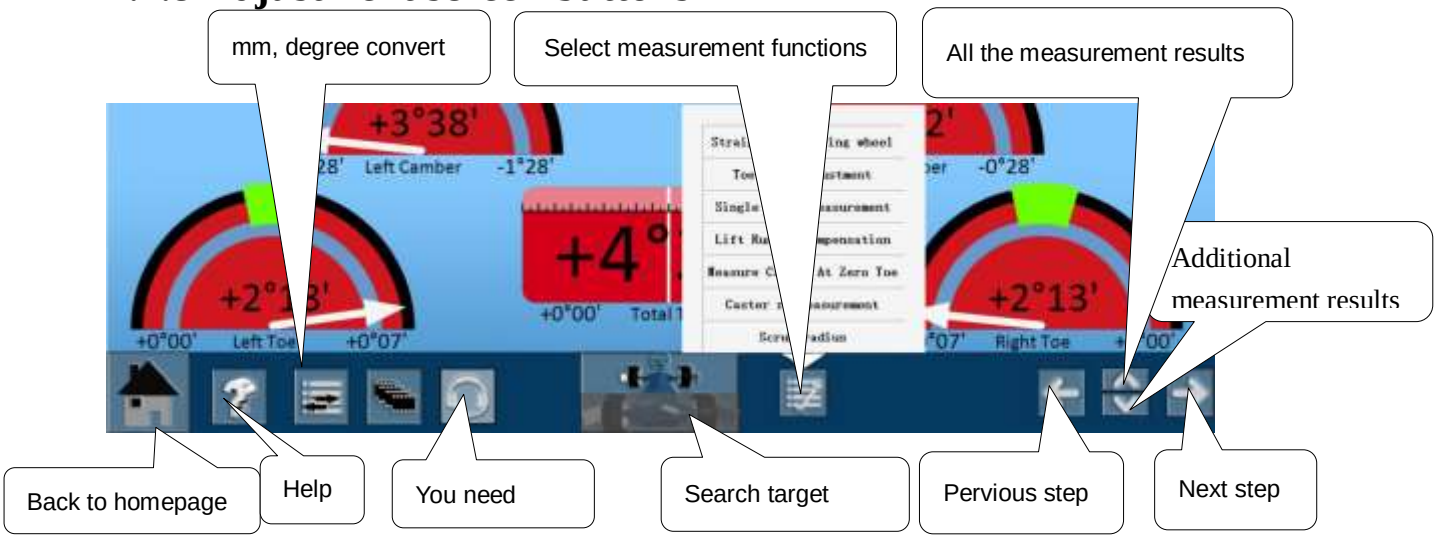


4.2.6 Report before adjustment screen buttons



4.2.7 Measurement results screen buttons

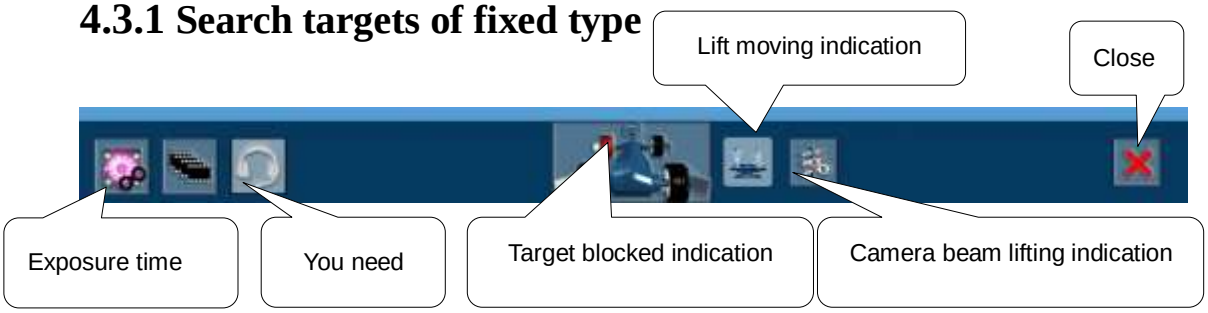
4.2.8 Adjustment screen buttons

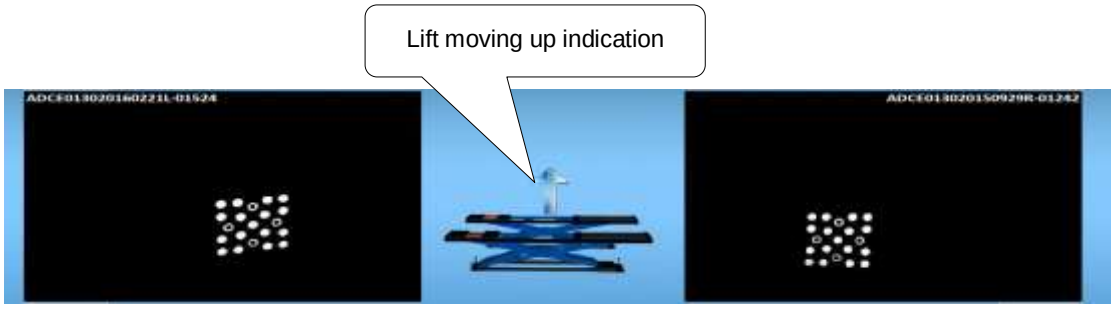


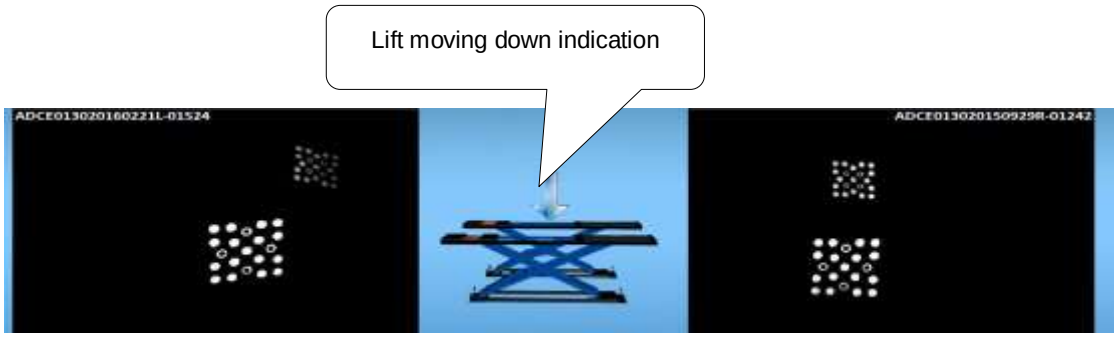
4.2.9 Straighten steering wheel of two wheel alignment measurement

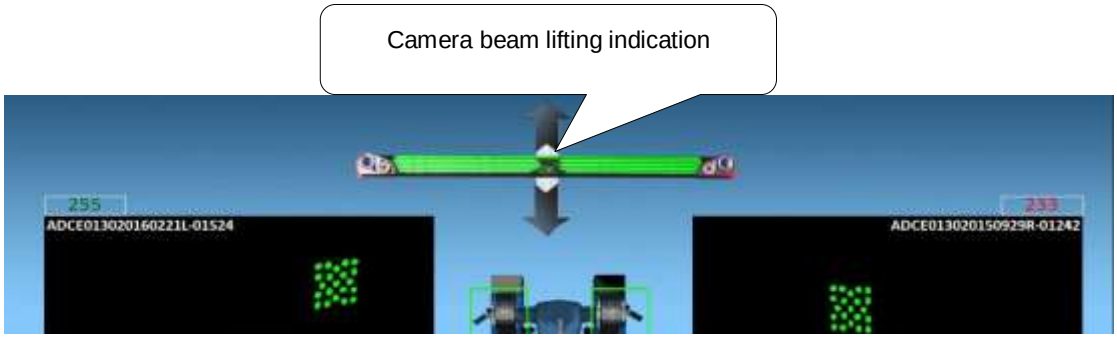
4.3 Search targets screen buttons explanation

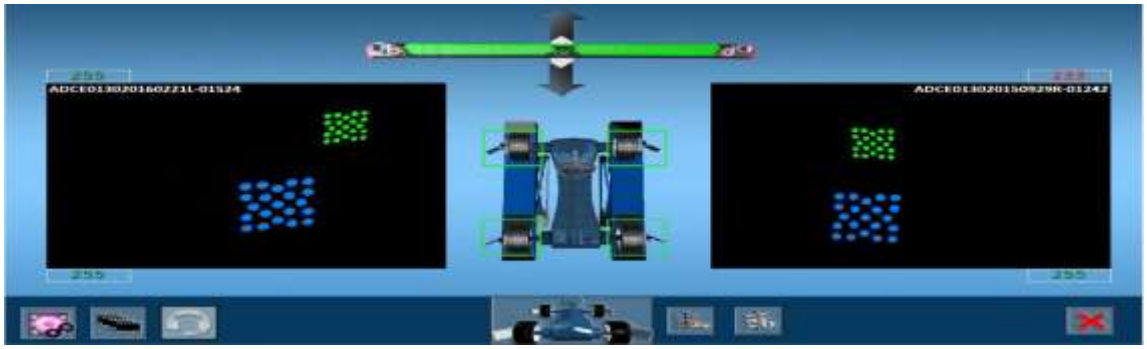
4.3.1 Search targets of fixed type





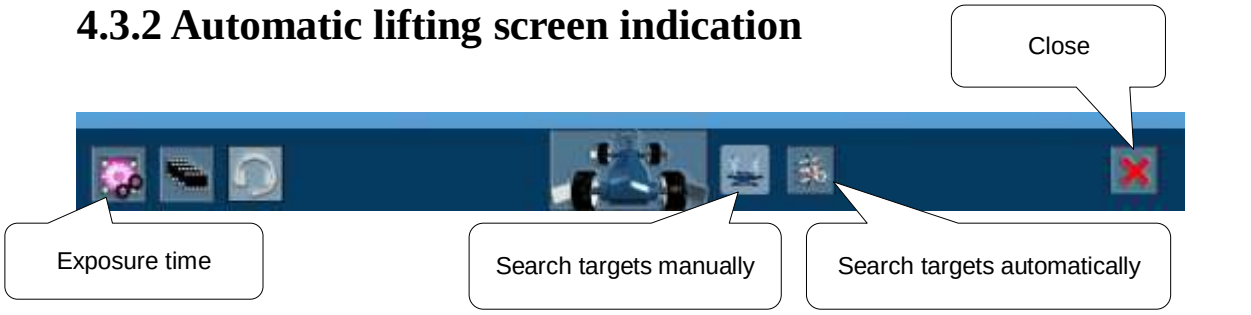






Search targets successfully

4.3.2 Automatic lifting screen indication



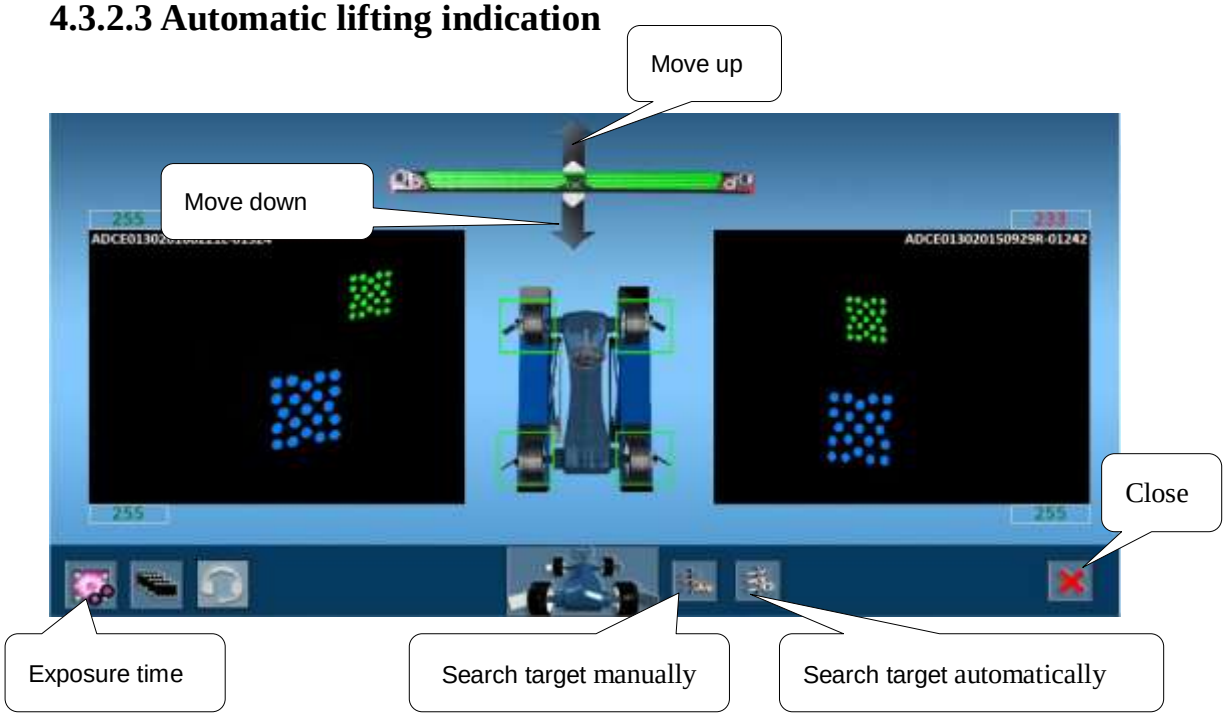
4.3.2.1 Control camera beam lifting by keyboard

Operator can press the up and down key on the keyboard on “search targets” screen to control the camera beam moving up and down 

4.3.2.2 Control camera beam lifting by mouse

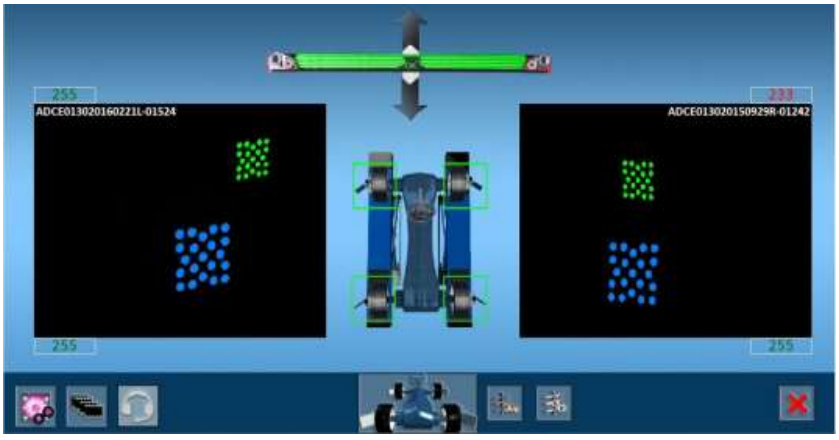
Operator can use mouse to click the up and down arrow on the search targets screen to control the camera beam moving up and down.

4.3.2.3 Automatic lifting indication



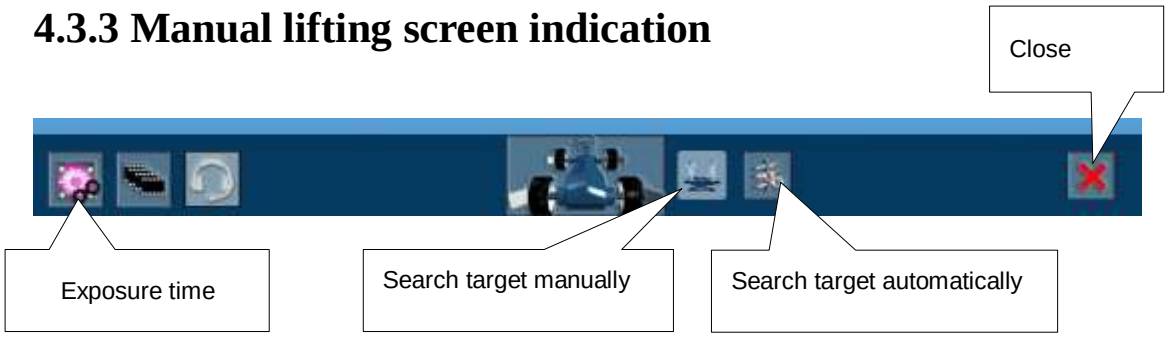
Camera beam move up

Camera beam move down



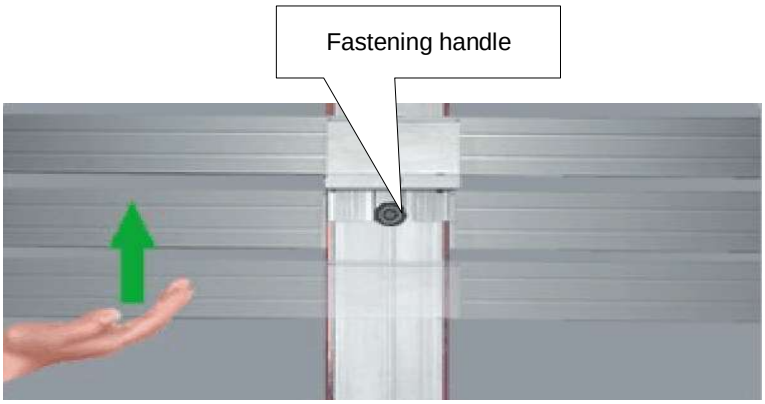
Search targets successfully

4.3.3 Manual lifting screen indication



4.3.3.1 Manual lifting indication

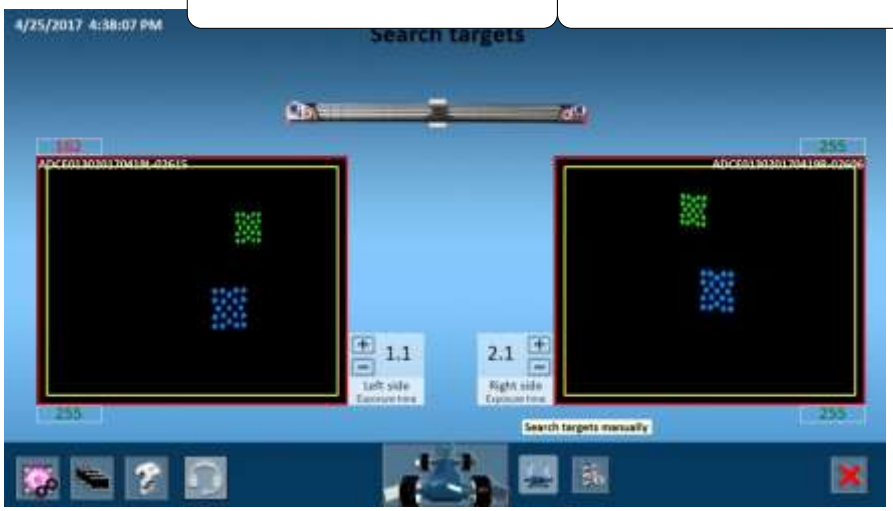
Manual lifting type's camera cross beam moved by hand after installation, loosen fastening handle to adjust the camera cross beam position.



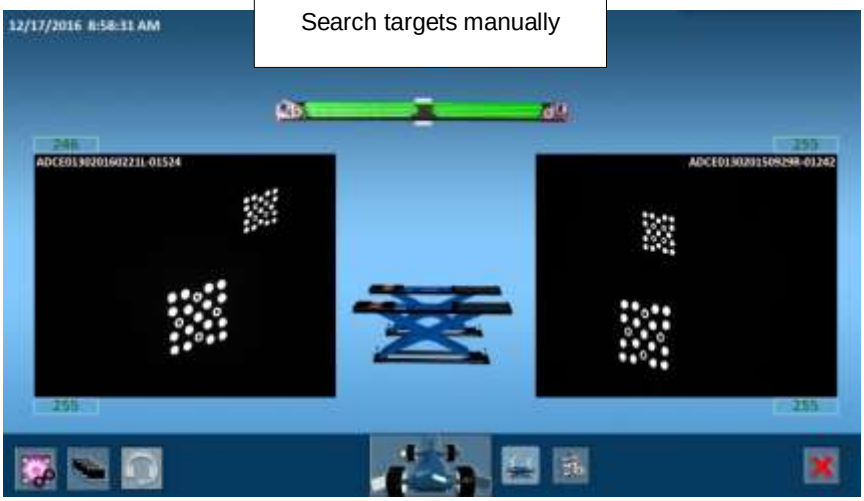
Manual lifting type's camera cross beam also can moved by clicking "search targets manually" button on the "search targets" screen.

Search targets manually

Search targets automatically



Search targets manually



Camera cross beam lifting to confirm target's position

Search targets successfully

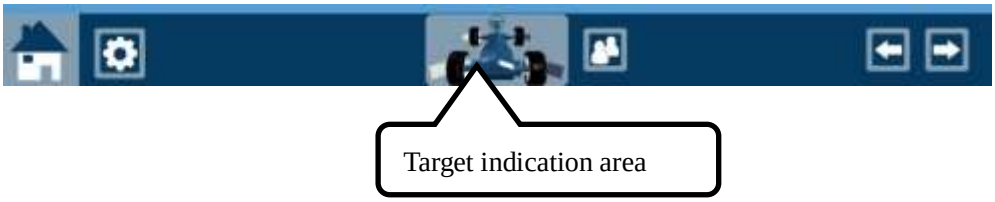
Adjust lift position, let it meet camera cross beam’s working height.

Lift move down

Lift move up

4.4 Target blocked indication

If the target is blocked during measurement, the wheel in the software program screen is in red color. See below photos for reference.



Targets are normal

Front left target blocked

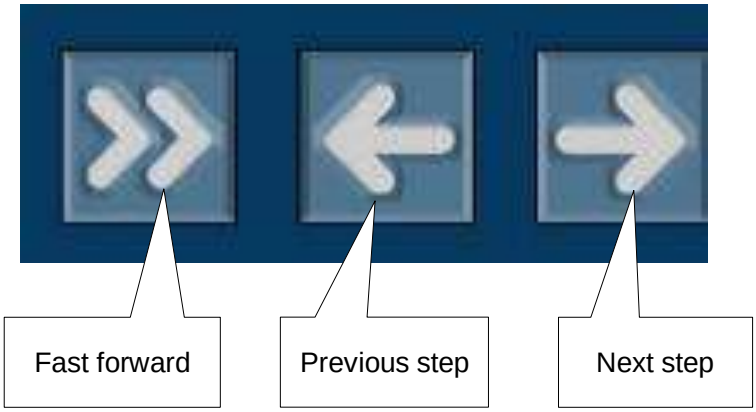
Front targets both blocked

Front and rear targets all blocked

4.5 Software program navigations indication

The operator can press the navigation buttons on the software screen to control next step or previous step, also can press the “left” and “right” keys on the keyboard to control next step or previous step.

4.5.1 Software screen navigation buttons

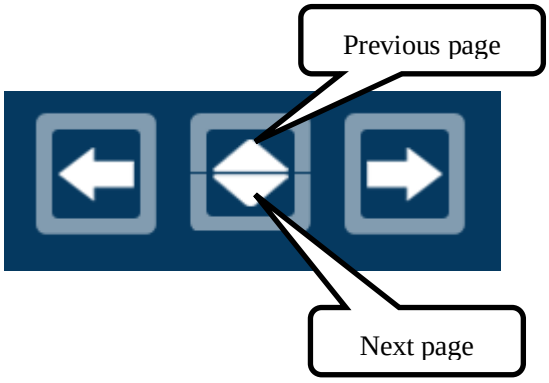


Previous step: back to previous screen.

Next step: continue to next screen.

Fast forward: the operator can skip “input customer information” screen after choosing vehicle specification and go to “preparation before measurement” screen directly.

After conventional measurement (push vehicle measurement), the operator can skip Caster measurement and go to straighten steering wheel screen directly.

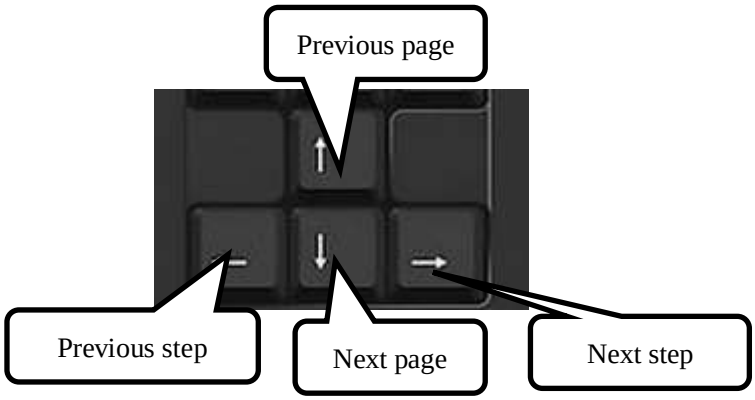


Previous page: on adjustment screen, click previous page can enter all the measurement values check screen.

Next page: on adjustment screen, click next page can enter individual angle adjustment screen.

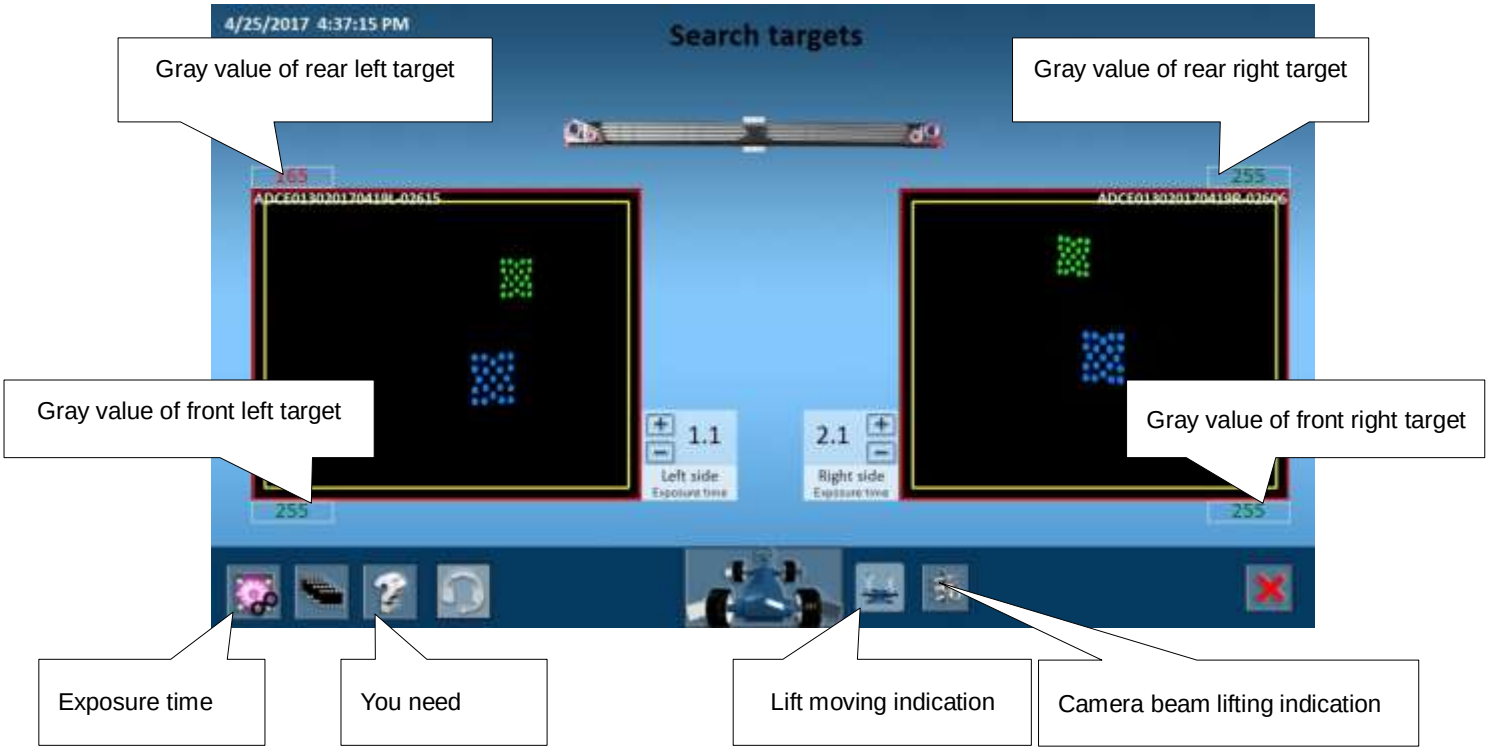
4.5.2 Keyboard navigation

The operator also can press the left and right key on the keyboard to carry out previous step and next step functions. Press up and down key to carry out previous page and next page functions.

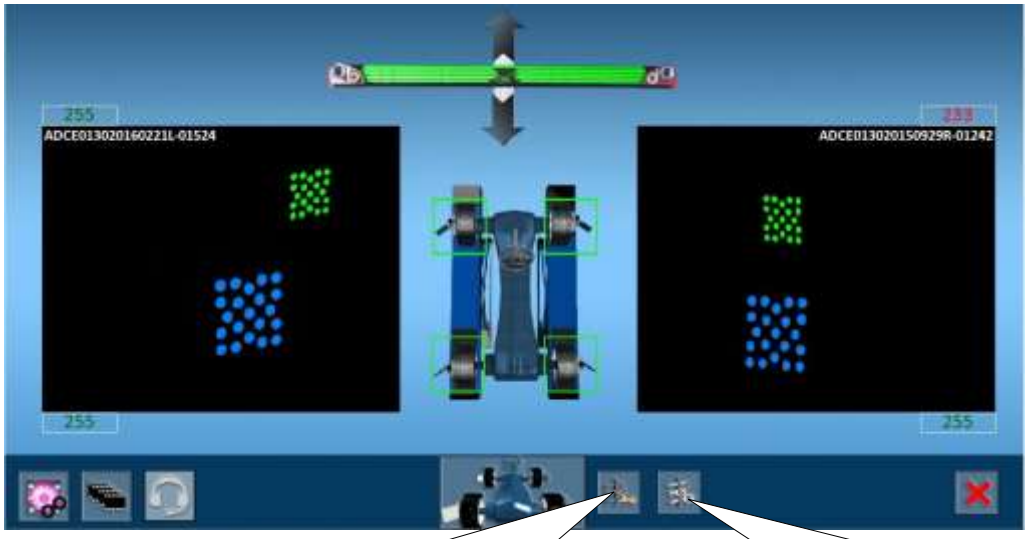


4.6 Search targets

The operator can enter “search targets” screen to check the targets status (position and gray value) when install equipment, or before measurement or during measurement.



Search targets screen of fixed type 3D alignment



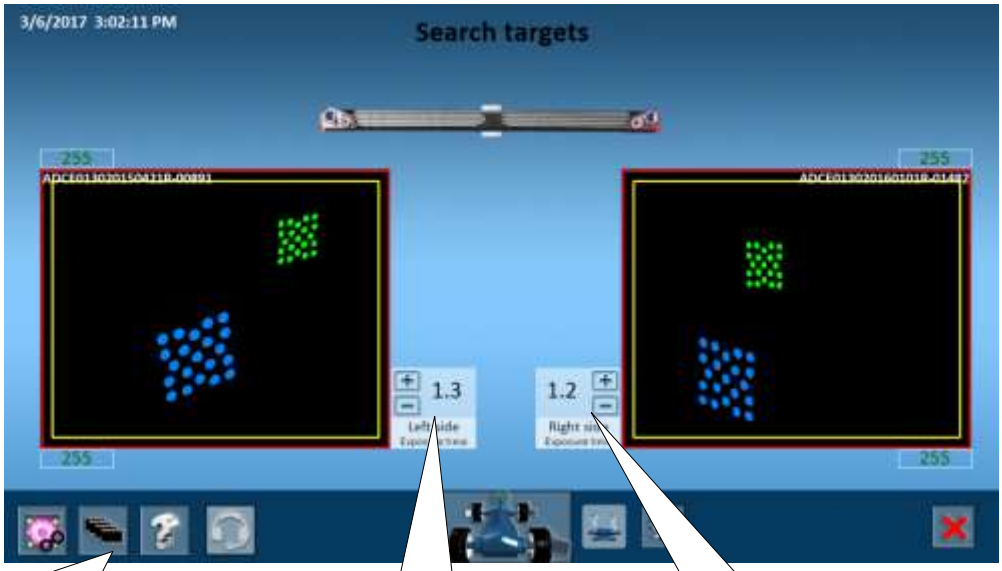
Control camera beam moving manually

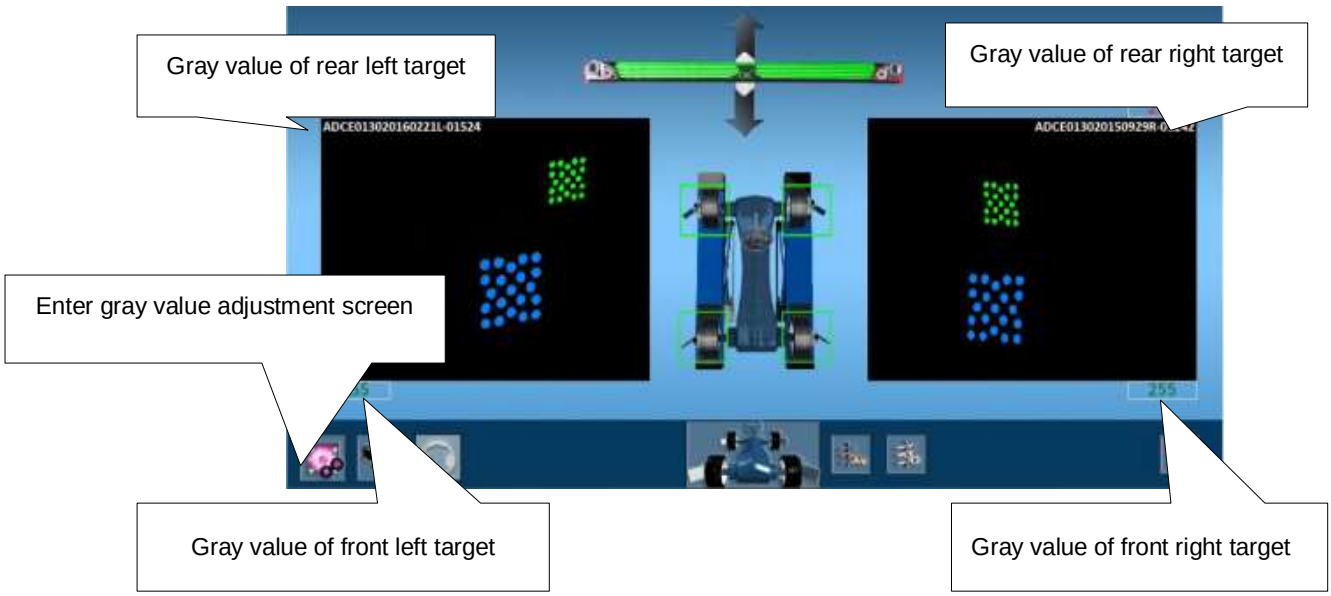
Control camera beam automatically

Search targets screen of automatic type 3D alignment

4.6.1 Target gray values adjustment

Target gray values means the dots brightness of targets that shot by the camera. Gray values depend on LED light board exposure time and camera gain.





4.6.2 Gray values range of front and rear targets

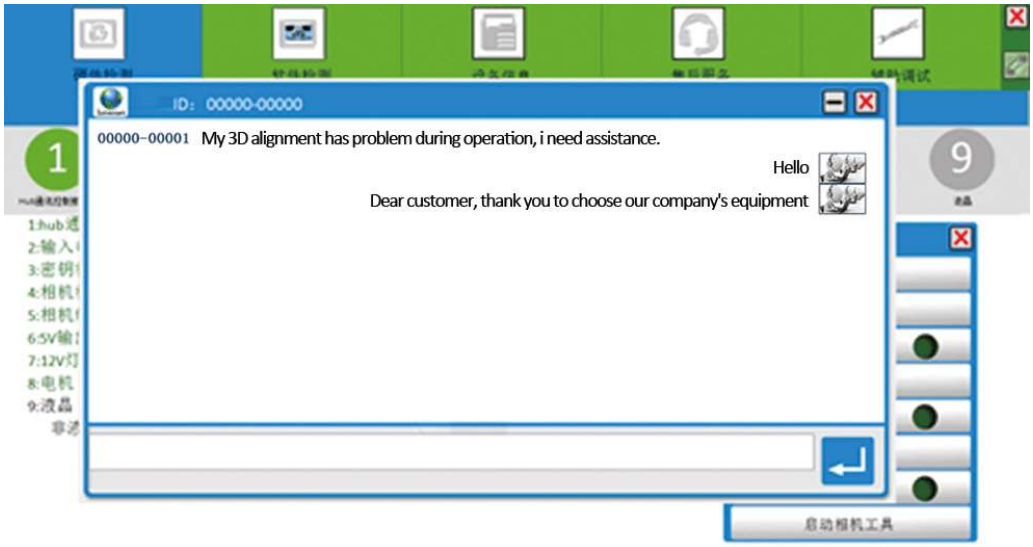
The gray values range of front and rear targets is 235-255. If the target gray value is less than 235 when the operator run the cameras on "preparation before measurement" screen, system will calculate exposure

time automatically, also the system will indicate to enter “gray value adjustment” screen to adjust values to the correct range if calculation is failure. Measurement precision will be affected if the gray value less then 235.

The values on the screen is green when the rear targets gray value within the correct range, or it is red if the gray values out of correct range. The values on the screen is blue when the front targets gray value within the correct range, or it is red if the gray values out of correct range.

4.7 Cloud service-“You need”

Our 3D alignment software program has network chat tool –“You Need”. Operator can use it to ask after-sale service questions, can ask assistance.


ID: 00000-00000
00000-00001 My 3D alignment has problem during operation, i need assistance.
Hello
Dear customer, thank you to choose our company's equipment
启动相机工具

Chapter 5 Measurement Procedures

5.1 Homepage

5.1.1 Buttons explanation

	Exit software program system
	Operation manual

	System setting (set camera parameter, choose language, calibration, set company LOGO and information on the homepage and set header/footer page information …)
	Parking camera (help driver to drive the car on the lift)
	Search targets (check if the targets position is correct before measurement)
	Enter into measurement step through customer information screen
	Enter into measurement step through vehicle specification selection screen

5.2 Select vehicle specification

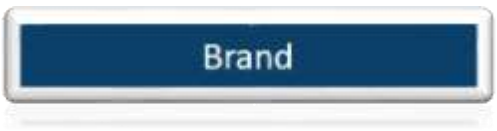
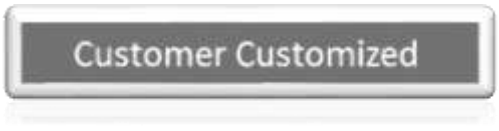
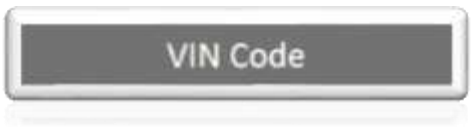
5.2.1 Enter vehicle specification selection

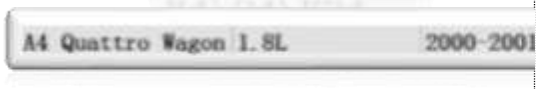
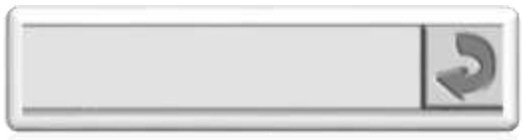
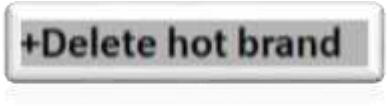
1.Operator can click vehicle specification button to enter vehicle specification selection screen to begin measurement.

2. If operator enter vehicle specification selection screen, wheel alignment measurement must after selecting vehicle specification.

5. 2. 2 Buttons explanation

	Back to homepage
	Operation manual
	Check detailed vehicle specification

	Search targets
	Can’t do next step. Must choose vehicle specification first
	Next step
	Can’t do fast forward. Must choose vehicle specification first.
	Fast forward. Skip customer information adding, go to preparation for measurement directly.
	Pervious step
	When choose vehicle specification, choose vehicle model first.
	Choose vehicle specification from hot brand list
	Choose vehicle specification from saved vehicle specification by operator
	Choose vehicle specification from vehicle’s VIN number

	Search by vehicle model's first letter
	Choose the specific vehicle name
	Choose the specific vehicle model
	Search
	Search button
	Delete searched information
	Back
	Specific model selection
	Add hot brand
	Delete hot brand

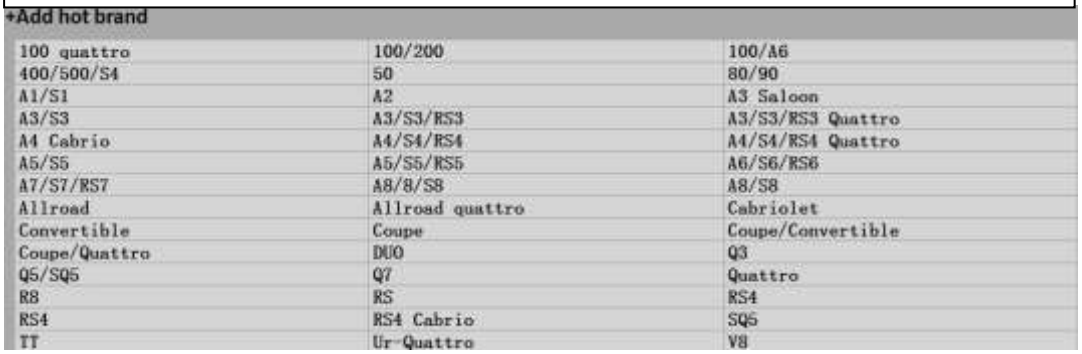
	Add customized vehicle specification Delete customized vehicle specification

5.2.3 Operation explanation:

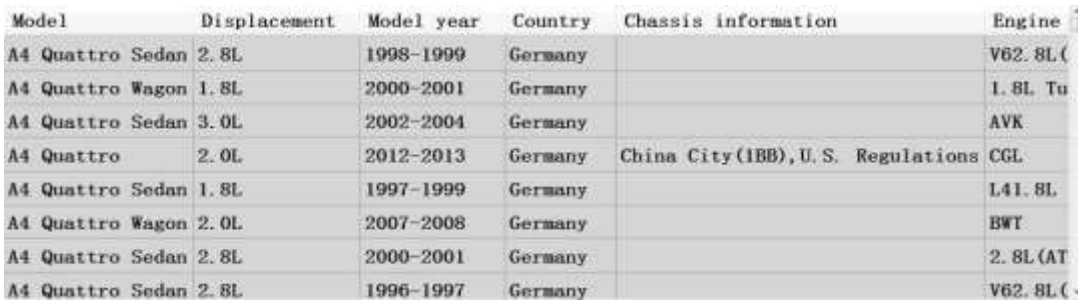
1) Vehicle database structure:

First class: vehicle model. Such as AUDI, each model has its own LOGO. So all the AUDI car use a same LOGO.

Second class: car series. Such as AUDI A4 series. There are many different models under this series.



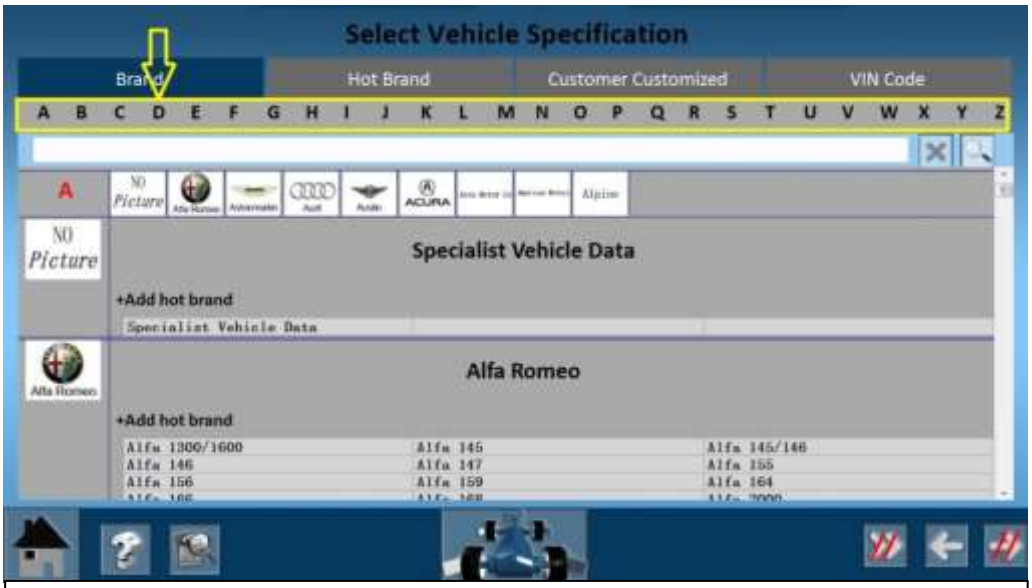
Third class: specific model. Such as AUDI A4, 1.8L.



2) Search vehicle specification by vehicle brand

1. Enter vehicle specification selection from homepage

2. System default to choose vehicle specification from brand first.



3.Operator use the first letter to choose the brand, such as BMW, we can click B to search.

4. Select vehicle brand LOGO, such as BMW brand.

5. After brand selection, choose the series under this brand, then choose the vehicle under this series. Such as BMW, X3.

6. At last, select the specific vehicle according to different configuration.

3) Check the detailed information of specific vehicle:

After vehicle specification selection, click detailed information button on the menu to check.

Vehicle detailed information

4) Search vehicle specification:

1. Input brand, model and relevant information in search box, and the vehicle's relevant information will display on the below list. See above photo for reference.

2. If input wrong vehicle information, can click "X" to delete and input again, see above photo for reference.

3. When all the relevant vehicle's information displayed on the list, operator can select the needed vehicle model to next specific searching screen.

4. On specific searching screen, operator can choose the vehicle according to the year, displacement, chassis information to find the final correct vehicle.

5. Operator also can searched by vehicle's LOGO if doesn't know the specific model. See above photo for reference.

6. After click LOGO's icon, all the relevant vehicle information will display on the list. See above photo for reference.

7. If it is not easy to find the vehicle due to too many list, operator can search again. First, click "X" button to delete the previous searched information, and then input the new key word (such as year) to search again. If there isn't the vehicle that operator wants to find, please click the back button.

8. Besides input brand and series of vehicle to search, also can input the key words to search. Such as search 2007 under Audi A4 item.

9. Then all the relevant vehicle will display on the list.

5) Add and delete hot brand:

1. Operator can add the popular brand to the hot brand list, which is convenient for the search and operation. Select brand and click “add hot brand” icon.

2. The selected brand has been add to the hot brand list.

3. Operator can click “delete hot brand” icon to delete the brand from hot brand list.

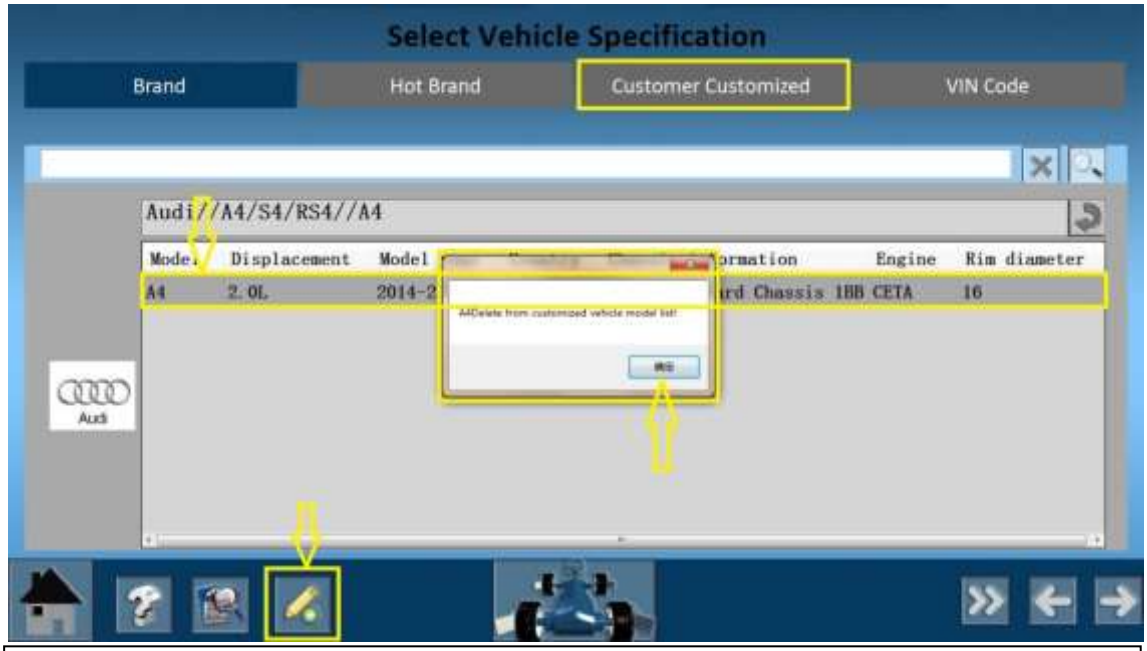
6) Add and delete customized vehicle specification

1. Operator can select popular vehicle model to add to the customized vehicle database, which is convenient for search. Check the above photo for operation reference.

2. After adding customized vehicle specification, screen will pop-up box to show adding is successful, then please click confirm button.

3. Choose the vehicle model from customized vehicle database. Select the vehicle model. See above photo for operation reference.

4. The customized vehicle specification list displayed on the screen.



5. Delete the customized vehicle specification. Select the vehicle specification that wants to delete, then click “adding” button, screen will pop-up box to show delete is successful, click confirm button to delete. See above photos for operation reference.

5.3 Customer Information

5.3.1 Input customer information

1. Operator can enter measurement system after inputting customer information, also can skip input customer information step to measure directly.
2. Vehicle license plate # must be input when input customer information.
3. Click next step after inputting customer information, system can save the customer information automatically and display on the customer information saved area.
4. Operator also can click history customer information to choose history information.

5.3.2 Buttons explanation:

	Back to homepage
	Operation manual
	Search target
	Next step

	Pervious step

5.3.3 Functions explanation

Operator can input customer's vehicle license plate #, name, address …here. Click next step after inputting, system can save the information automatically, which is convenient for searching in the future. License plate # must be input.

5.4 History customer information selection

1）Select history customer information

Operator can click "history customer information" to start the measurement.

2）Buttons explanation

	Back to homepage
	Operation manual
	Save
	Delete
	Add customer information
	Search target
	History detailed report
	Search customer information
	Previous step
	Next step

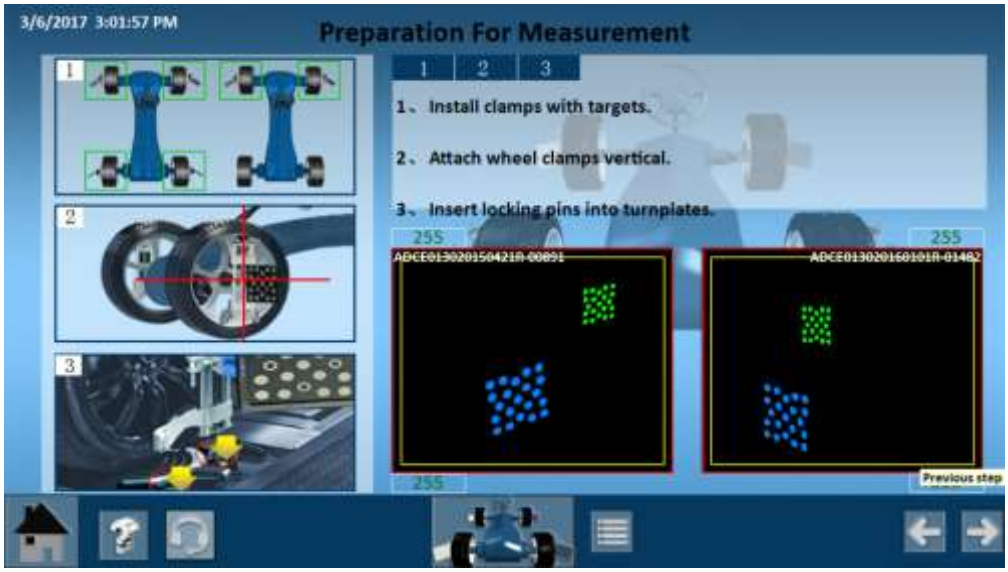
2）Customer information selection

Operator enter customer information selection screen to choose saved customer information, click next step to preparation before measurement.

3）Read history adjustment report

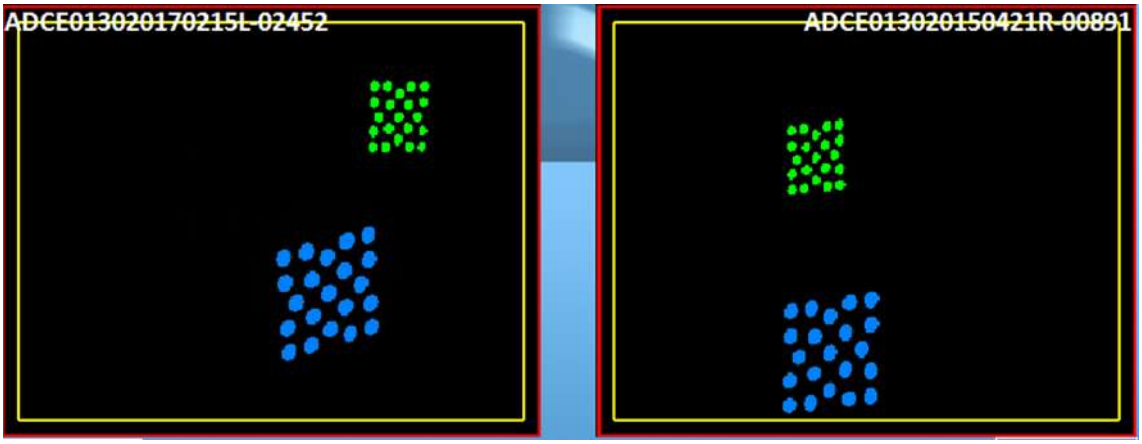
用户点击历史报告详细数据按键，进入历史调整报告。

5.5 Preparation before measurement

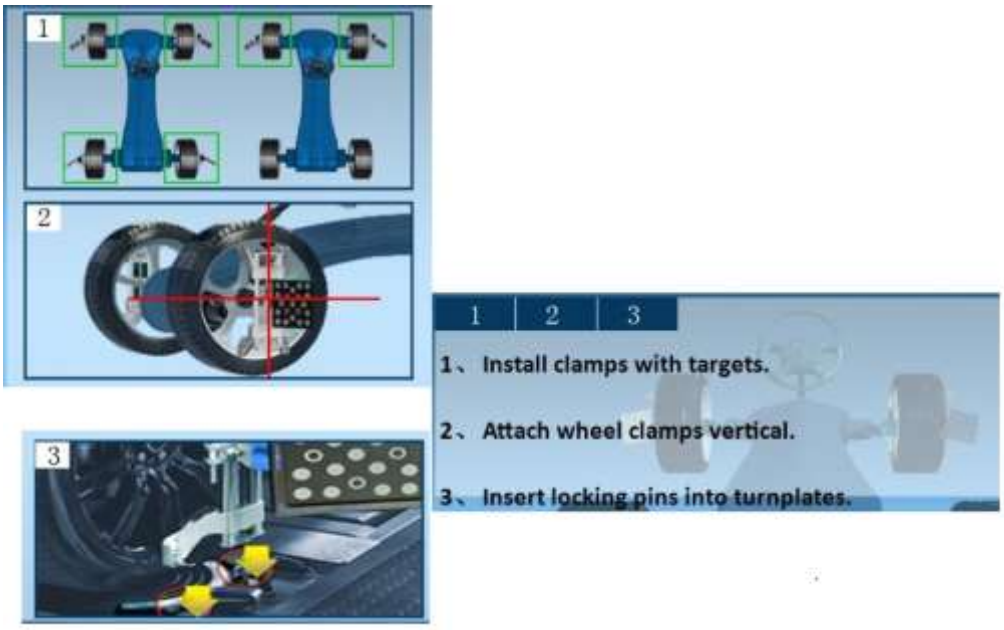


5.5.1 Attentions before measurement

1. First, operator need to observe if the targets position and status are correct. Front targets are blue, rear targets are green.

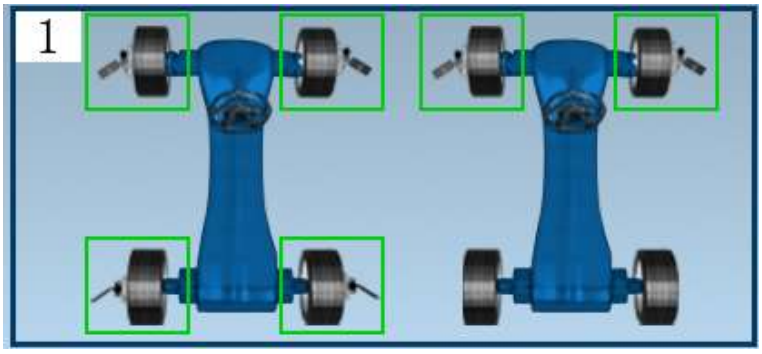


2. Prepare according to the three steps indication on the below screen.



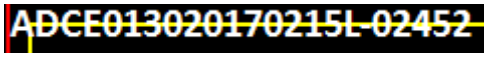
3. Install two targets on the front wheels if make two wheel alignment.

   Install four targets on the four wheels if make four wheel alignment.



4. At last, select the measurement way from the menu. The default measurement way is conventional push vehicle way.

5.5.2 Buttons explanation

	Back to homepage
	Operation manual
	You need
	Search target
	Select measurement ways
	Previous step
	Next step
	Display target’s gray value (not a button)
	Display camera’s serial# (not a button)

5.5.3 Preparation before four wheel alignment

1. Install four clamps with targets on the front and rear wheels.

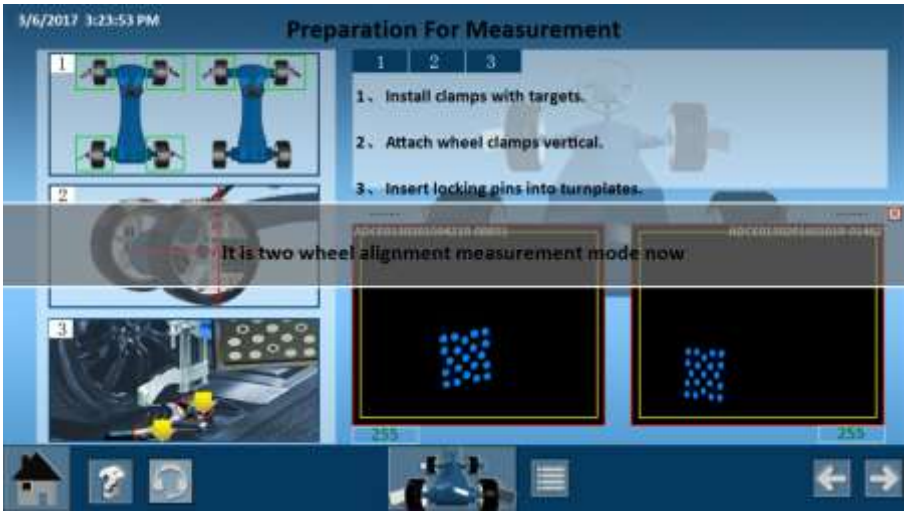
2. Check if the targets image color is correct on the screen, then click next step.

3. Enter “conventional push vehicle way” measurement after system calculate target’s gray value automatically.

5.5.4 Preparation before two wheel alignment

1. Install two clamps with front targets on the front wheels. Must install front small targets on the front wheels, cannot use rear big targets.

2. System indicate current situation is two wheel alignment mode



3. Check if the targets image color is correct on the screen, then click next step.

4. Enter “conventional push vehicle way” measurement after system calculate target’s gray value automatically.

5.6 Conventional measurement

5.6.1 Attentions before conventional measurement

1. Insert the fixed pins of turntable, insert the fixed pins of slide slip.

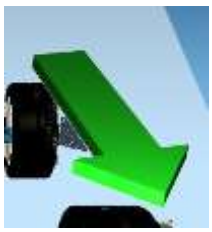
2. Operator must stand in the middle of vehicle head to push or in the middle of vehicle back to drag the car. If push the car by moving wheels by hands, it must use straight forward or backward direction strength, cannot use inclined direction strength. If not, will cause error measurement results.

3. Targets don't allow to be blocked during push vehicle procedure.

4. The vehicle must be back to the original position whatever choose which measurement way.

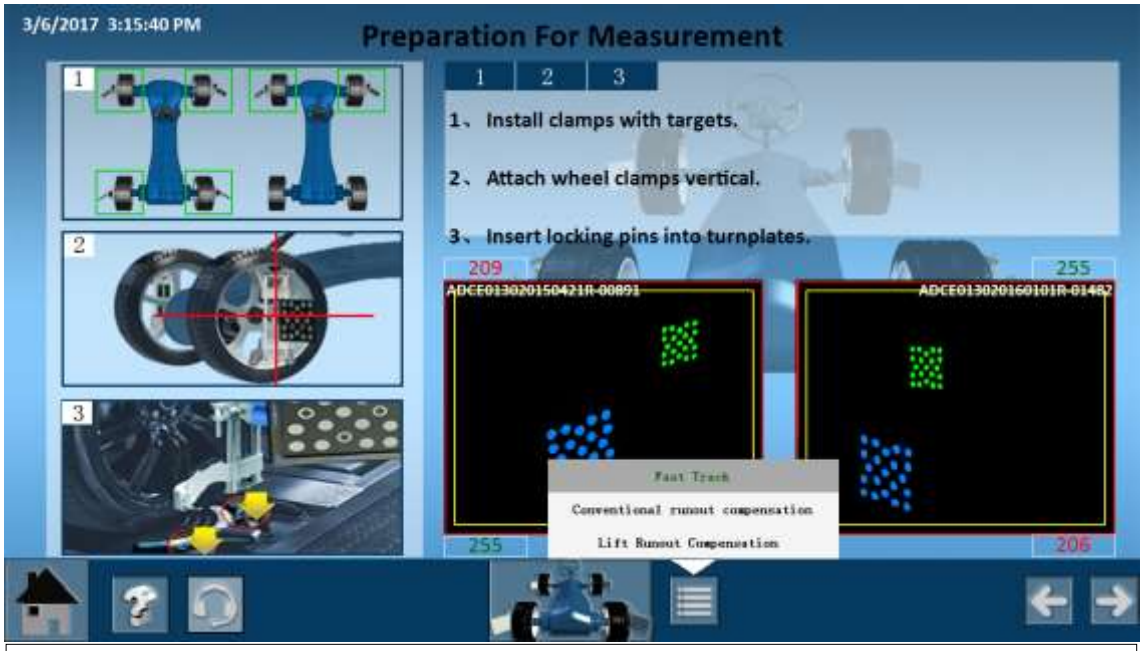
5.6.2 Buttons explanation

	Back to homepage
	Operation manual
	You need

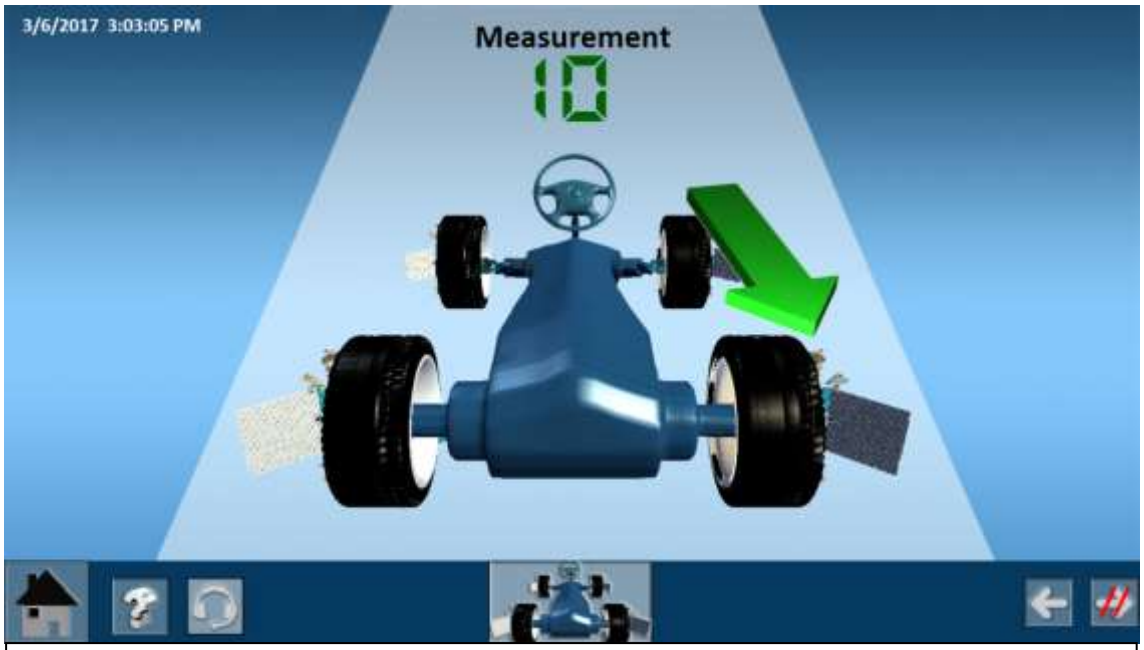
	Search target
	Read measurement report
	Pervious step
	Next step
	Fast forward, skip Caster measurement
	Push vehicle number (not a button)
	Push vehicle direction and distance arrow (not a button)

5.6.3 Conventional measurement under normal condition

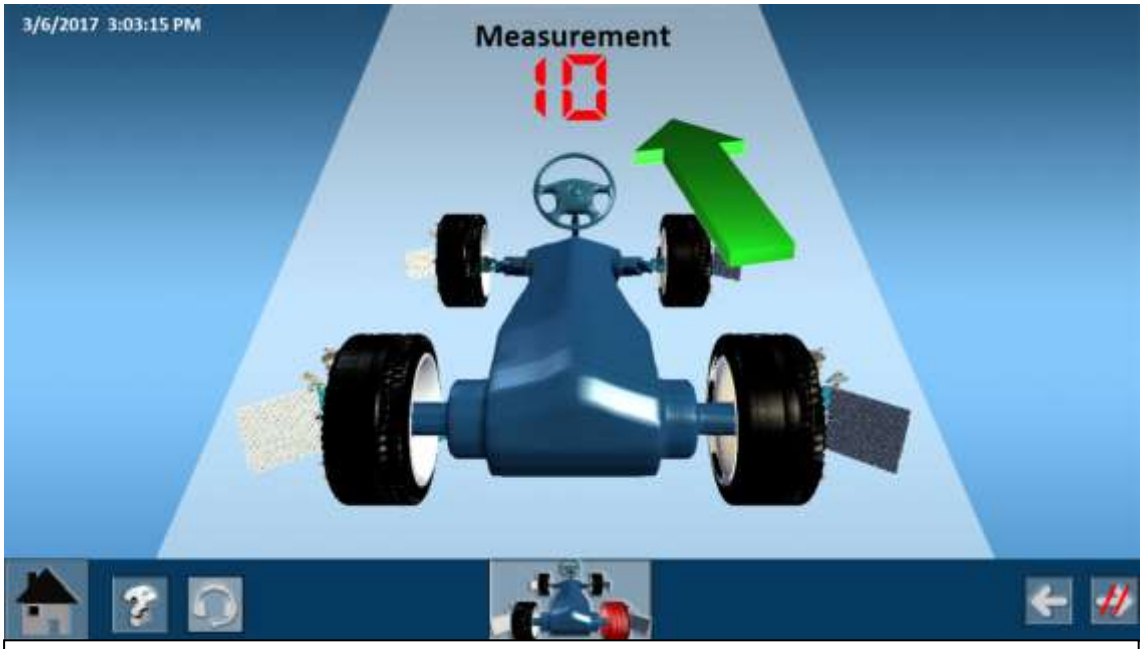
After preparation before measurement, click next step to conventional measurement screen. System default the next step is conventional measurement.



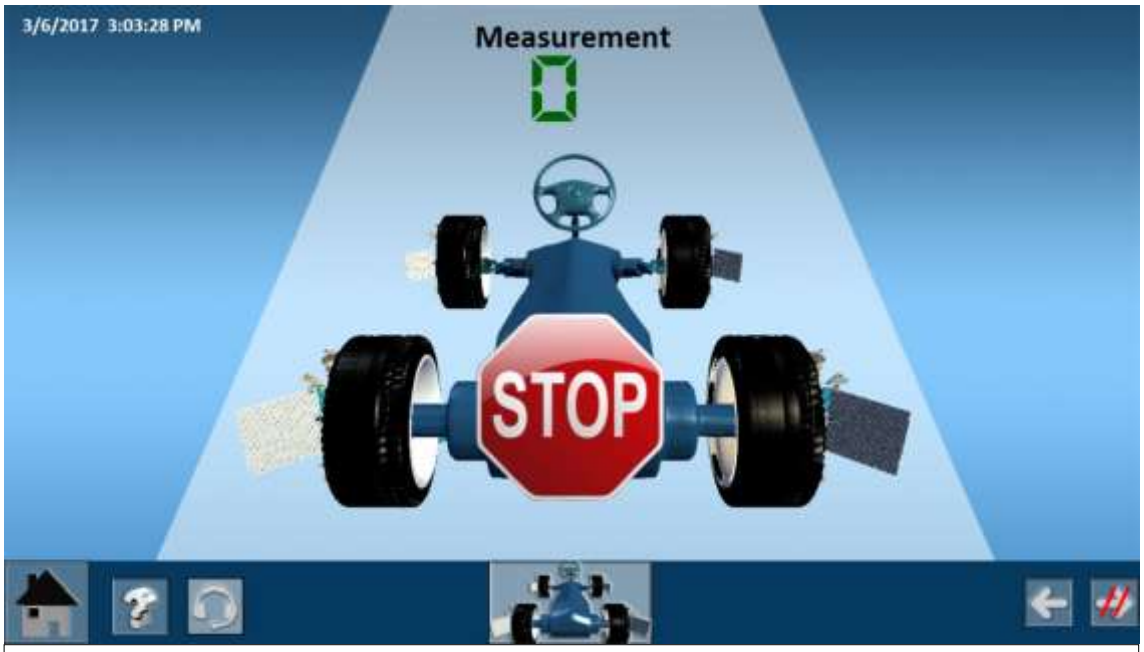
1. Enter conventional measurement by clicking next step on preparation before measurement screen, or choose this way from measurement way list.



2. Enter conventional measurement, push the vehicle slowly to the tail direction according to indication on the screen till the number from 10 to 0 and appear STOP.



3. When the screen appears opposite arrow indication, push the vehicle to head direction slowly till the number from 10 to 0 and appear STOP.



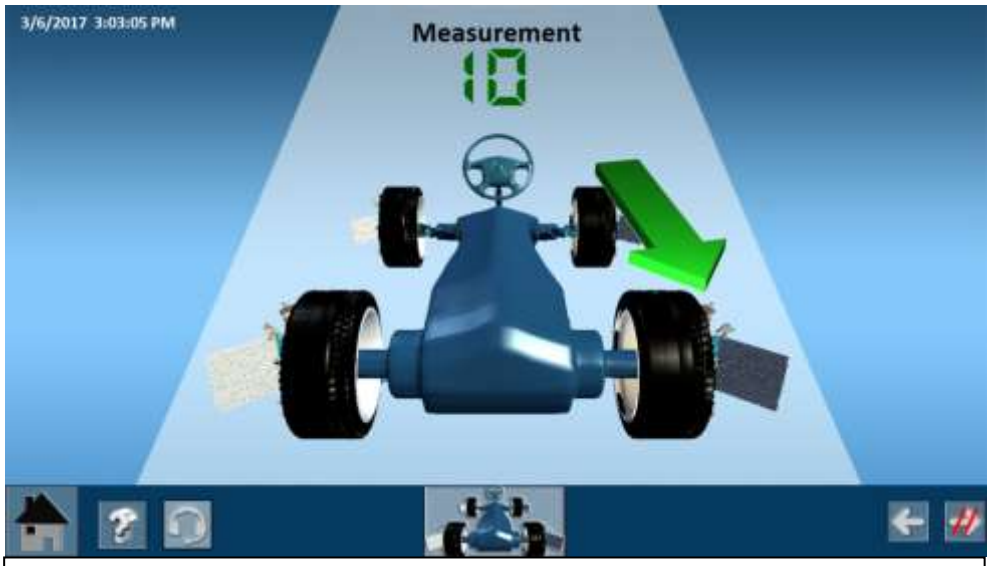
4. When “STOP” appears on the screen, must stop pushing immediately and will enter to preparation before measurement screen automatically.

5. After conventional measurement, enter preparation before Caster measurement.

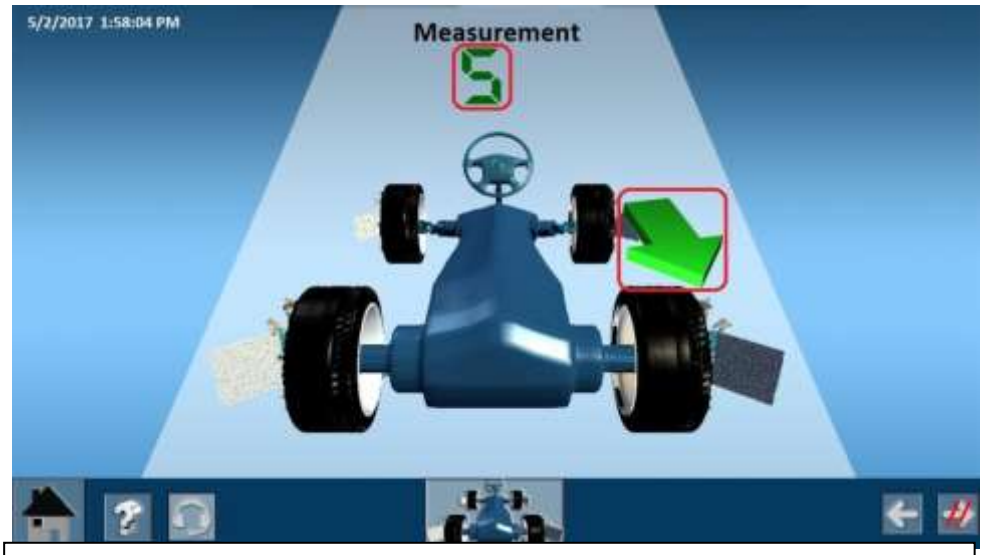
6. Check measurement results by clicking measurement report.

5.6.4 Conventional measurement under special condition

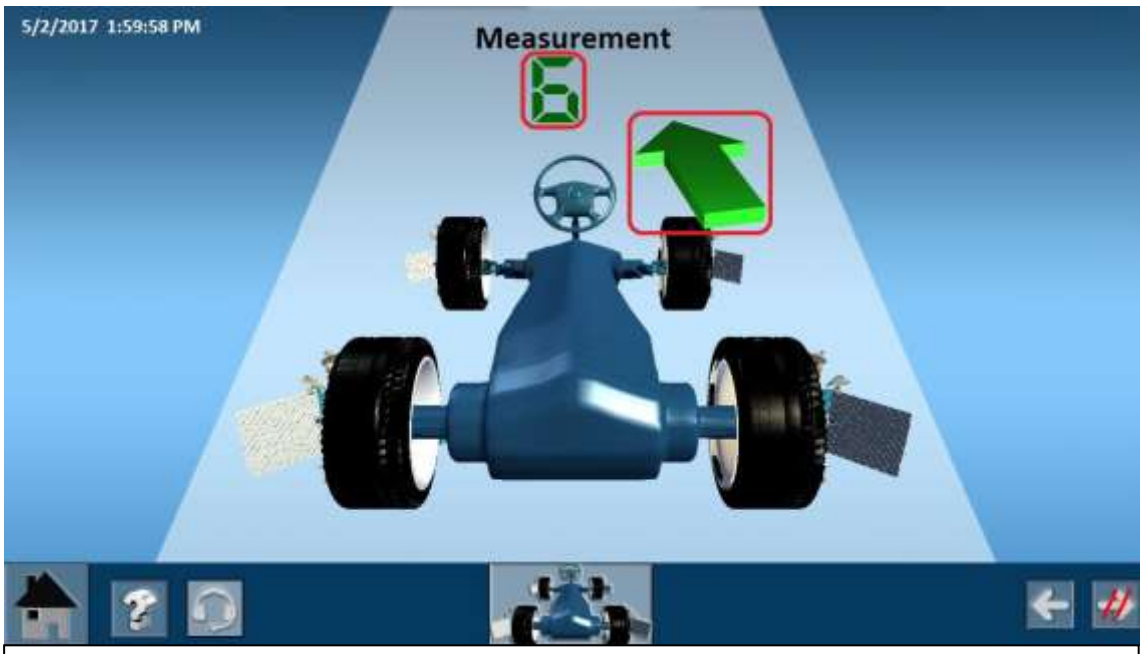
Some special vehicle that can't do normal distance pushing, or lift platform distance is not longer enough, we can choose short distance pushing way after selecting conventional measurement.



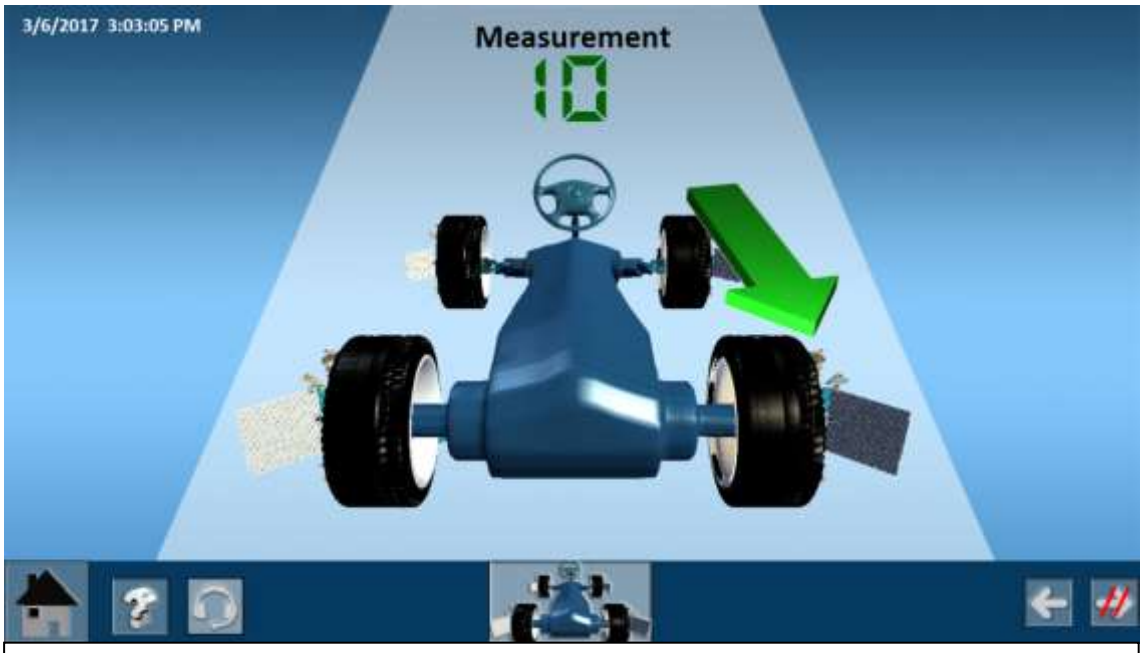
1. Enter conventional measurement, push the vehicle slowly to the tail direction according to the arrow indication on the screen.



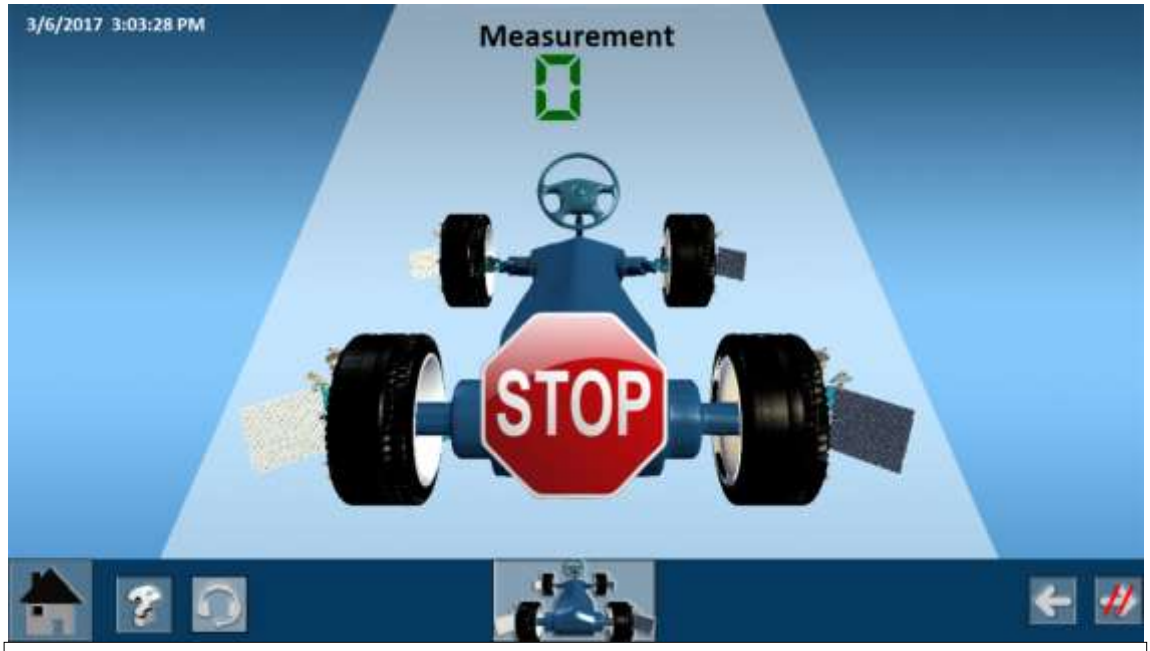
2. Push the vehicle till appear number 5, then stop pushing.



3. Then push the vehicle to the vehicle head direction.



4. When the number display 10, push the vehicle to the tail direction according to the arrow indication and back to the original positon.



5. Stop pushing immediately when STOP appears on the screen, and waiting the screen skip to preparation before Caster measurement.

5.7 Fast track

5.7.1 Preparation before fast track

1. Make sure the equipment make once TID after installation if choose fast track measurement, or choose conventional measurement way to do once alignment before using fast track.

2. Make sure the 4 claws of clamp stick to the wheel rim very closely, otherwise will affect measurement results.

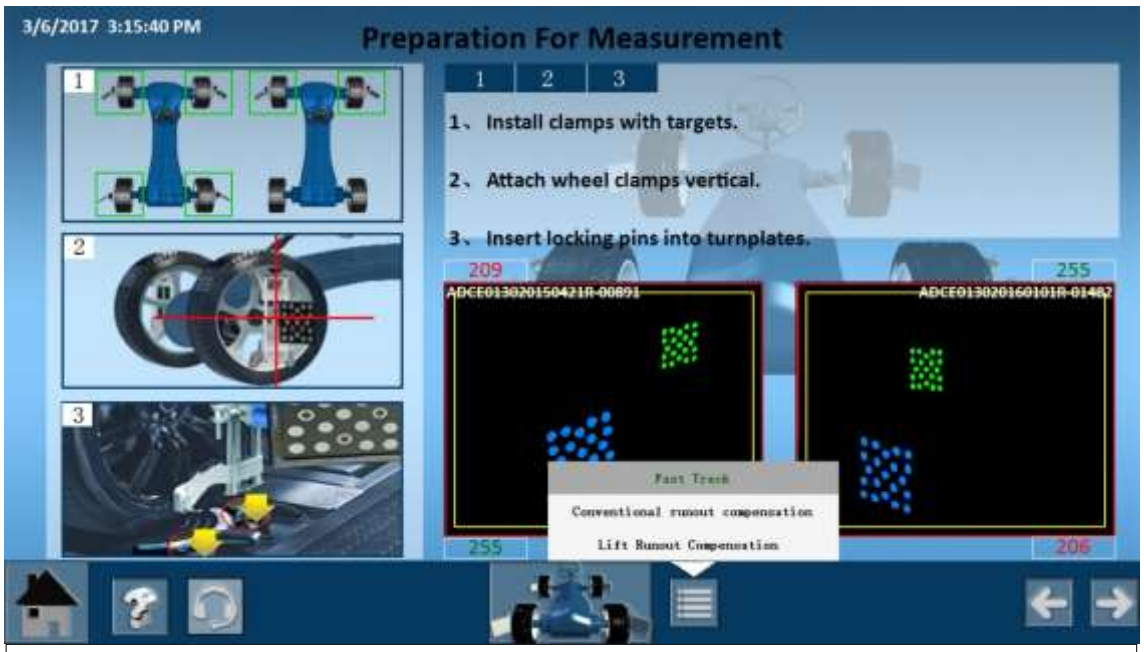
3. Clamps installation must be perpendicular to the lift platform.

Attention:

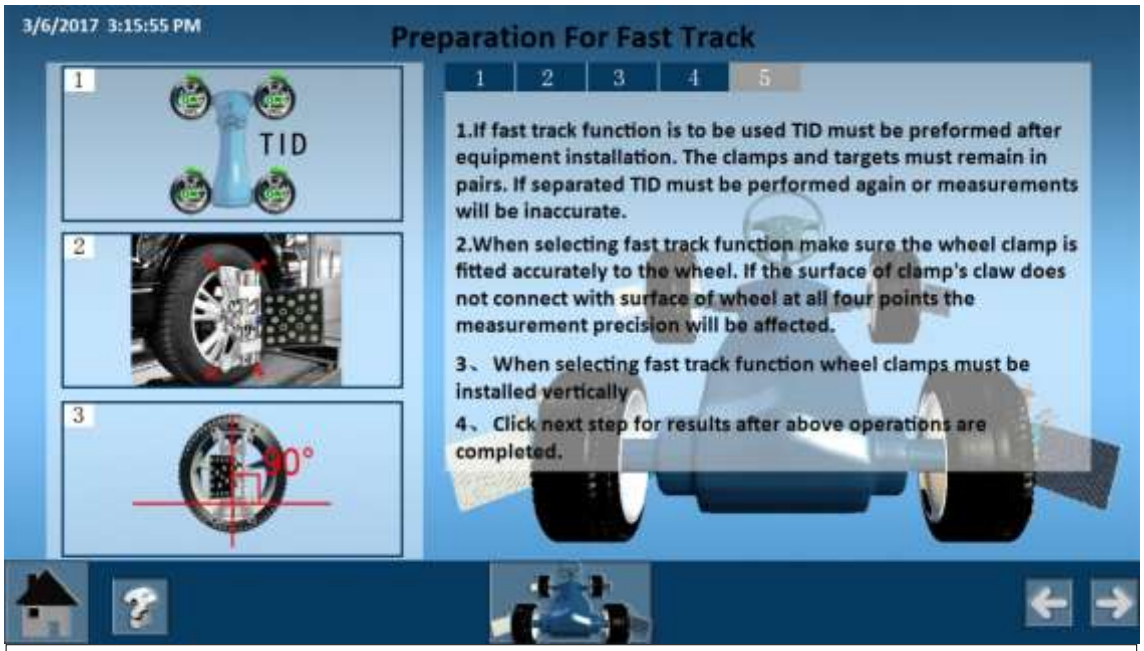
1. Fast track is used for the limited working area (working space is not enough to push vehicle). Do not suggest always to use, because the measurement precision maybe not as good as conventional measurement way.

2. Two wheel alignment cannot do fast track

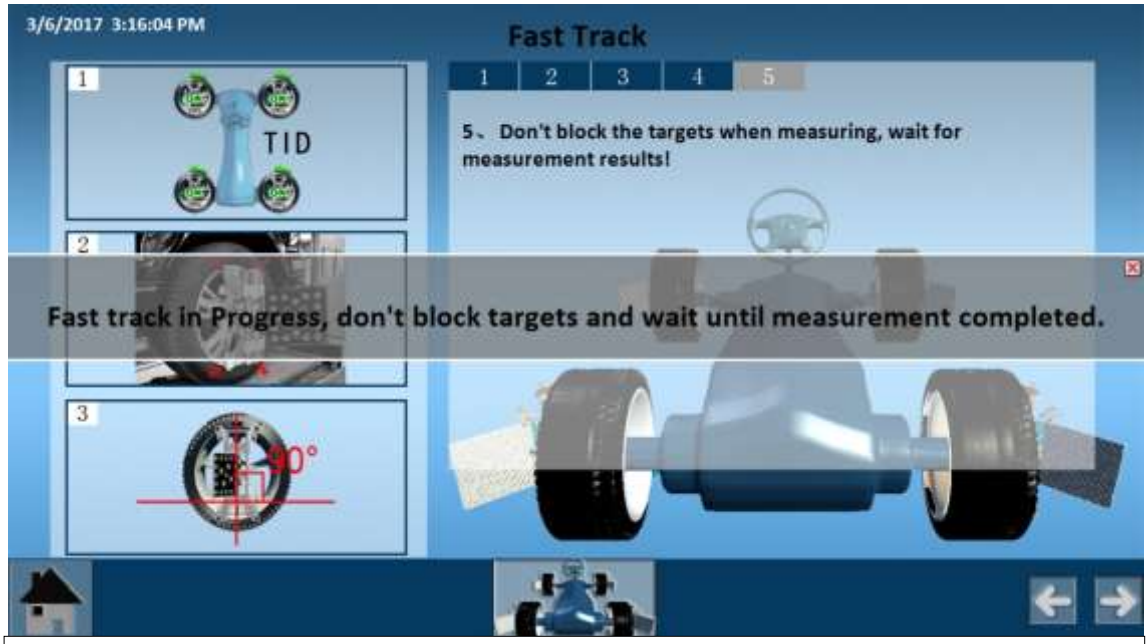
5.7.2 Fast track procedure



1. Select Fast track measurement on preparation before measurement screen



2. Enter preparation before fast track, requires: ①TID has been done ②4 claws of clamp stick to the wheel rim very closely ③clamps installation must be perpendicular to the ground. Then click next step.



3. Measuring

4. Fast track measurement finished, enter preparation before Caster measurement.

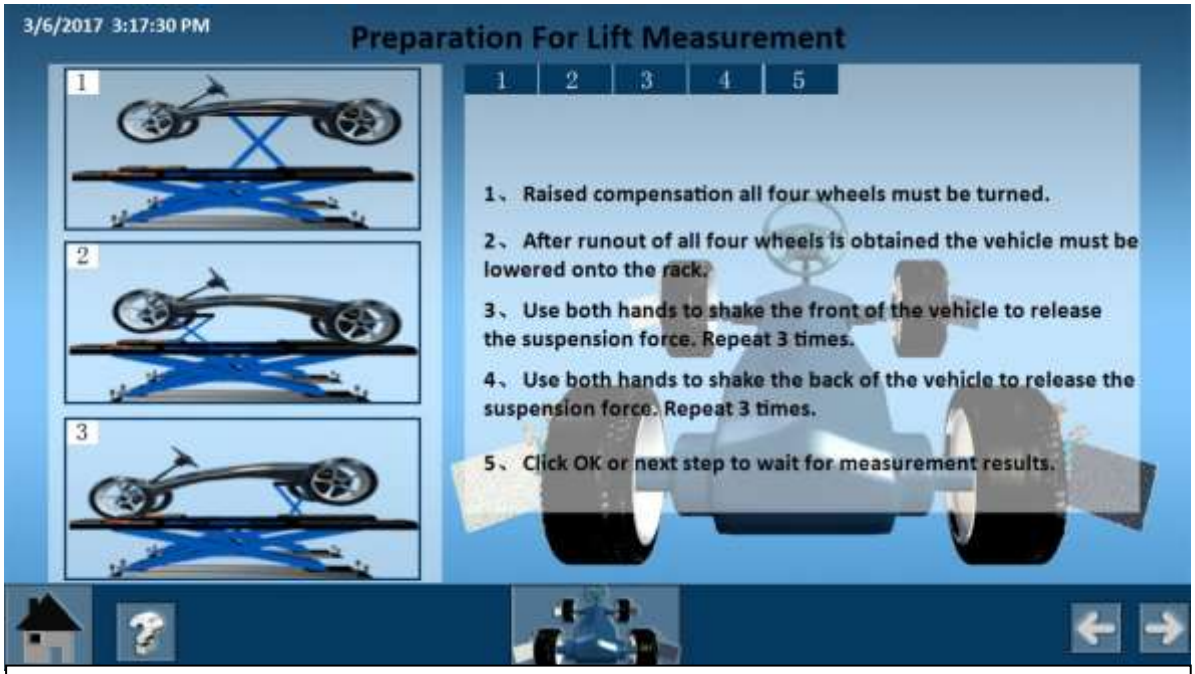
5.8 Lift measurement

5.8.1 Buttons explanation

	Back to homepage
	Operation manual
	Search target
	Read measurement report
	Pervious step
	Next step
	Fast forward, skip Caster measurement
	Start to turn the wheel
	Restart

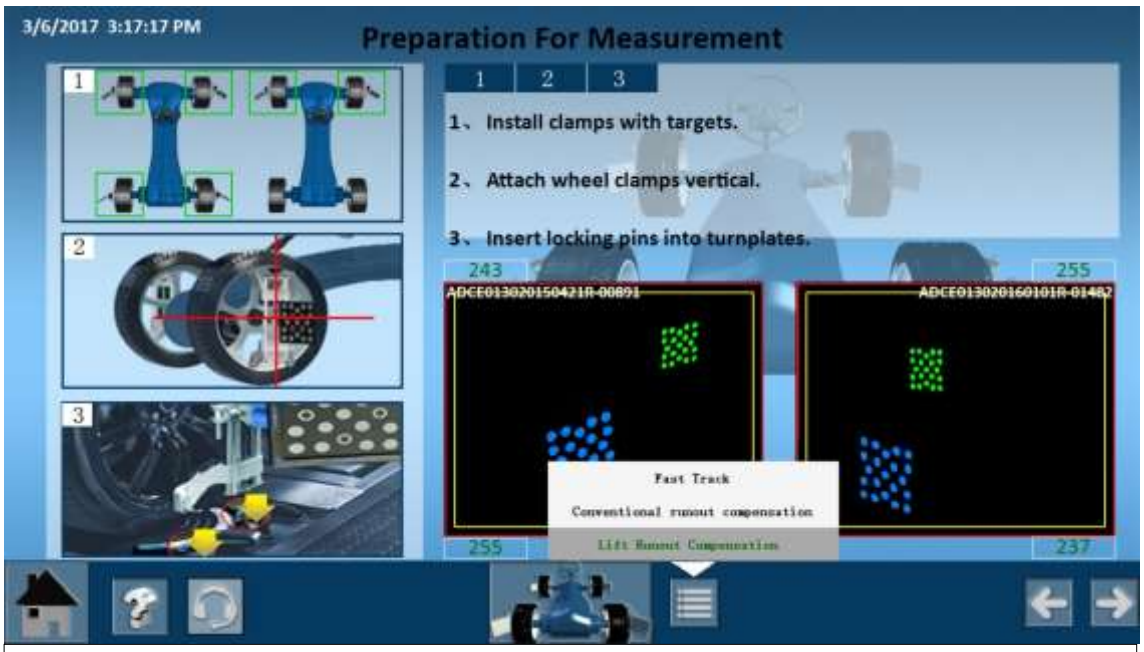
	Turning direction and distance display (not a button)
	Turning wheel finished (not a button)

5.8.2 Preparation before lift measurement

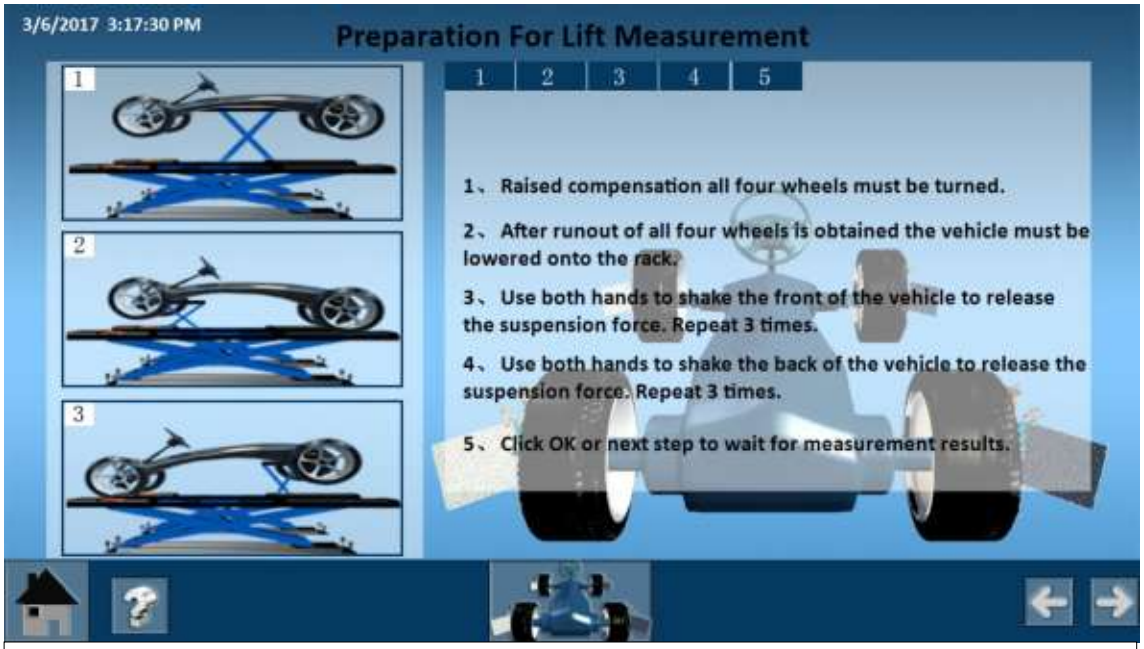


Raise up the vehicle before lift measurement, let the four tyres leave the lift platform,or the measured two tyres leave the platform.

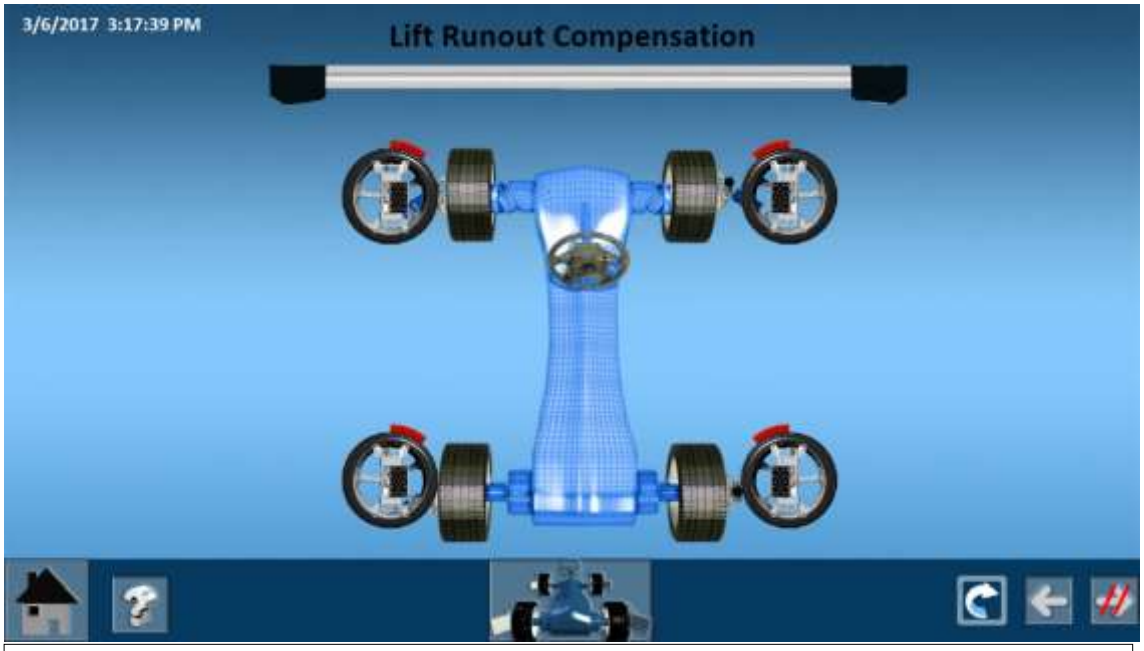
5.8.3 Lift measurement procedure



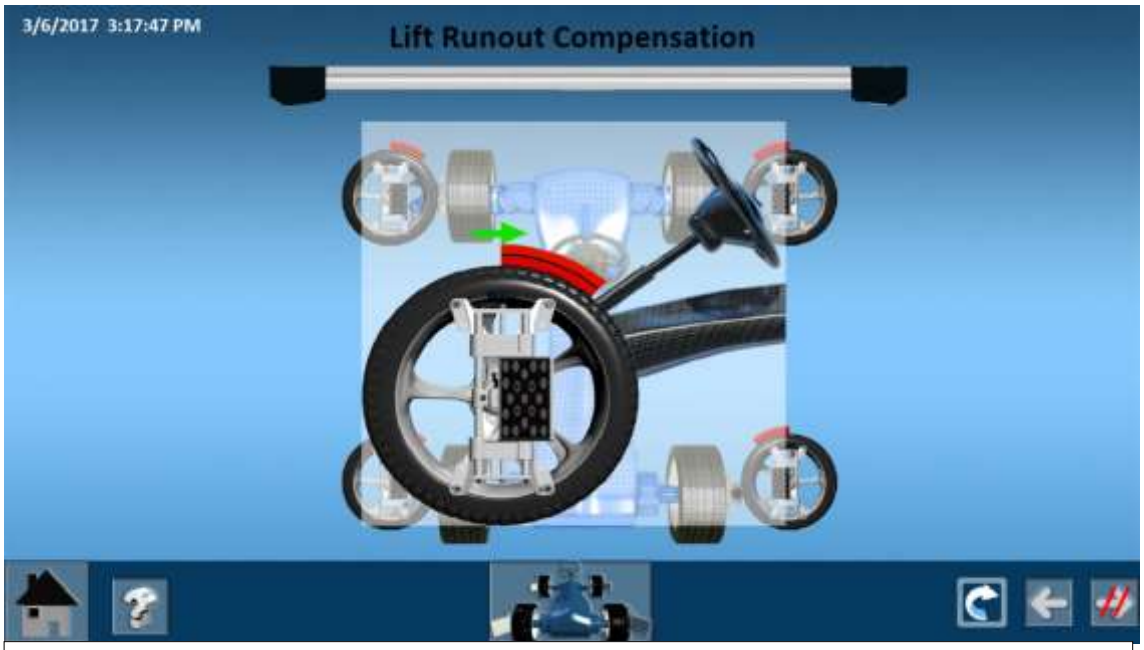
1. Select lift measurement on preparation before measurement, then click next step.



2. Enter preparation before lift measurement screen, operator need to prepare according to the indications on the screen, then click next step.



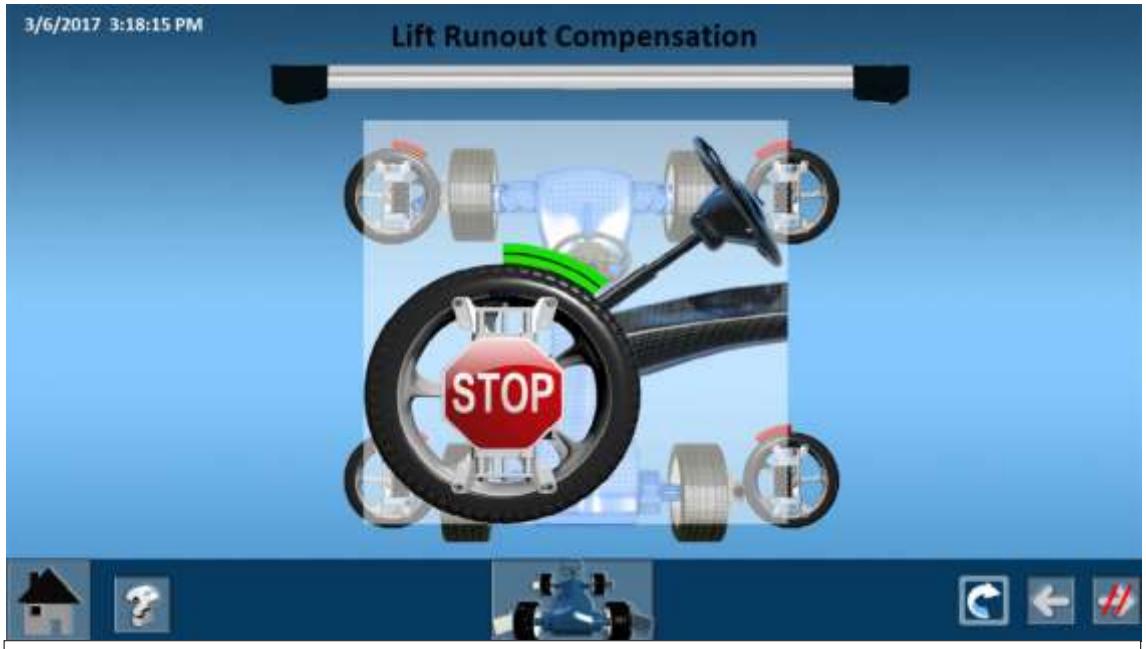
3. Enter lift measurement screen, click any tyre button to start the lift measurement. We click front left tyre first as example.



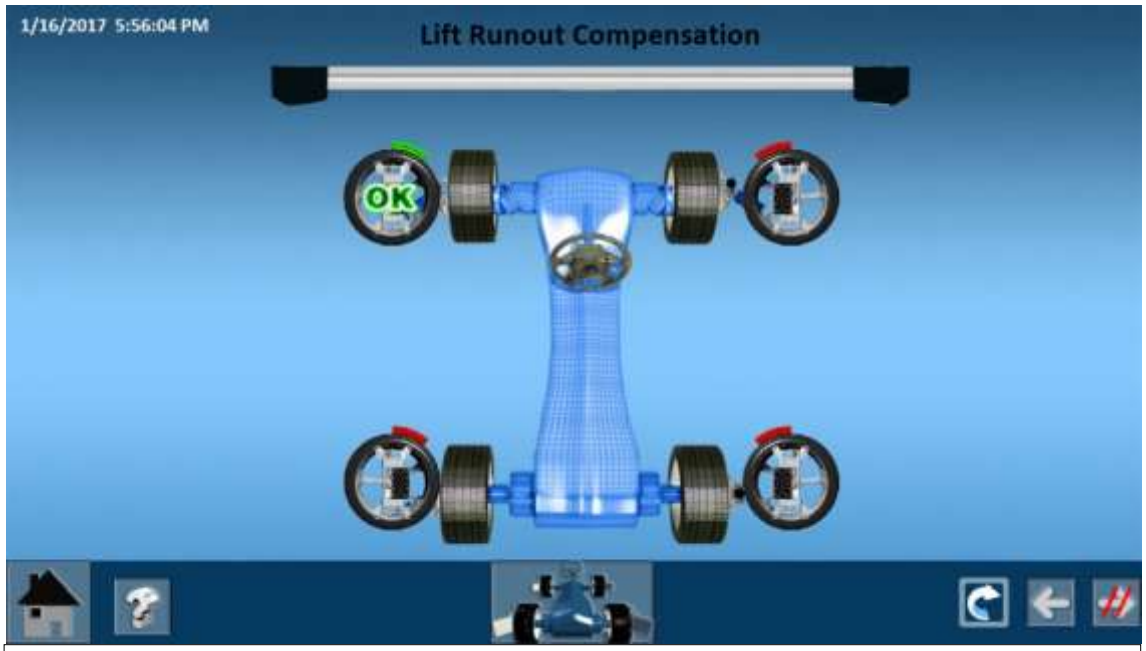
4. Click front left tyre, screen display zoom tyre and appears turning path in red color, also the turning direction in green color. Turn the tyre slowly to the tail direction according to the arrow indication.

5. Stop turning when STOP appears on the screen, waiting next turning back indication.

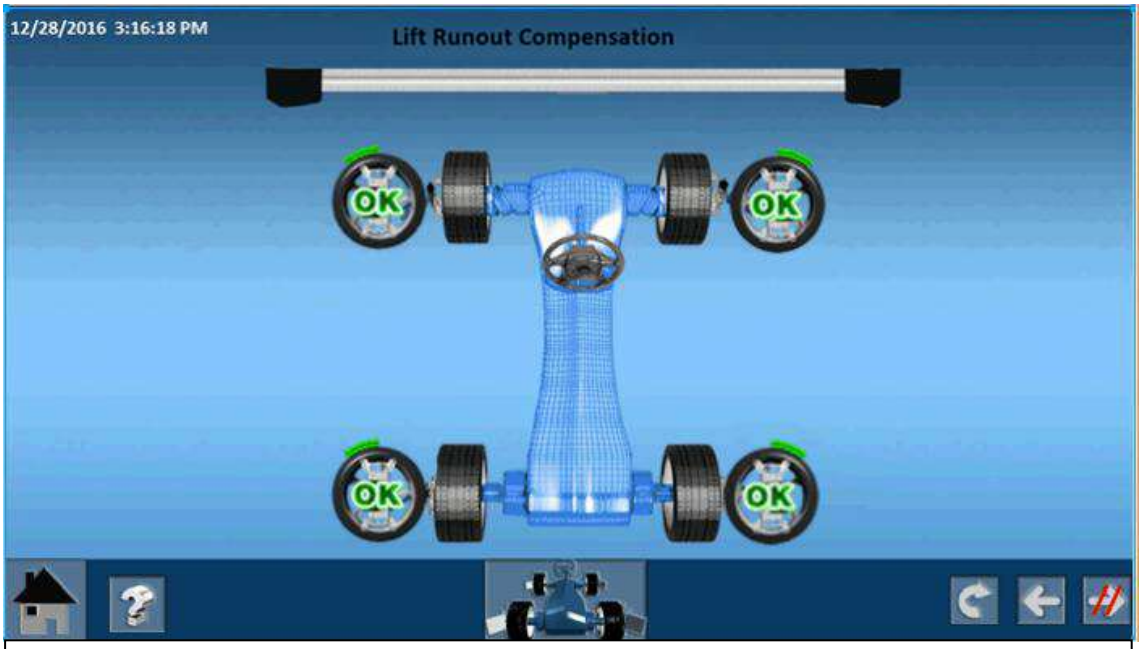
6. When appears turn back arrow, turn the tyre slowly according to the arrow indication.



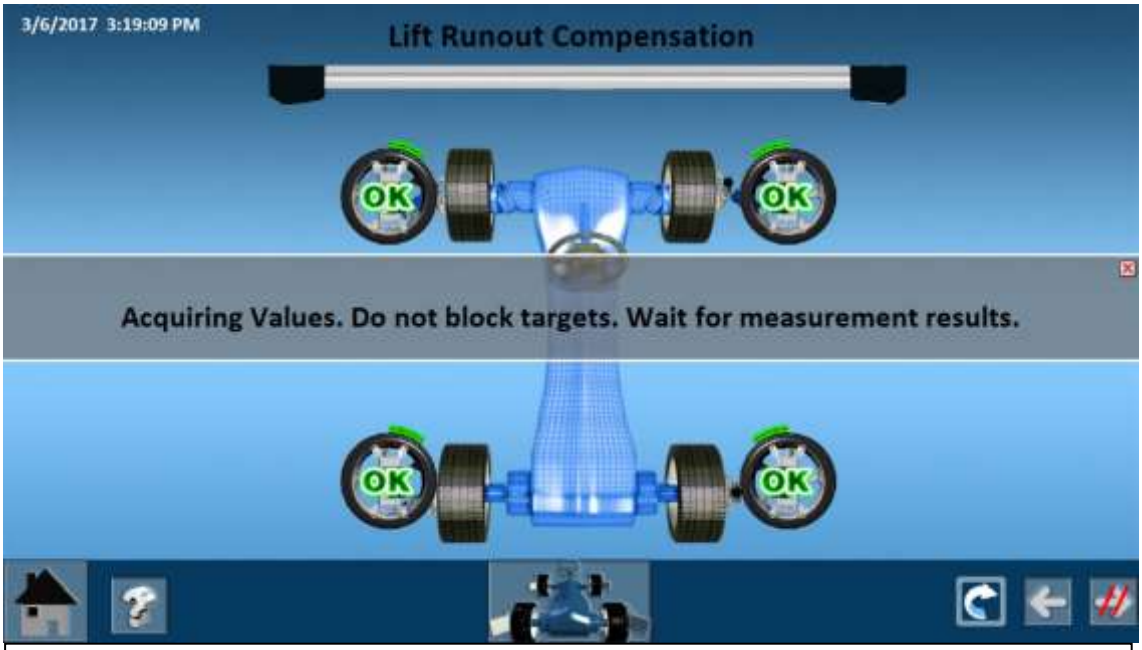
7. Stop turning when screen appears STOP, and waiting.



8. Measurement page closed, left front tyre’s measurement finished, repeat the same procedure for other three tyres.



9. All the tyres measurement finished screen.



10. System indicate “Acquiring values, please don’t block targets, waiting for the results” automatically on the screen.

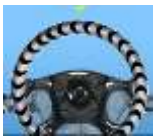
11. After 4 wheels measurement all finished, let the 4 wheels of the vehicle on the lift or on the ground totally. Then strongly press vehicle head 3-4 times, strongly press vehicle tail 3-4 times, release the tires and suspension tension caused by vehile elevated. Click next step to continue.

12. Lift measurement finished, enter preparation before Caster measurement.

5.9 Caster measurement

5.9.1 Buttons explanation

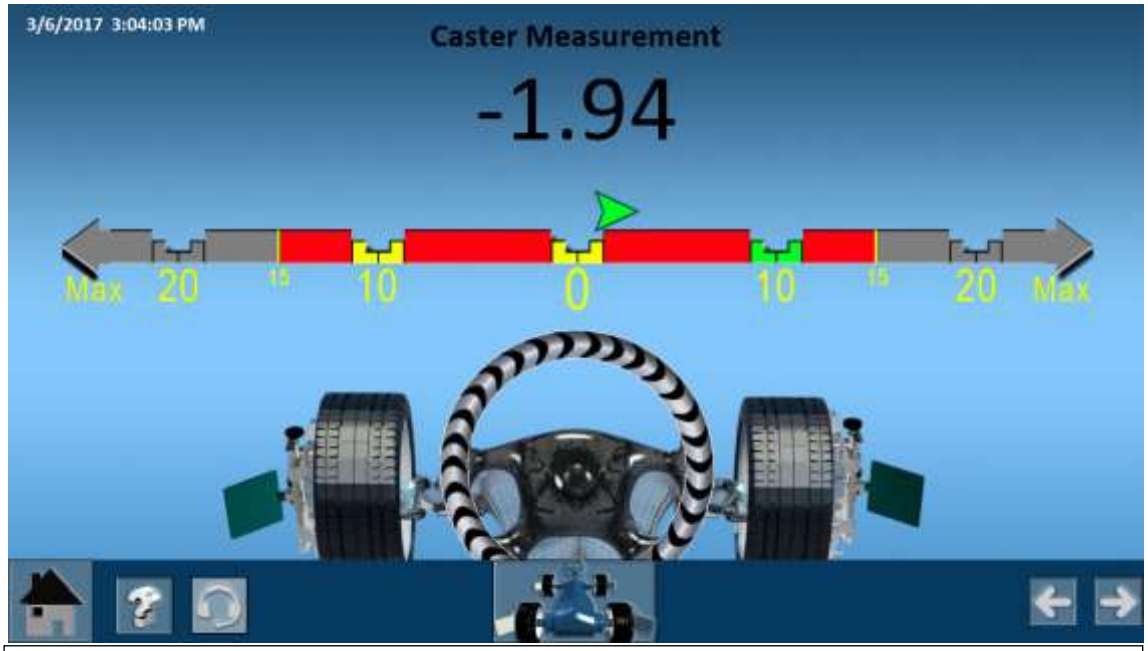
	Back to homepage
	Operation manual
	Search target
	Pervious step
	Next step
	Fast forward, skip Caster measurement
	Turning angle display (not a button)
	Steering wheel turning angle display (not a button)
	Steering wheel turning process display (not a button)

	Steering wheel turning display (not a button)

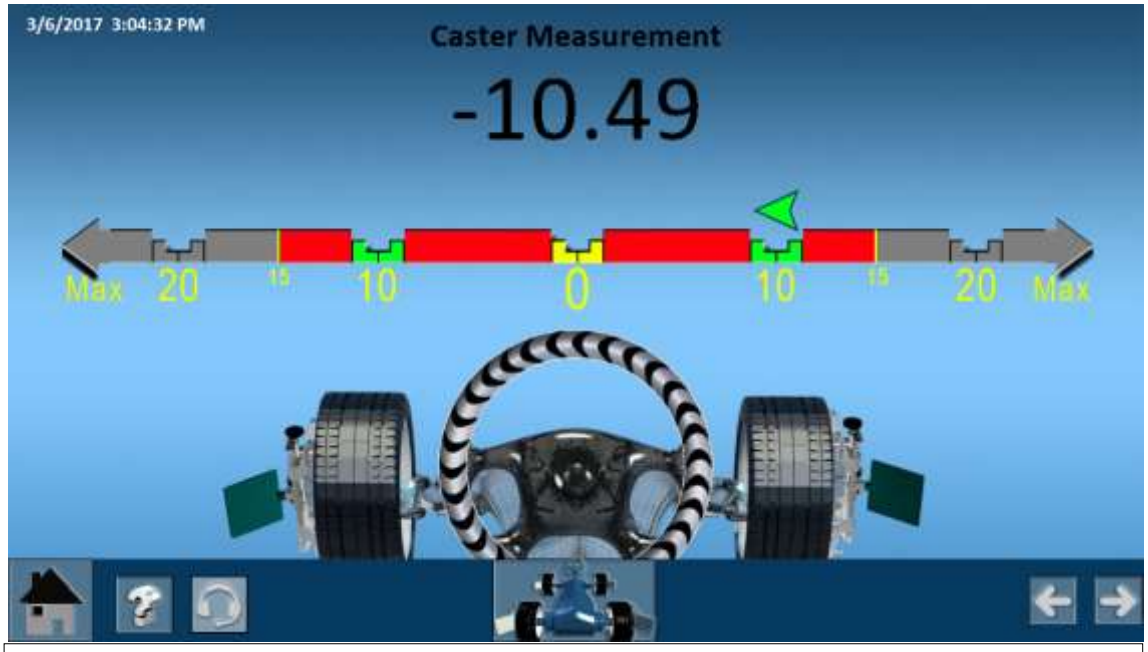
5.9.2 Preparation before Caster measurement

1. Pull up hand brake.
2. User pedal locker to lock foot brake.
3. Pull out fixed pin of turntable.
4. Shake vehicle head and tail 3 times to release the vehicle’s suspension.
5. Also can click fast forward button to straighten steering wheel screen, skip Caster measurement.

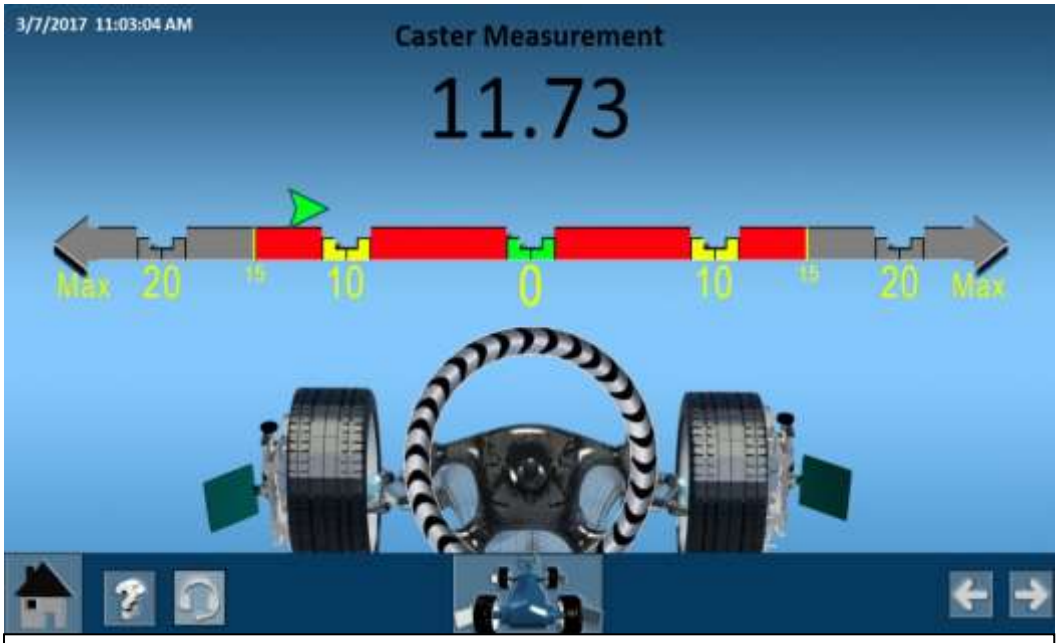
5.9.3 Caster measurement procedure



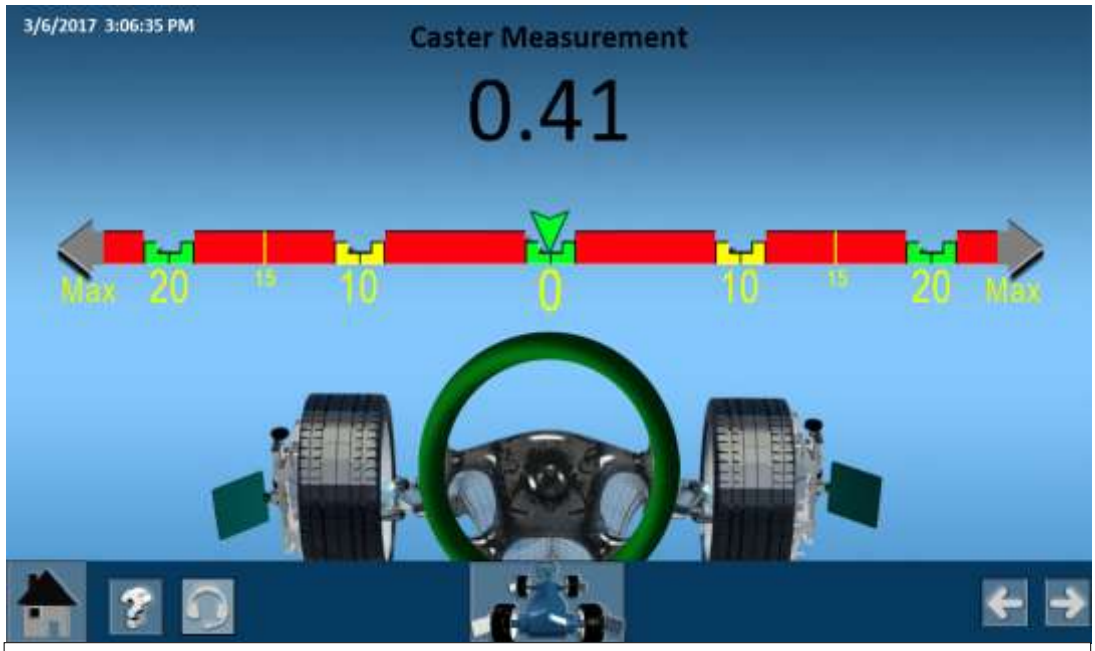
1. On Caster measurement screen, turn the steering wheel slowly with uniform motion to the right direction according to the arrow indication.



2 .When the steering wheel turn to right direction exceed -10 degree, the steering wheel on the screen will indicate to turn to left direction, also the green arrow turn to left, so the operator need to turn the steering wheel to the left direction.



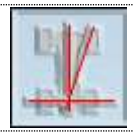
3. When the steering wheel turn to left direction exceed 10 degree, the steering wheel on the screen will indicate to turn to right direction to the center position, also the green arrow turn to right, so the operator need to turn the steering wheel to the right direction till the center position.



4. Turn the steering wheel to the right direction slowly till just over 0 degree can stopping turning, waiting calculation results.

5. 10 Straighten the steering wheel by eye

5.10.1 Buttons explanation

	Back to homepage
	Operation manual
	Search targets
	Pervious step
	Next step
	Two wheel alignment thrust line revised

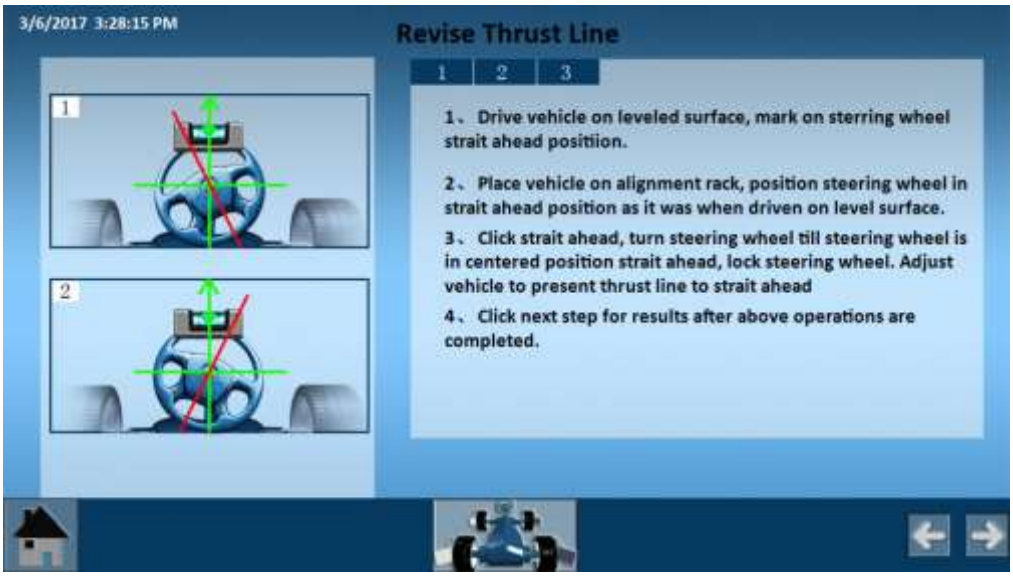
5.10.2 Four wheel alignment straighten the steering wheel by eye

1. Operator can enter straighten the steering wheel after conventional push vehicle measurement directly, or enter straighten the steering wheel after Caster measurement.
2. Turn the steering wheel to the left and right, then straighten the steering wheel.
3. Pull up hand brake.

4. Specific operation see the instructions on the screen for reference.

5. On straighten steering wheel screen, the targets can’t be blocked when click next step. Otherwise, the single toe measurement results will be affected.

5.10.3 Two wheel alignment straighten the steering wheel by eye



1. Operator can enter straighten the steering wheel after conventional push vehicle measurement directly, or enter straighten the steering wheel after Caster measurement.
2. First, it need to confirm if the steering wheel of the measured vehicle has offset during driving. It need to click “revise thrust line manually” button to revise the thrust line if has offset.
3. Pull up hand brake.
4. Specific operation see the instructions on the screen for reference.
5. On straighten steering wheel screen, the targets can’t be blocked when click next step. Otherwise, the single toe measurement results will be affected.

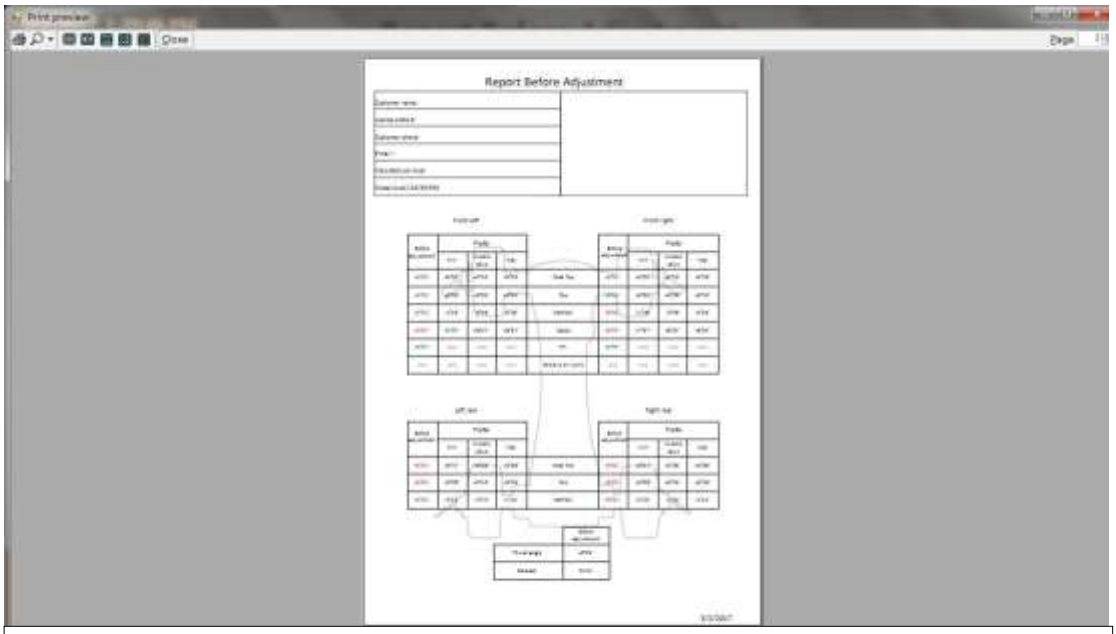
5.11 Report before adjustment

5.11.1 Buttons explanation

	Back to homepage
	Operation manual

	Print
	Add customer information
	Search target
	Read measurement report
	Previous step
	Next step

5.11.2 Report before adjustment explanation



Print report

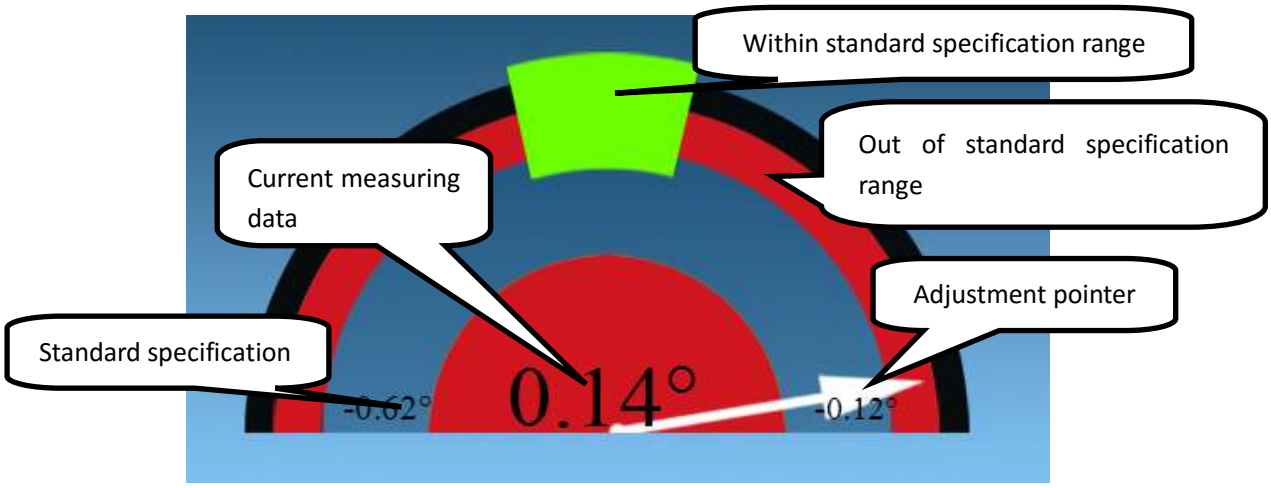
Chapter 6 Adjustment

Operator need to enter adjustment function after “report before adjustment”. The adjustment procedure should be: Caster adjustment (if operator made Caster measurement), rear wheels adjustment, front wheels adjustment. If the operator skip Caster measurement, the adjustment procedure should be: rear wheels adjustment, front wheels adjustment. And it needs to adjust Camber first, then adjust Toe.

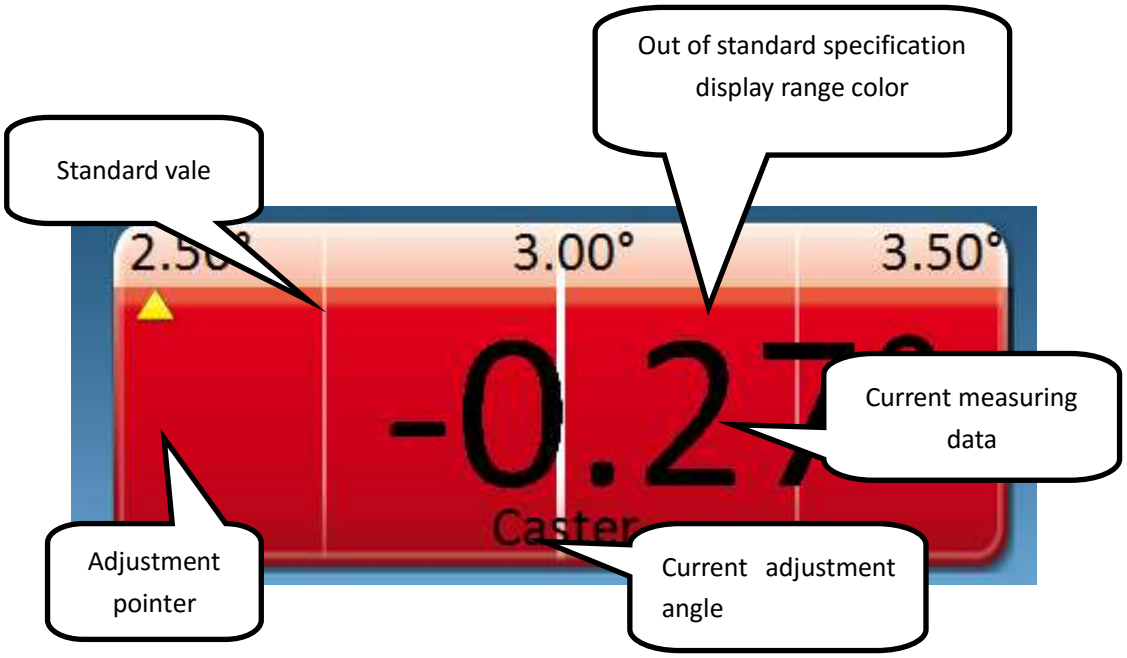
6.1 Adjustment widgets explanation

3D software adjustment widgets divided as “pointer type of oil gauge” and “digital type”. Adjustment screen will display the adjustable information by ruler, number, pointer and color.

It displays the minimum and maximum value of standard value under the ruler. The dynamic value above the ruler is the current measuring data. The display area color represents the relationship between the dynamic value and standard value. Red color means the measuring data is out of standard vehicle specification range, so need to adjust. Green color means the measuring data within the standard specification range.



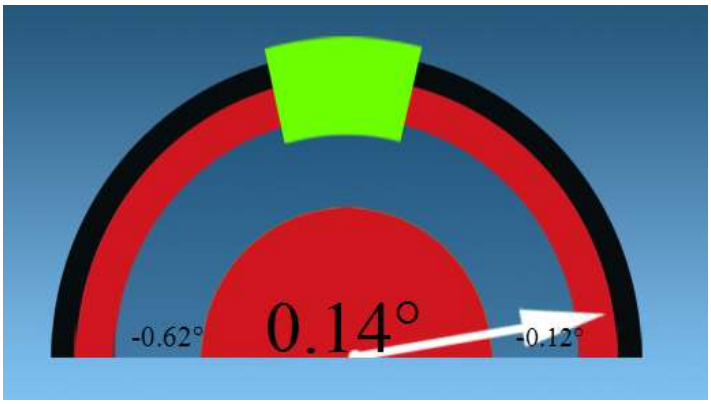
Pointer type of oil gauge



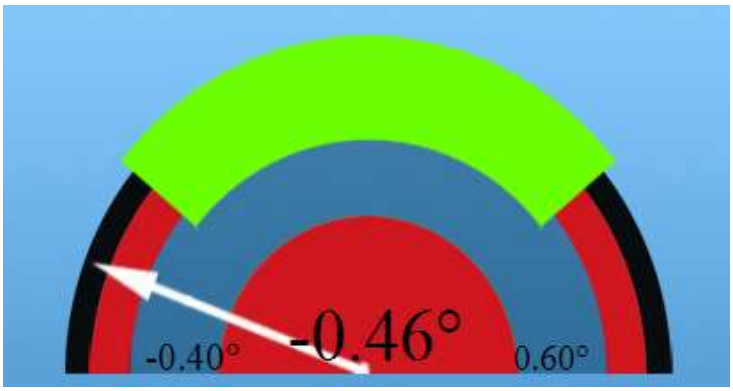
Digital type

6.1.1 Pointer type of oil gauge status explanation

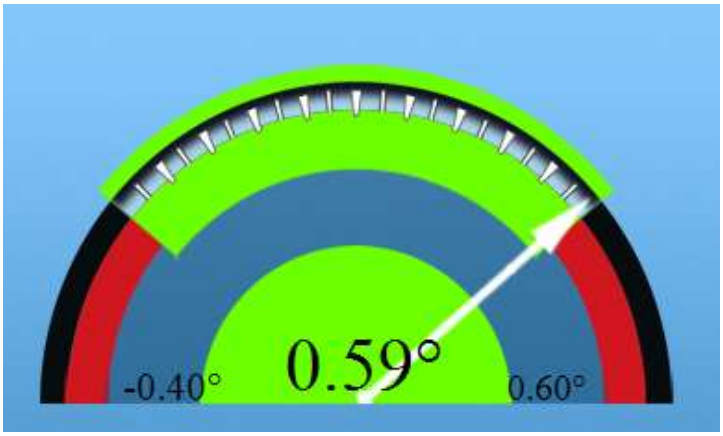
Current measuring values has big difference with standard vehicle specification



Current measuring values near the standard vehicle specification.



Current measuring values within the standard vehicle specification range.



6.1.2 Digital type status explanation

Current measuring values has big difference with standard vehicle specification

Current measuring values near the standard vehicle specification.

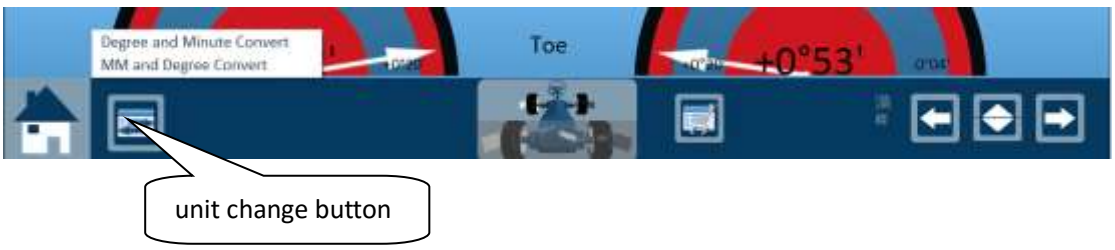
Current measuring values within the standard vehicle specification range.

6.1.3 Enlarge the adjustment values

If the operator is far away from the monitor when adjustment, the operator can click the value to enlarge it, thus will be more convenient for the adjustment. Click any place again will be back to original size.

6.1.4 Unit convert

Operator click “unit convert” button can convert the value display way, it can convert from “degree” to “degree and minute”. Also can convert Toe unit to “mm” and “inch”. Toe unit convert need to input tire diameter of the measured vehicle.



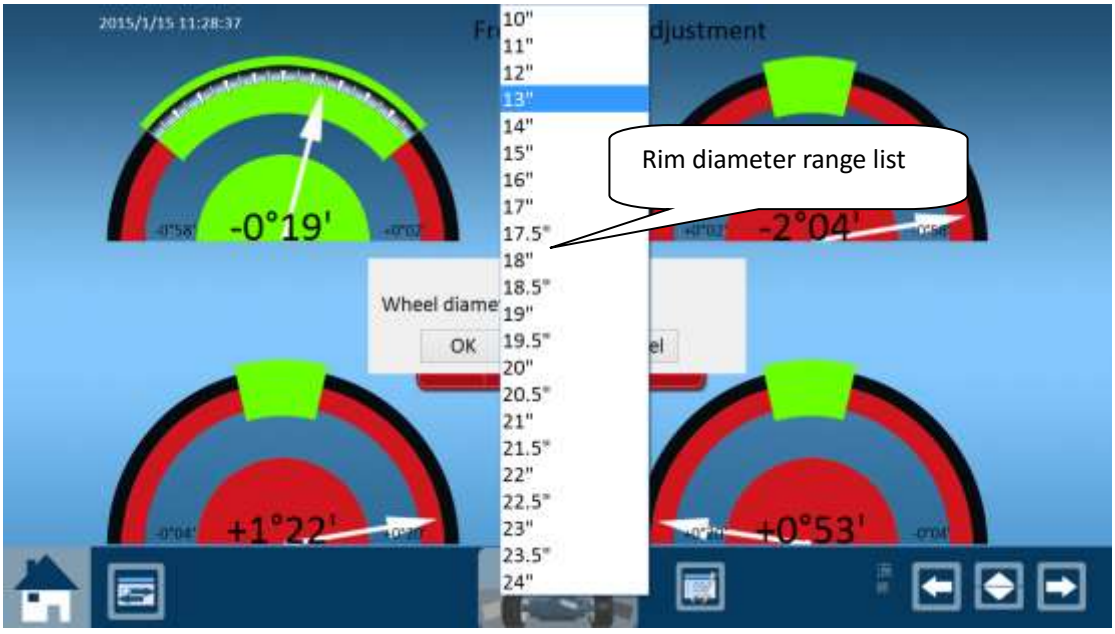
6.1.4.1 Degree and minute unit convert

Operator click the unit convert button to choose “degree and minute convert”, the system will convert the unit of adjustment value from degree to degree and minute, or from degree and minute to degree.

6.1.4.2 Toe unit convert

Operator click the unit convert button to choose “mm and degree convert”, system will appear the dialog box to require to input the wheel diameter first. And then click confirm to convert.

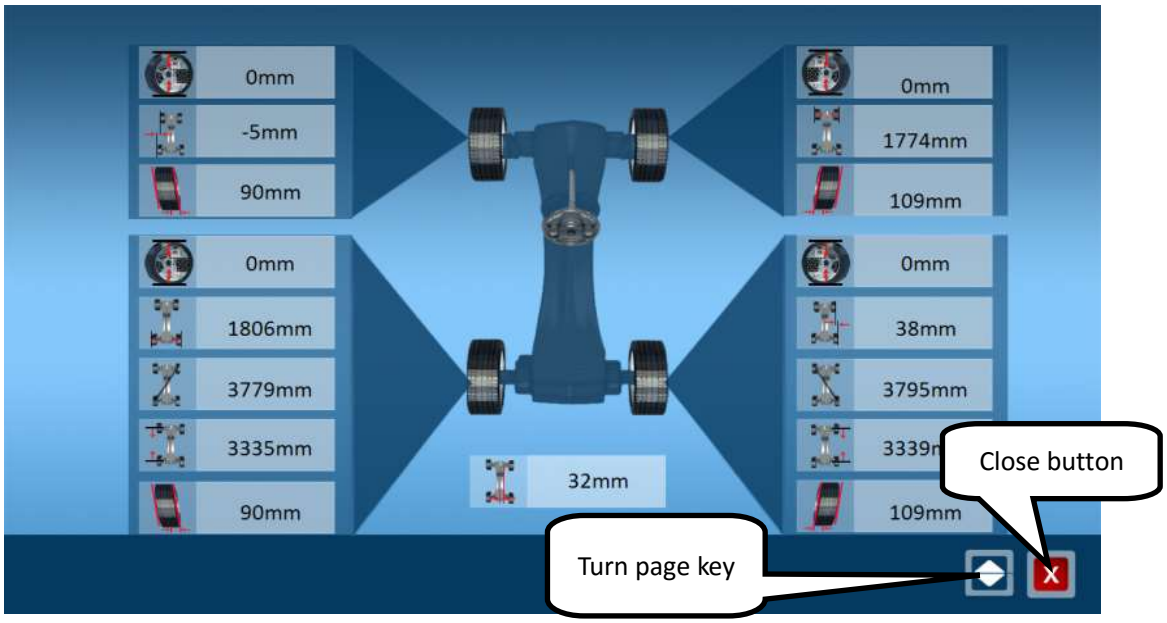
Choose rim diameter



choose rim diameter from the list

6.2 Check summary measurement values

Summary measurement values are all the measuring values after alignment, these values for the operator to judge the real situation of the measured vehicle. Click the “turn page” button or press up key of the keyboard on adjustment screen can check all the measurement values and additional values.



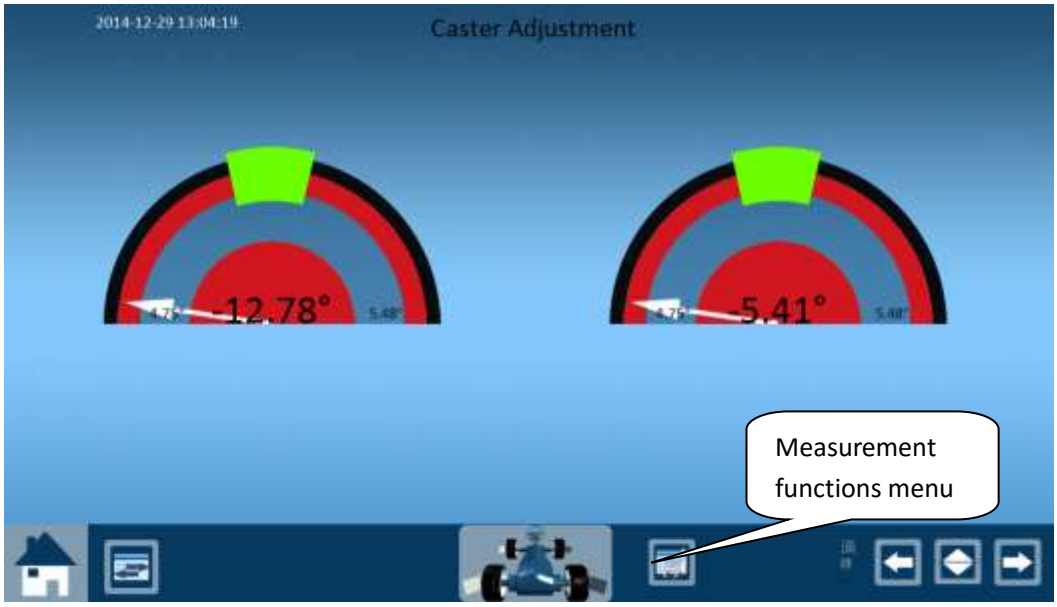
Additional data

6.3 Caster adjustment

Attentions before Caster adjustment

It must use steering wheel locker to lock the steering wheel after straighten the steering wheel by eye, also use the pedal locker to lock the pedal and pull up the handbrake.

The operator can click menu button to choose “re-measure Caster” item if wants to re-measure the Caster.



6.4 Rear wheels adjustment

Enter rear wheels adjustment screen after Caster adjustment.

Rear wheels adjustment procedure: Camber, Toe. Click next page enter individual rear wheel Camber adjustment, rear wheel Toe adjustment, thrust angle adjustment. There are lift adjustment, single wheel measurement and other functions on rear wheel adjustment screen.

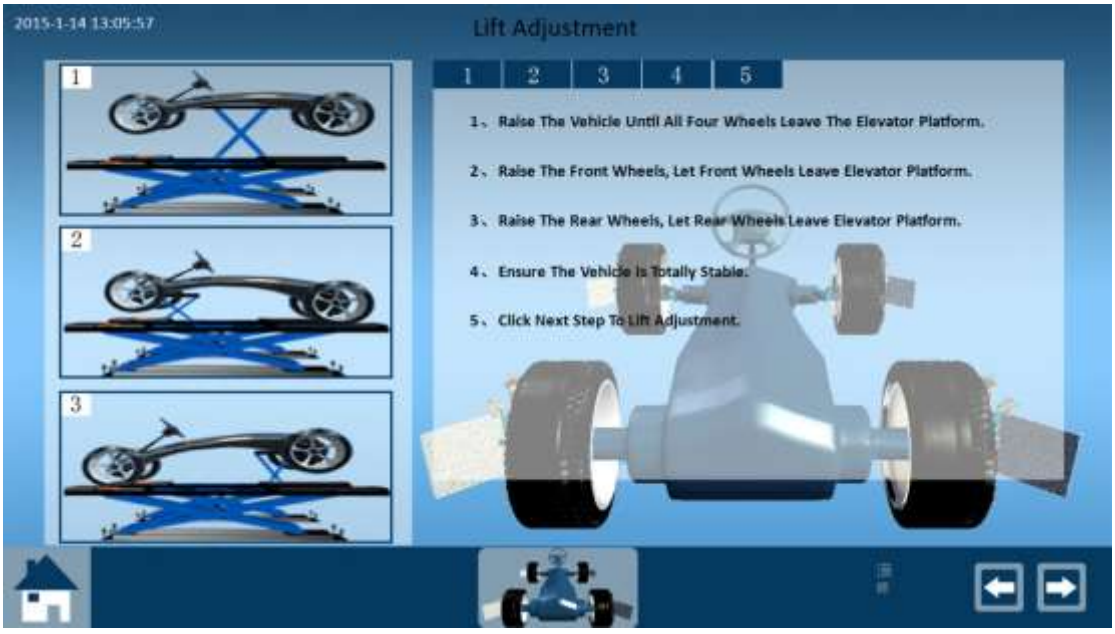
Individual adjustment of rear wheel Camber

Individual adjustment of rear wheel Toe

Individual adjustment of rear wheel thrust angle

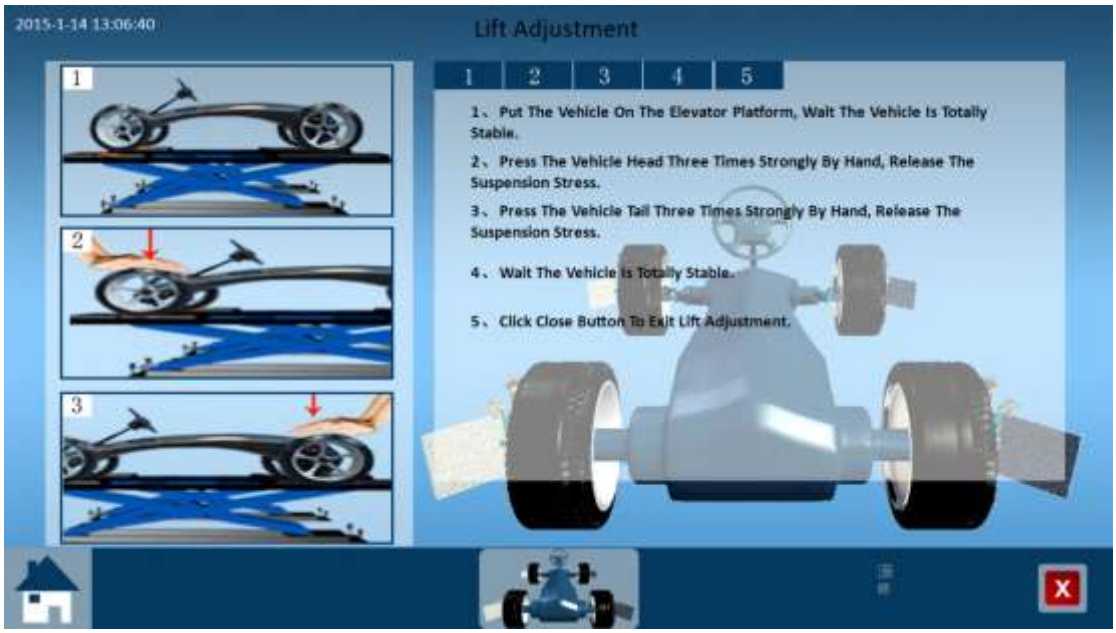
6.4.1 Lift adjustment way

Operator click adjustment menu and choose lift adjustment item to enter lift adjustment screen. Then the operator must prepare according to the indications on the screen before lift adjustment operation.



Operator can adjust based on standard specification on the adjustment screen, and click close after adjustment.

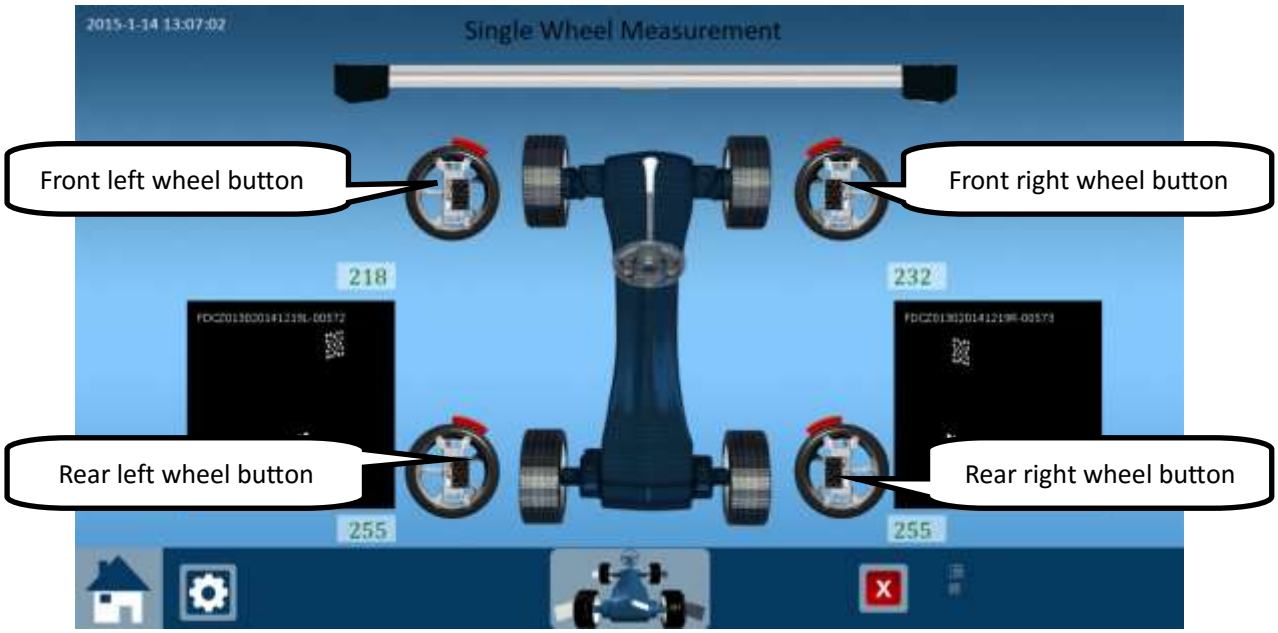
After adjustment and click close button will enter below screen, the operator must operate according to the indications on the screen. Then click close to back to adjustment screen.



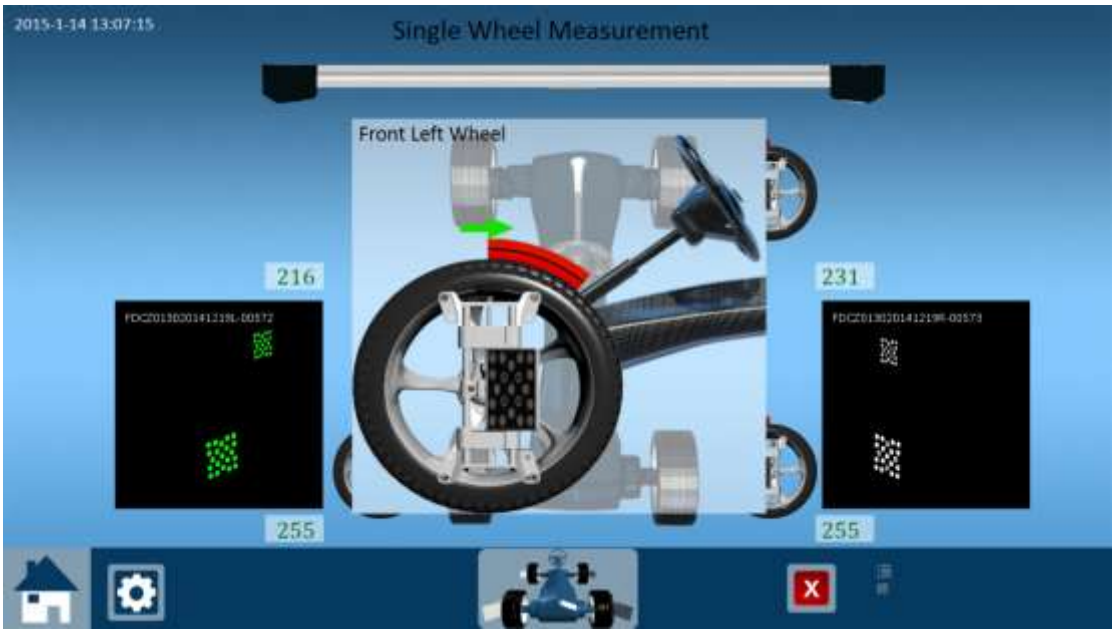
6.4.2 Single wheel measurement

If need to disassemble the tire during adjustment procedure, it doesn't need to back to measurement screen after adjustment, only need to choose "single wheel measurement" after click "adjustment function menu" on adjustment screen. Elevate the measured wheel, re-measure the wheel according to the indications on the screen.

Enter single wheel measurement screen, operator choose the wheel that need to re-measured, click the corresponding wheel on the screen to enter next step. Click close to exit.

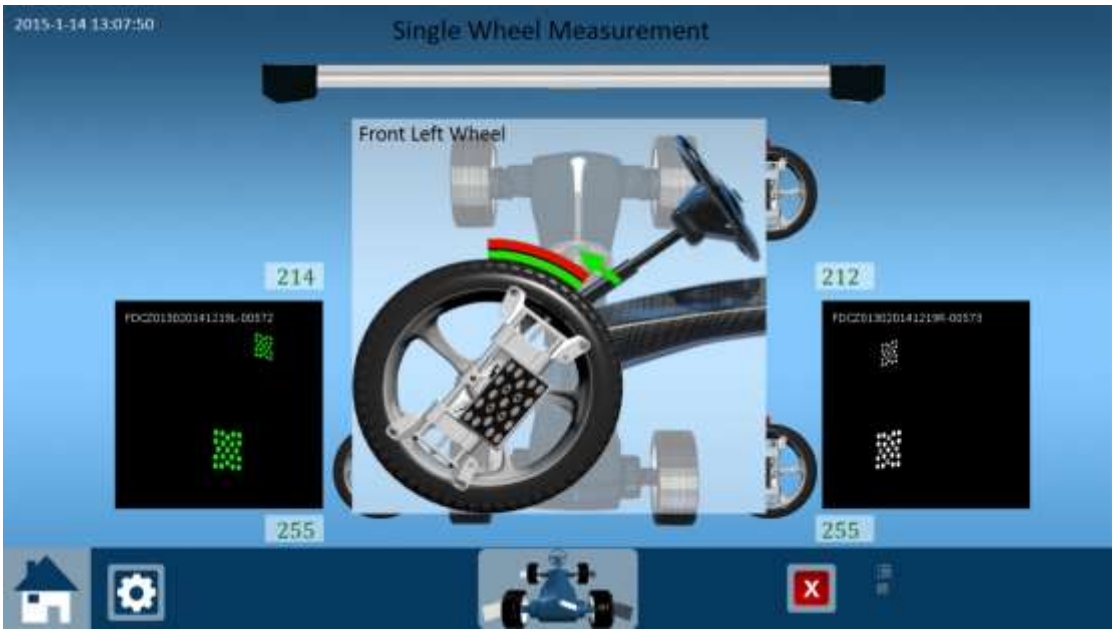


We use front left wheel for example, click front left wheel icon on the screen to enter front left wheel measurement. Operator turns the wheel to the tail direction according to green arrow indication.



Stop turning the wheel when appears STOP, and waiting for indication.

Turn the wheel to head direction when appears opposite arrow indication.



Stop turning the wheel when appears STOP on the screen, and waiting for calculating results.

It appears OK on front left wheel means front left wheel measurement is finished. Repeat the same procedure if need to measure other wheels, or click close to exit.

6.5 Front wheels adjustment

Click next step to enter front wheels adjustment screen after rear wheels adjustment.

Front wheels adjustment procedure: Camber, Toe. There are many items can be chosen after click front wheels adjustment menu. Individual adjustment function is the same as rear wheels adjustment.

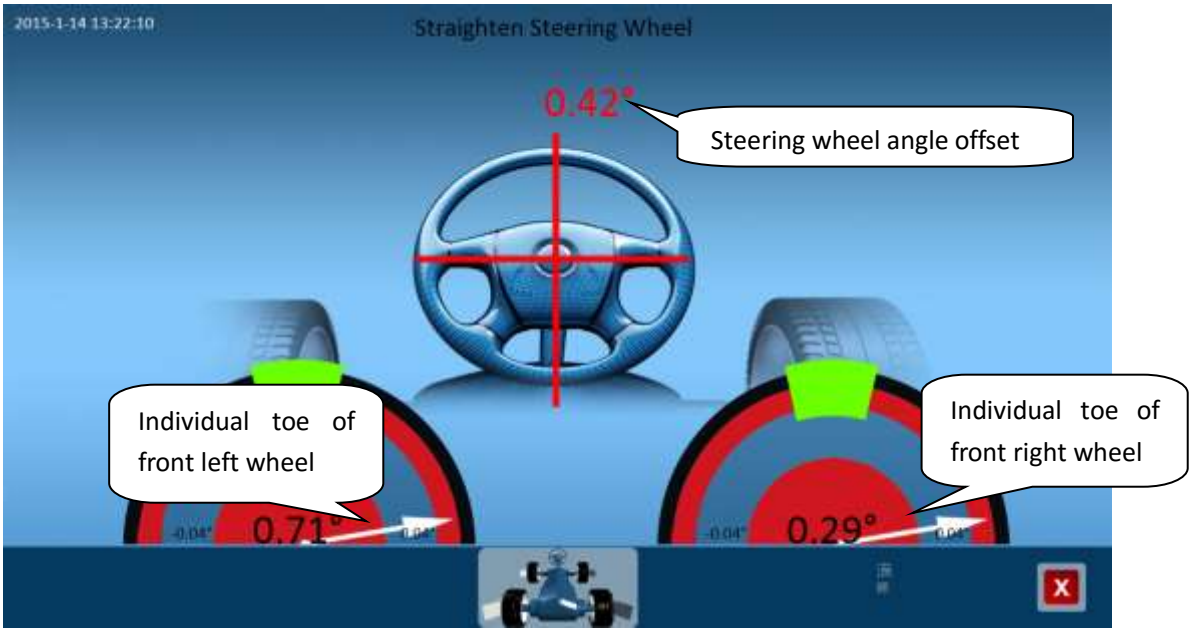

Front Wheels Adjustment
Left Caster
Right Caster
Adjustment of front left Camber
Adjustment of front right Camber
Camber
Total Toe of front wheel
Individual Toe of front left
Individual Toe of front right
Total Toe
Toe
Unit change
Adjustment function menu
Turning page key


Front Wheels Adjustment
Camber
Total Toe
Toe
Straighten Steering Wheel
Toe Lock Adjustment
Single Wheel Measurement
Lift Measurement
Front wheels adjustment functions menu

6.5.1 Front wheels adjustment-steering wheel adjustment

Choose “straighten steering wheel” item on the front wheels adjustment screen.

Enter “steering wheel adjustment” screen, operator must adjust the value very close to 0 based on the values display on the screen, then means the steering wheel on the center position.

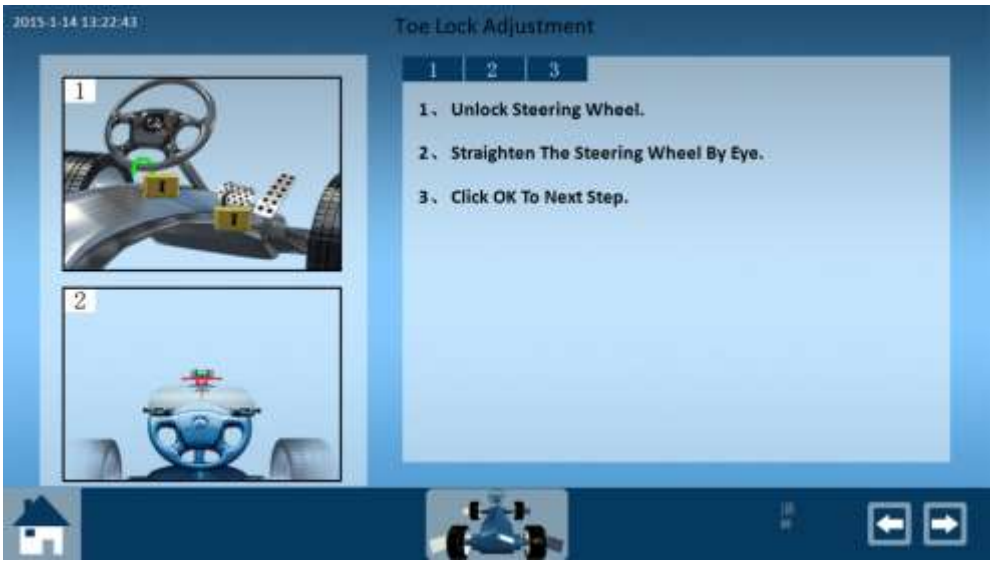


6.5.2 Front wheels adjustment-Toe lock adjustment

Choose “Toe lock adjustment” item on the front wheels adjustment screen. Toe lock adjustment used for the vehicle steering link and bar adjustment position is narrow, not easy to adjust.

Operation way: turn the wheel to enlarge the space to adjust steering link and bar.

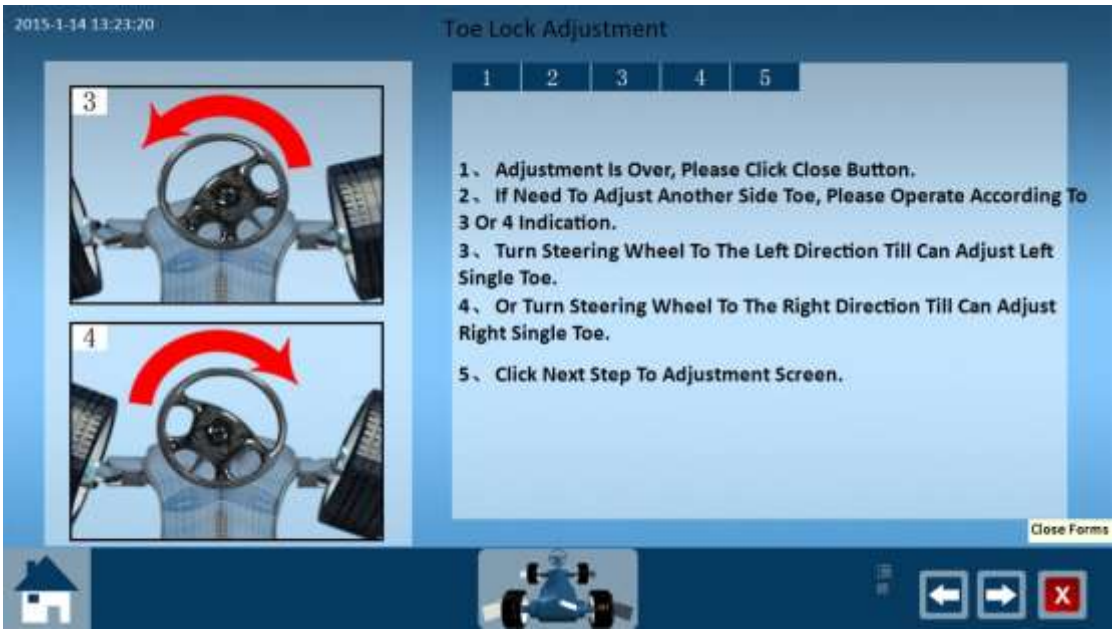
Enter “Toe lock adjustment” screen and operate according to the indications on the screen, then click next step.



Still operate according to the instructions on the screens, and click next step.

Turn steering wheel according to the standard specification to adjust one side Toe, then click next step after finished.

Operator can continue to adjust the other side Toe after one side Toe adjustment finished. Operate according to the indications on the screens. Click close if adjustment finished.

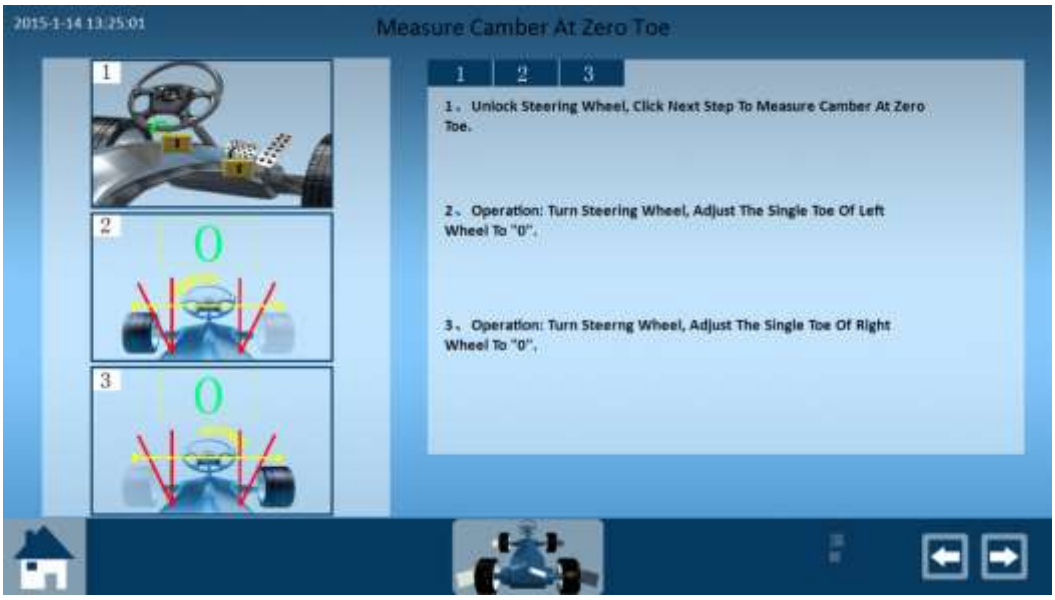


After Toe adjustment, operator still need to operate according to the indications on the screens, and click close button.

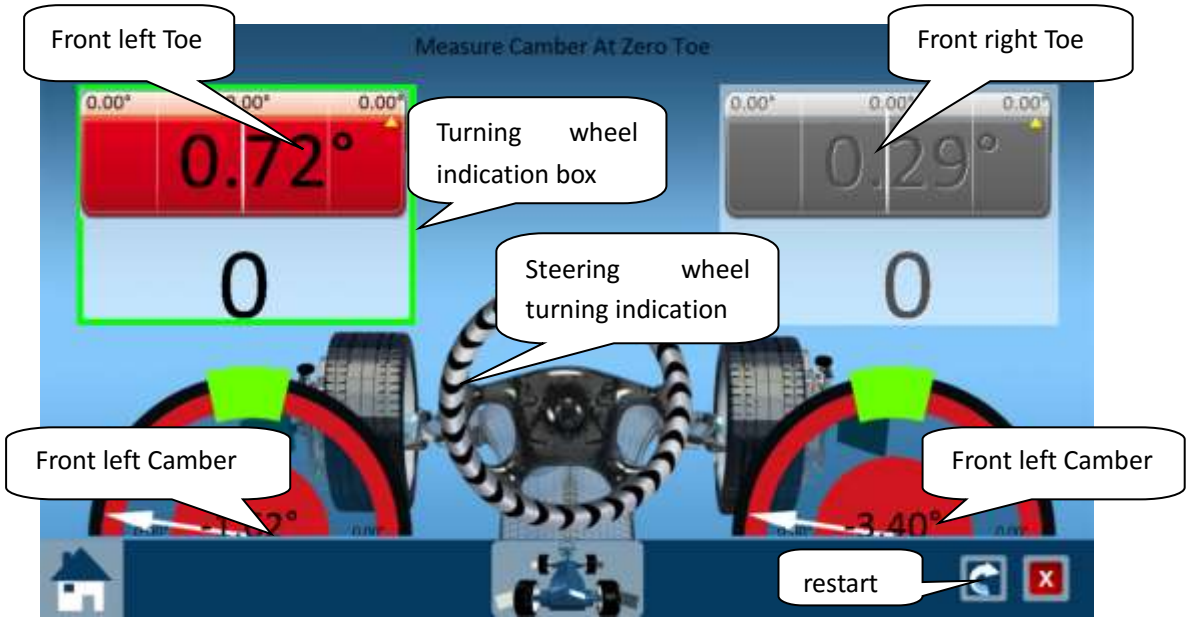
6.5.3 Front wheels adjustment-Measure Camber at zero Toe

Operator choose “Measure camber at zero Toe” function on the adjustment screen. This function used for Caster value is too large, Toe value change will affect Camber value during the adjustment, so the correct Camber value should when Toe is zero.

Enter “Measure Camber At Zero Toe” function, operate according to the indications on the screen.

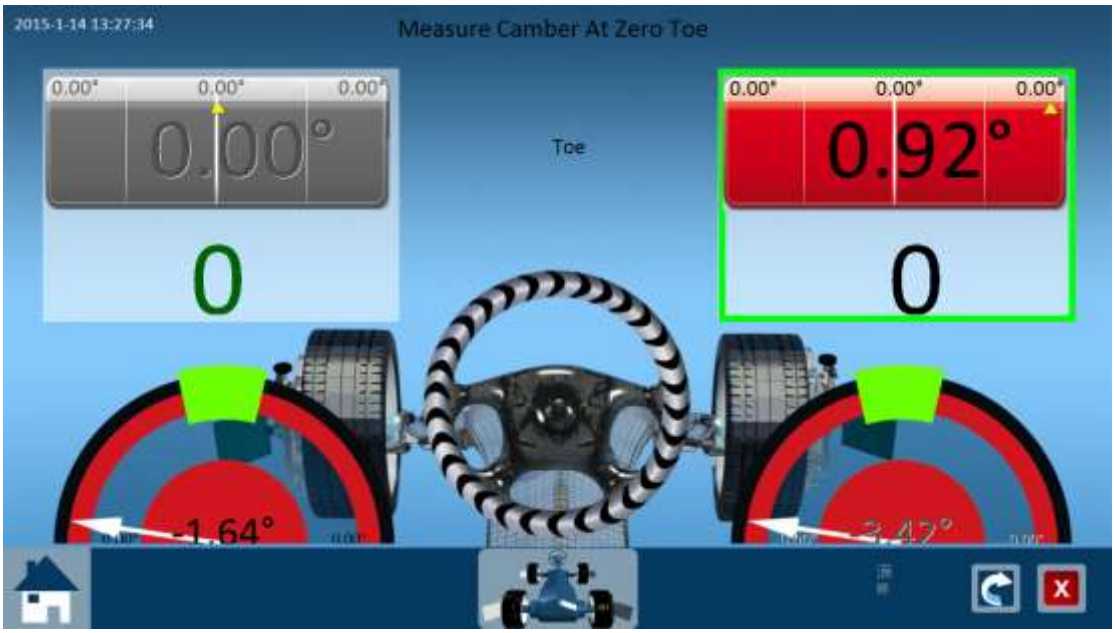


On the adjustment screen, operator turn the steering wheel according to the screen indication, let the Toe of front left is very near 0.



When operator turn the steering wheel to near 0, the turning indication will stop, and screen will appear STOP and steering wheel on the screen turn green. At this time, operator must stop turning the steering wheel and wait.

After waiting, the screen display Camber of front left update finished. The turn steering wheel indication transfers to front right wheel. The operator repeats the same operation procedure as front left wheel.



When finished, click close to enter next screen. Operate according to the indications on the screen and click close button to back to adjustment screen.

Front right wheel measurement finished, click close button to exit.

Enter “Measure Camber at Zero Toe” screen after exit. Operation according to the indications on the screen and click close button back to the adjustment screen.

Buttons explanation

	Back to homepage
	Operation manual
	Unit convert
	Camera take photos frame rate per second

	You need
	Search target
	Additional measurement option
	Previous step
	Turn page
	Next step
	Fast forward, skip Caster measurement

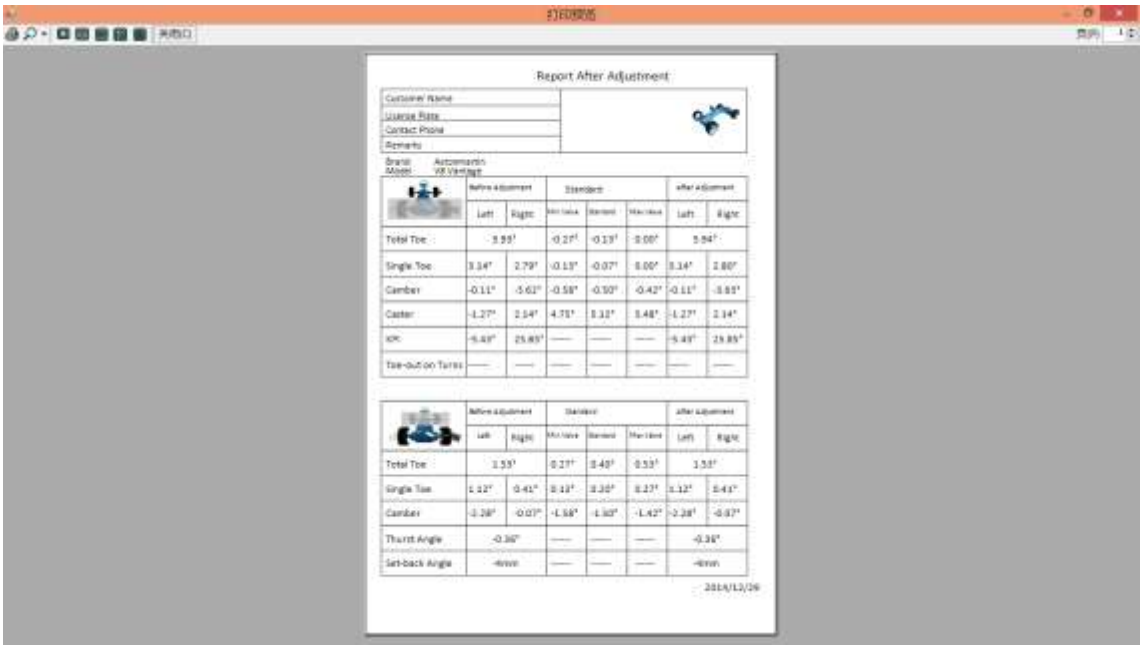
Chapter 7 Report After Adjustment and Printout Paper

7.1 Report after adjustment

Operator click next step on front wheels adjustment screen will enter report after adjustment screen. There are values before adjustment and after adjustment, also the standard specification on this screen.

7.2 Printout

Click “printout” button, the system will appear printout report screen. operator can check the measurement results or can use printer to print it out.



Chapter 8 System Maintenance

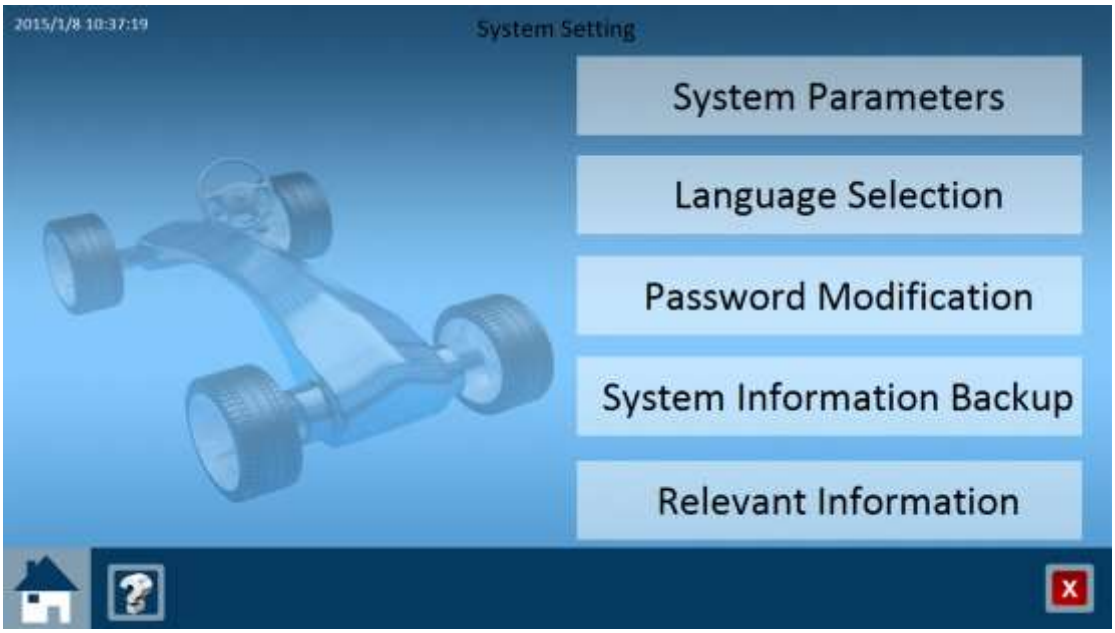
There is “system maintenance” button on each software program screen, operator can enter “system maintenance” to set system parameters or make calibration.

System maintenance screen include: system setting, camera calibration (RCP), camera view, and vehicle data adding.

Note: only the professional people can do the relevant setting. The wrong settings will lead to wrong measurement results. So please read this chapter instructions carefully.

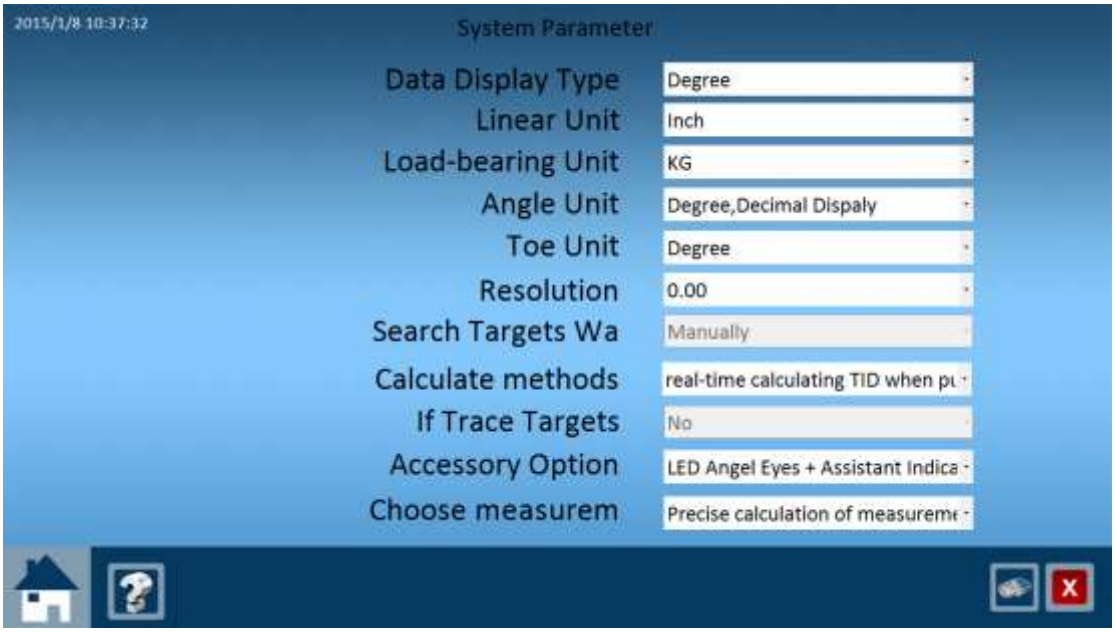
8.1 System setting

Click “system setting” to enter the setting screen. It includes: system parameters, language selection, password modification, system information backup, and relevant information.



8.1.1 System parameter

On “system parameter” screen, choose the modified item and click save button.

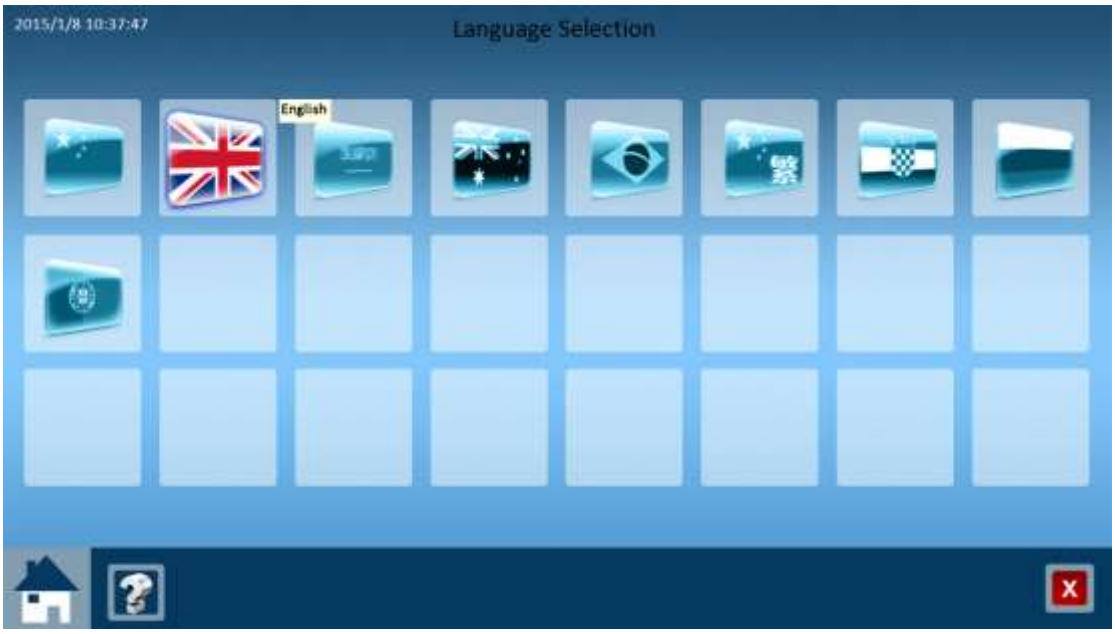


Items on system parameter screen explanation:

- Data display type： degree,decimalism,degree and minute, degree, minute.
- Linear unit: inch, mm.
- Load-bearing: KG, pound.
- Angle unit: 1.99°,1°59’.
- Toe unit: degree, MM, inch.
- Resolution: 0.00, 0.0.
- Search target way: manually, automatically.
- If trace targets: No, Yes.
- Accessory option: LED angel eyes, assistant indicator.
- Choose measurement way: precise calculation of measurement results, quick calculation of measurement results.

8.1.2 Language selection

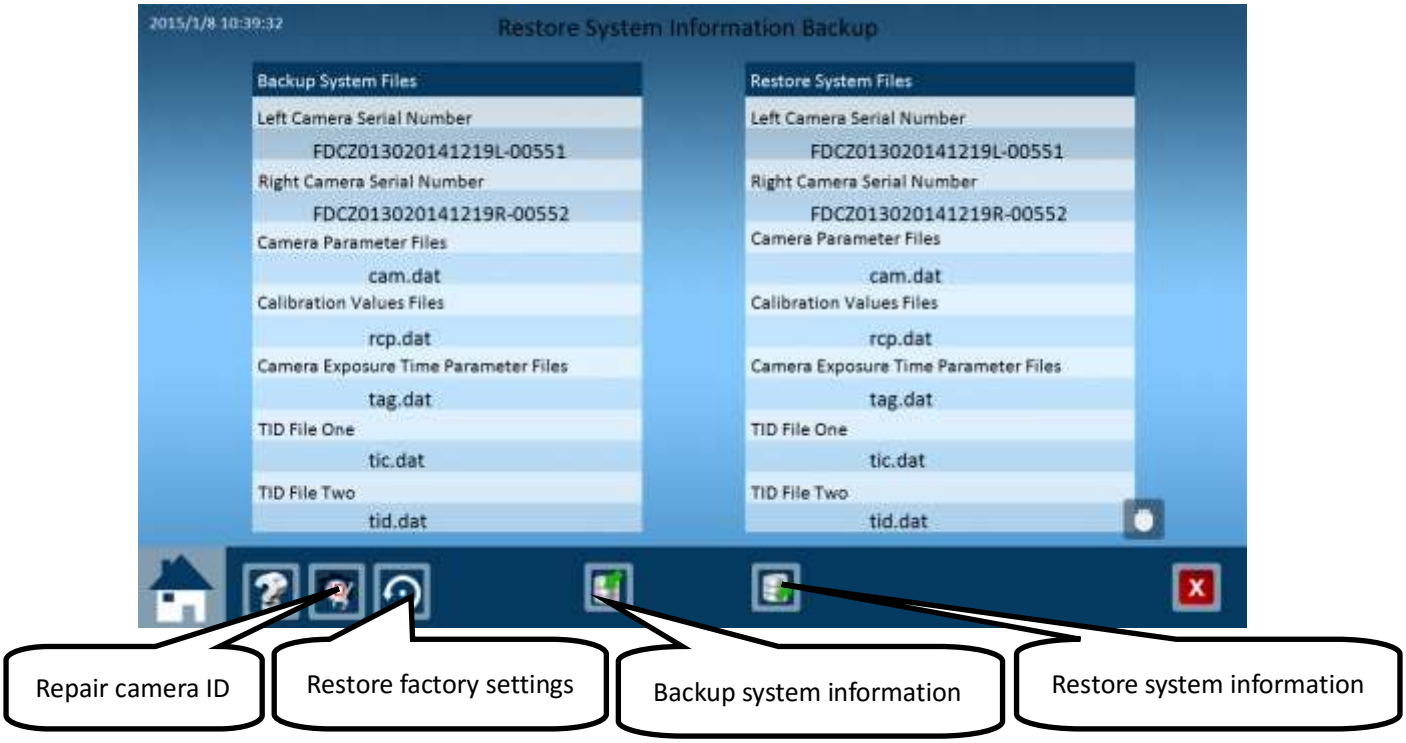
Click the flag icon to choose the language that customer need.



8.1.3 Password modification

8.1.4 System information backup

Customer can backup camera ID, parameter files and calibration files on “system information backup” screen. It needs to input password 12345678 to restore the backup files.



Repair camera ID: when the ID of cameras are broken, system will indicate “the RCP file doesn’t match camera ID, and the “repair camera ID” button will flickering in red and white color. Customer can click button to repair the camera ID automatically if doesn’t change the new cameras.

Restore factory settings: restore the camera gain, exposure time and other information that set in the factory.

8.1.5 Relevant information

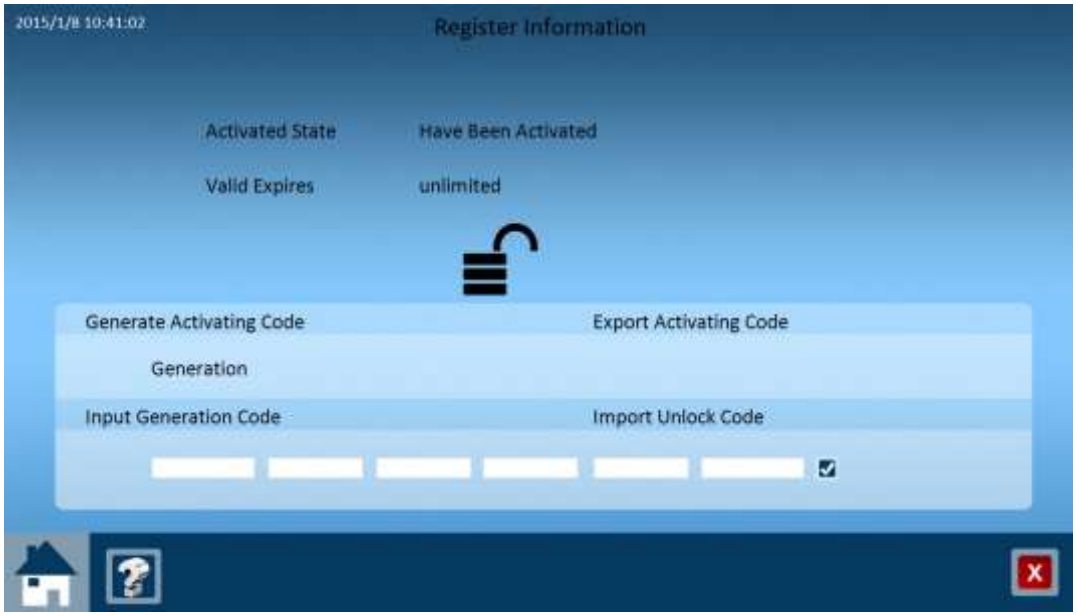
Relevant information include: equipment information, register information and customer information.

8.1.5.1 Equipment information

Equipment information display the current equipment's camera ID, hardware ID and software version and driver version.

8.1.5.2 Register Information

Register information display the uses-permission and valid date.



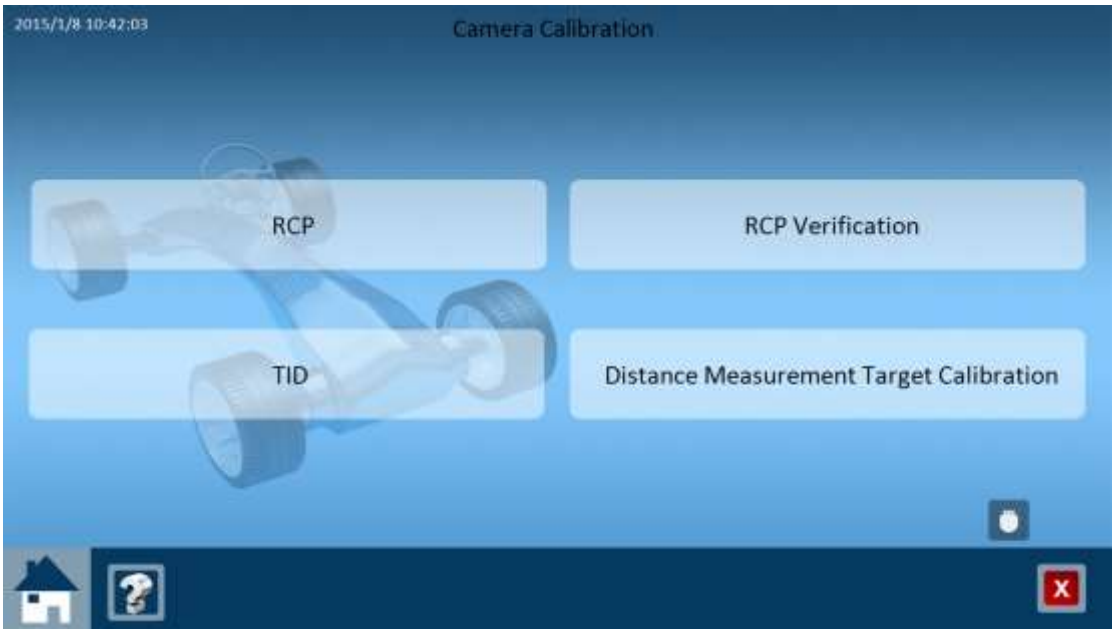
Activated state: the uses-permission of the customer.
Using expires: display the next expires date. If display “unlimited” means the equipment unlock forever.
Generate activating code: it will generate a serial codes when using date expired .
Import unlock code: the unlock code can import as TXT file.
Input generating code: the operator input this code will unlock the equipment.

8.1.5.3 Customer information

Customer can add LOGO and their information on homepage and printout page.

8.2 Camera calibration

Click “camera calibration” on “system maintenance” screen can enter camera calibration screen. It includes: RCP (double camera calibration),RCP verification, TID and distance measurement target calibration. The password is 12345678.

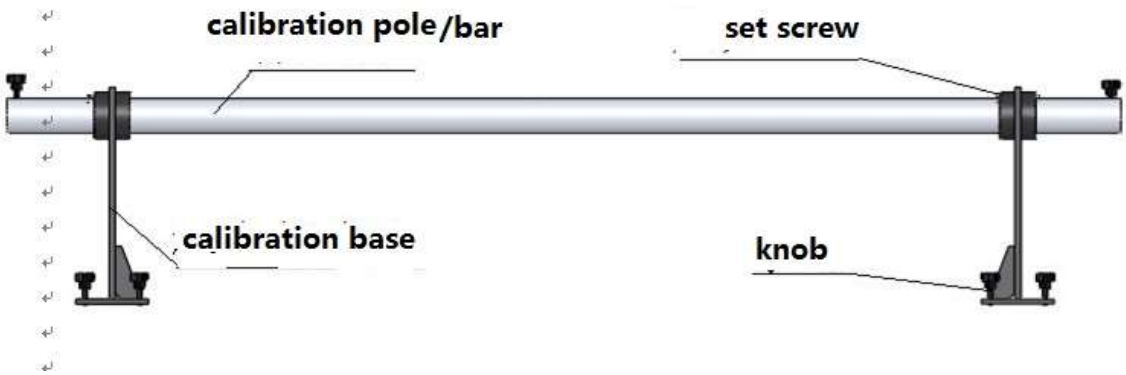


8.2.1 RCP

RCP is one of the ways to calibrate the relationship between left camera and right camera. The customer need to purchase special 3D calibration bar from factory if want to do RCP of wheel alignment.

Calibration bar installation:

Screw the M6 set screws in the calibration bar, move the calibration bases from two sides, use inner set screws to locate, then screw in the set screws to locate the calibration base, at last, screw the M8 knobs to the corresponding position. See below photo for reference.

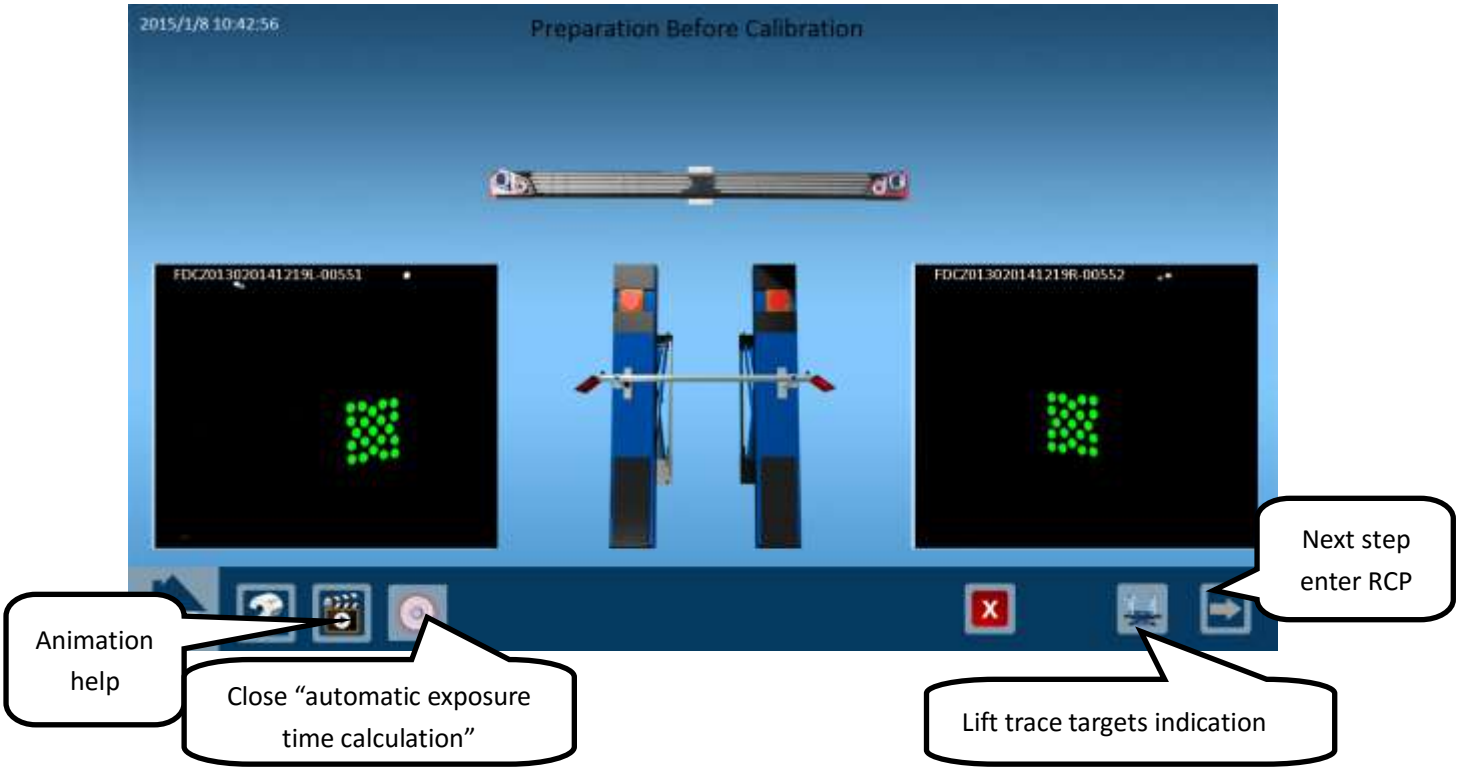


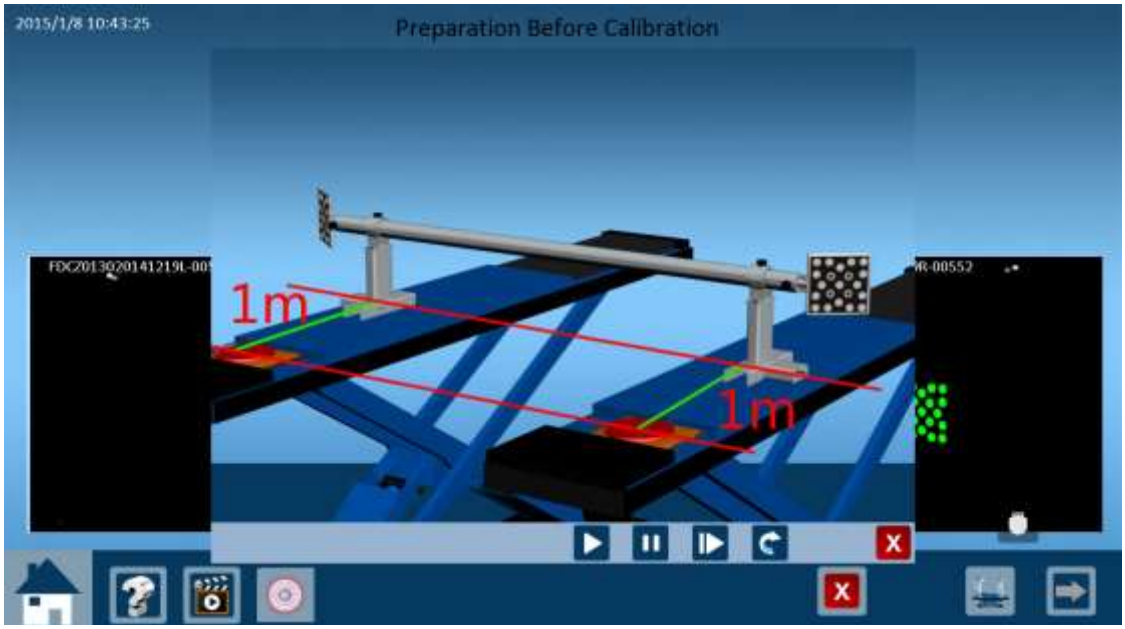
8.2.1.1 Confirm the targets position

1. Operator must trace the targets to confirm the targets position. Use rear targets as calibration target. So put the calibration bar with two rear targets on 1m position behind the center of turntable, the center of the targets must be parallel with camera beam, also the targets must be vertical to the ground, then lock the calibration bar tightly. Can click animation help for reference.

2. Operator can choose close “automatic exposure time calculation” during calibration procedure, and change as adjust the gray values of

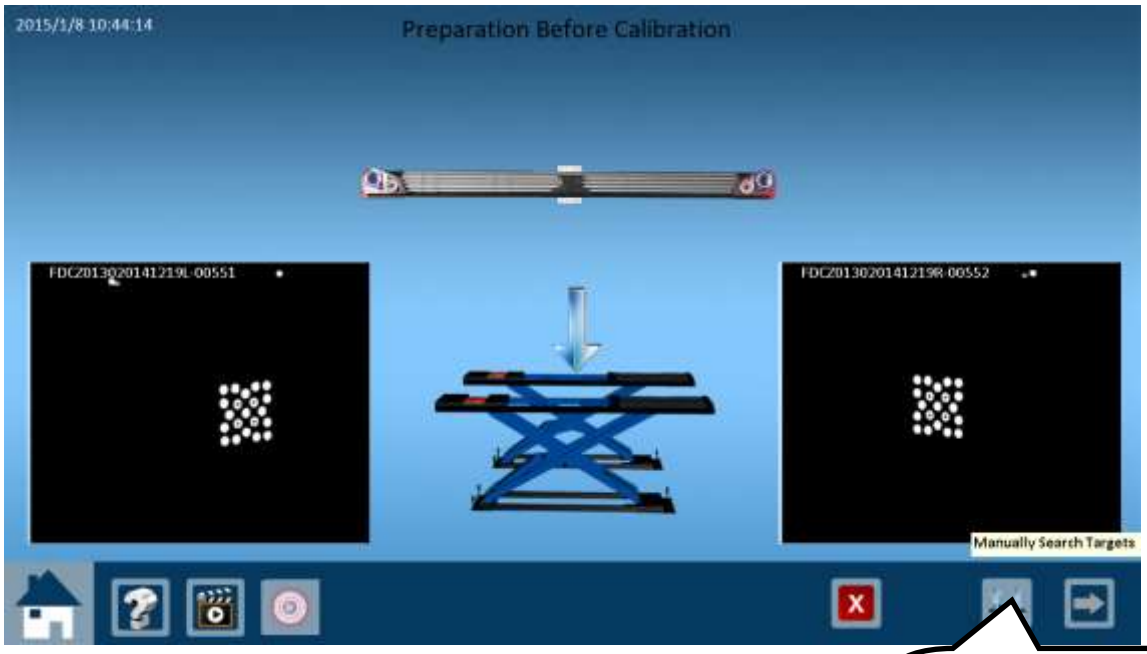
targets manually. Operator can choose this option when the light environment has large change.



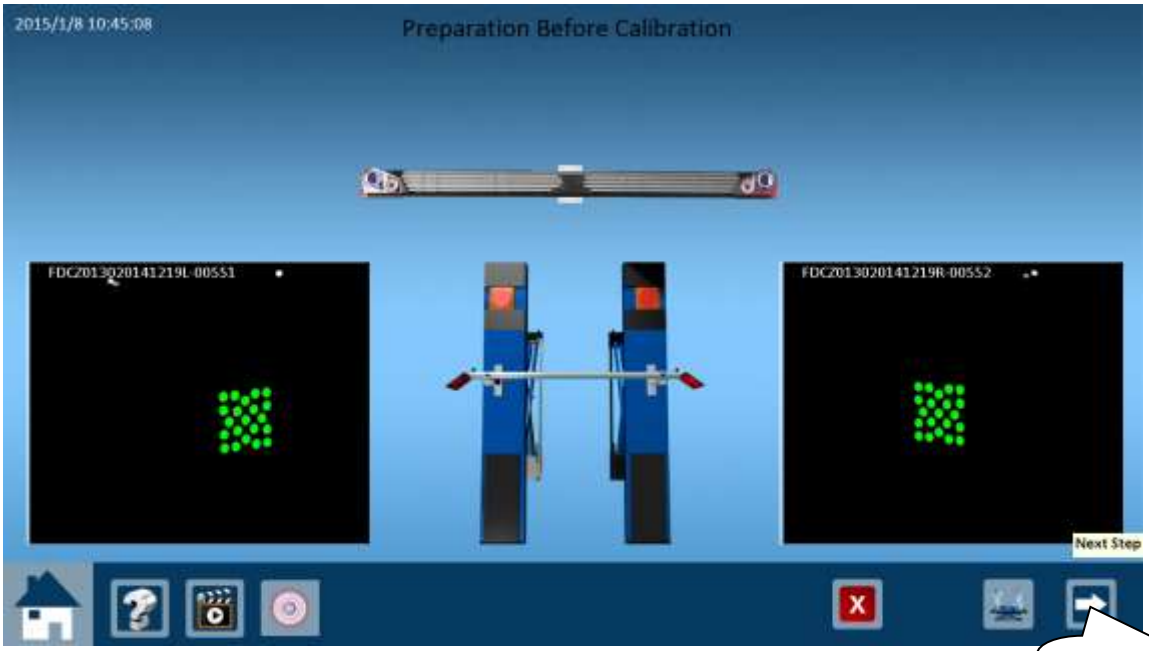


animation indication of calibration bar position

Fixed version 3D alignment must adjust lift height to be suitable for the targets view field in the camera, make sure the targets display on the software screen are in green color.



adjust lift height to trace targets indication

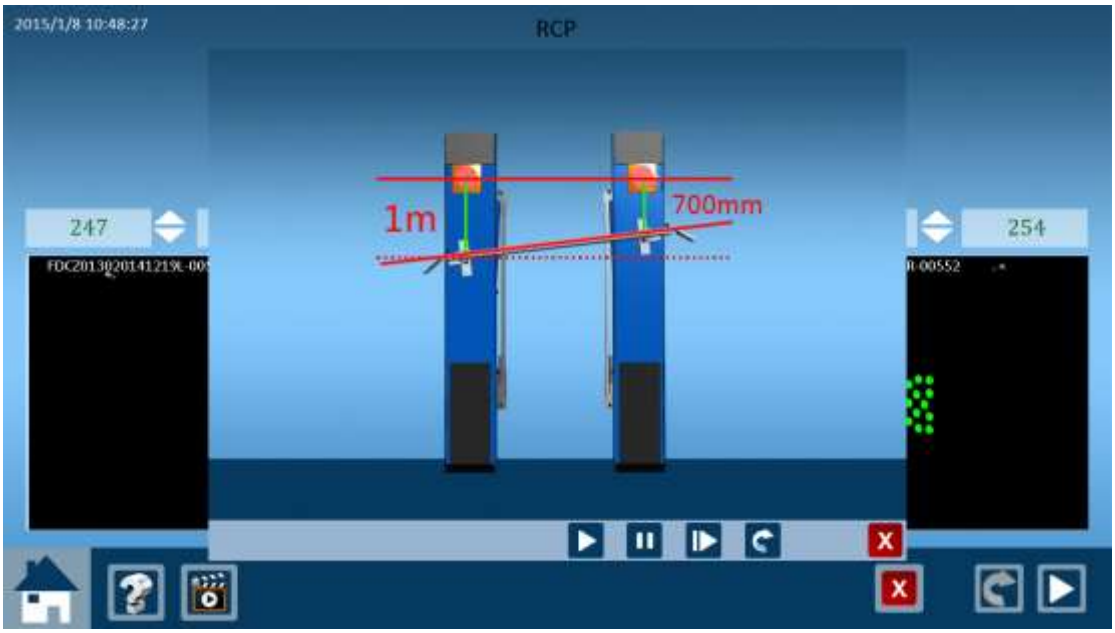


Change to white color

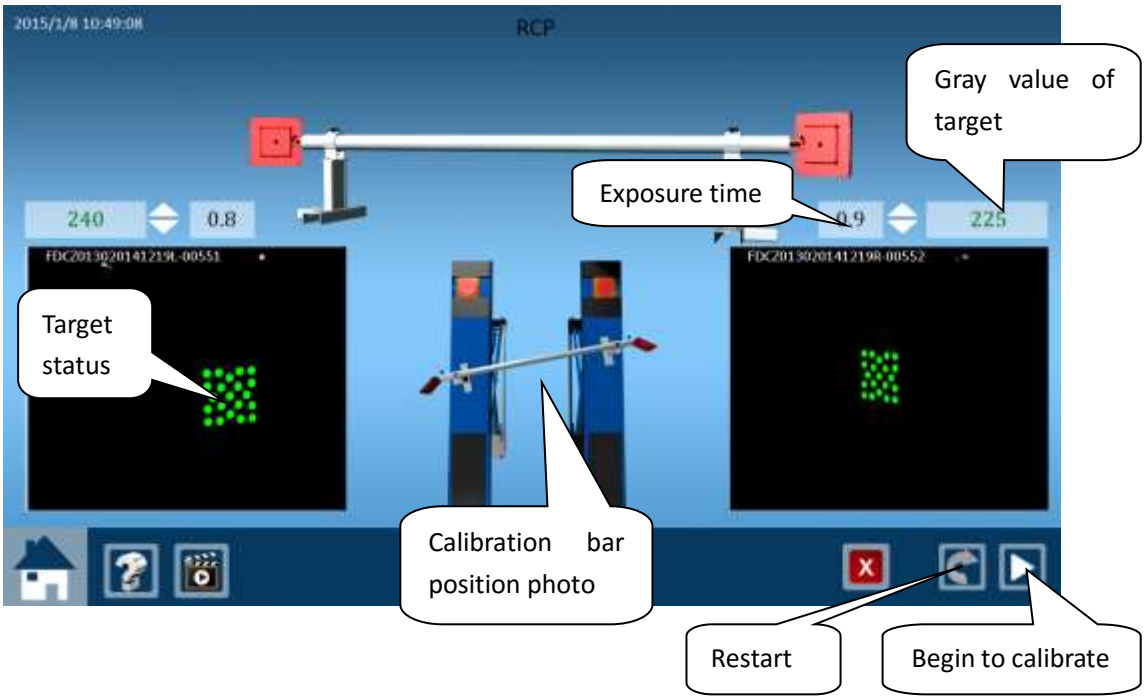
When the “next button” color from gray to white means targets trace finished, can continue to next step.

Automatic version 3D alignment can click “trace targets automatically” button to let the system adjust the targets view field position automatically, or click “trace targets manually” button to choose keyboard or press key to adjust camera beam height to adjust the targets view field position.

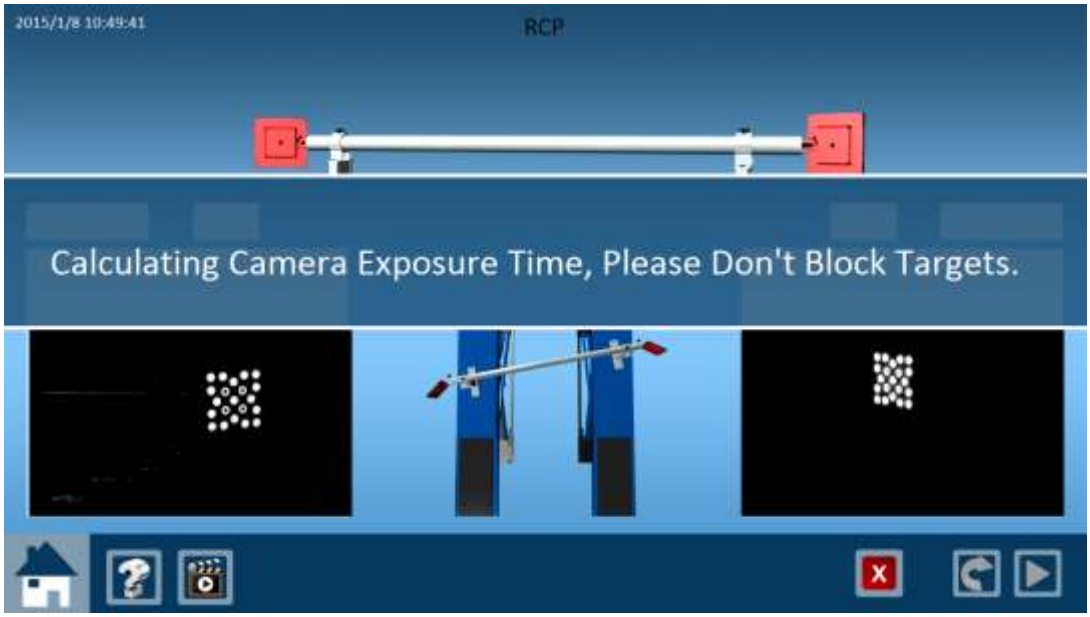
8.2.1.2 Calibration step 1



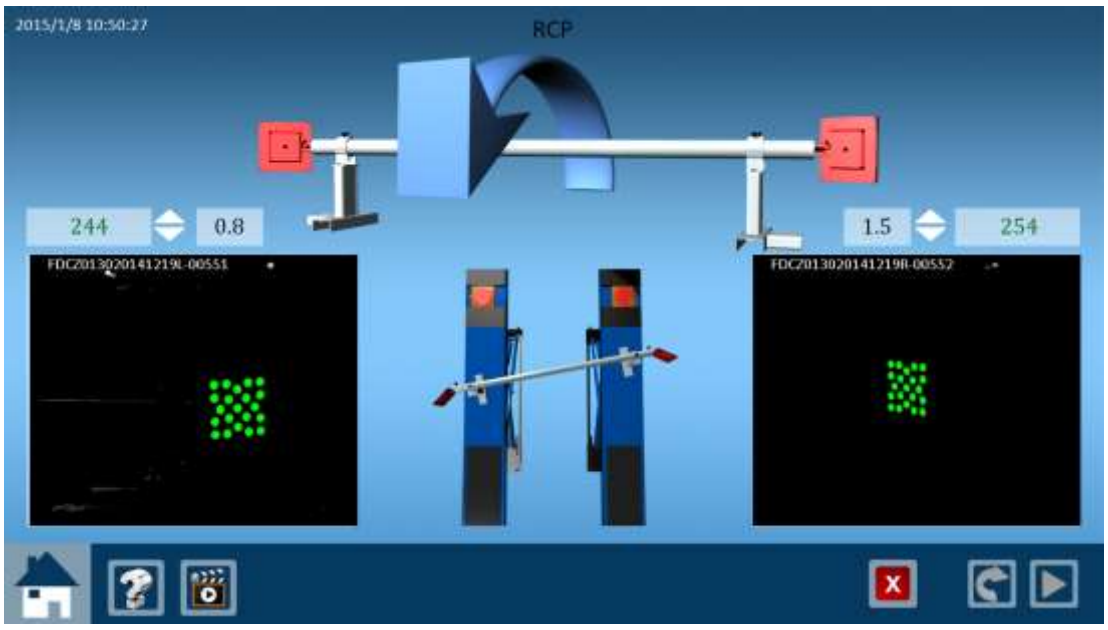
After trace targets successfully, enter next step to “RCP” screen. Operator need to move the right side of calibration bar forward about 300mm, left side keep the original position. Make sure the two targets on the calibration bar are vertical to the ground, and prepare to calibrate.



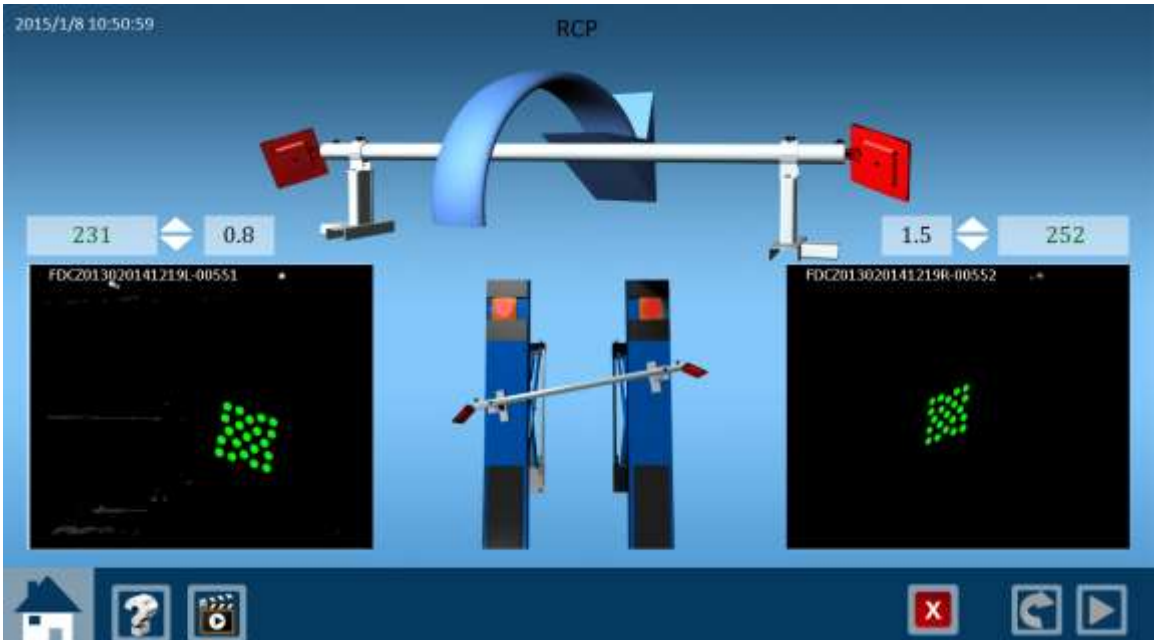
If the gray value of targets out of standard range, operator can change the gray value of targets through adjust exposure time!!



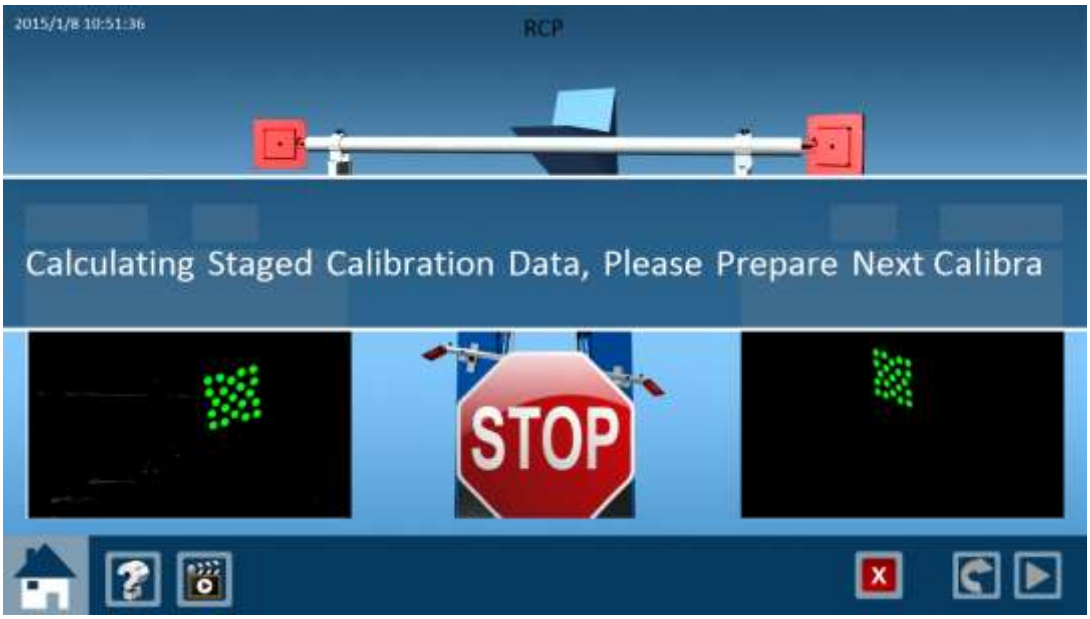
Click “begin to calibrate” button, the indication “calculating camera exposure time, please don’t block targets” appears on the screen.



Turn the calibration beam slowly to the vehicle tail direction according to the animation indication.

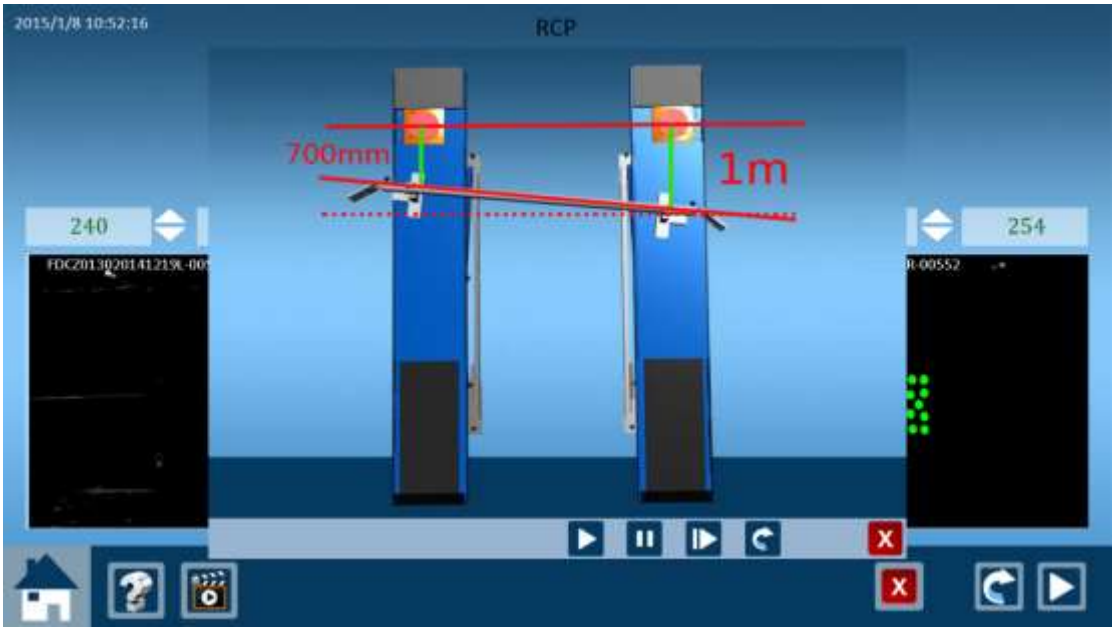


Turn the calibration beam slowly to the vehicle head direction when the arrow animation on the screen to vehicle head direction.



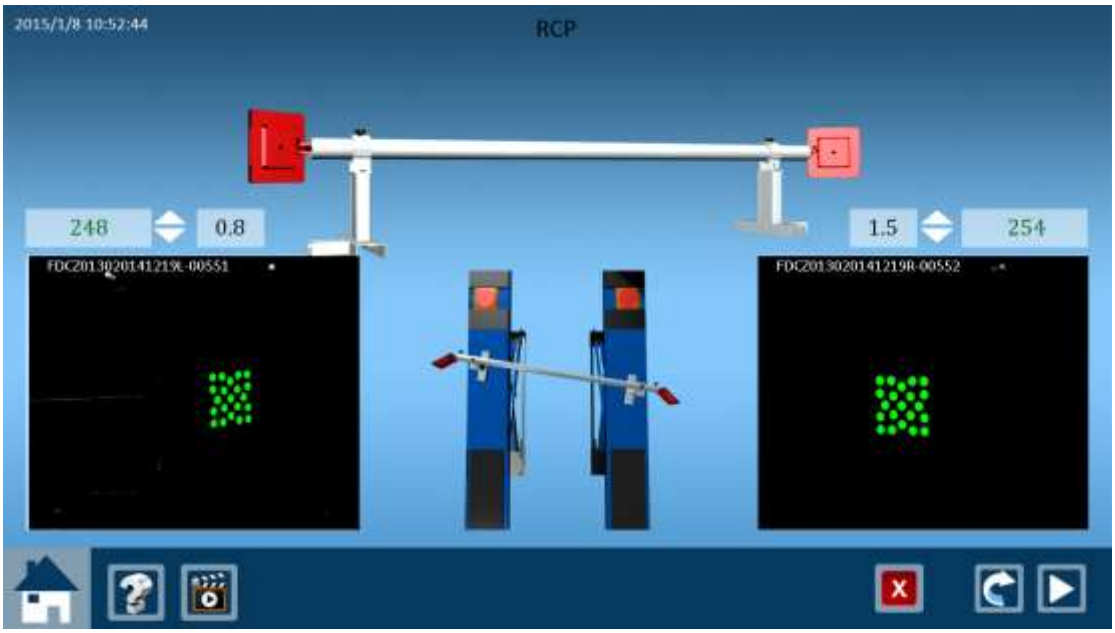
Turn calibration beam to head direction till the screen appear STOP and stop turning. The screen will indicate “calculating staged calibration data, please prepare next calibration”, at this time, operator can move the calibration bar to prepare the next calibration step.

8.2.1.3 Calibration step 2



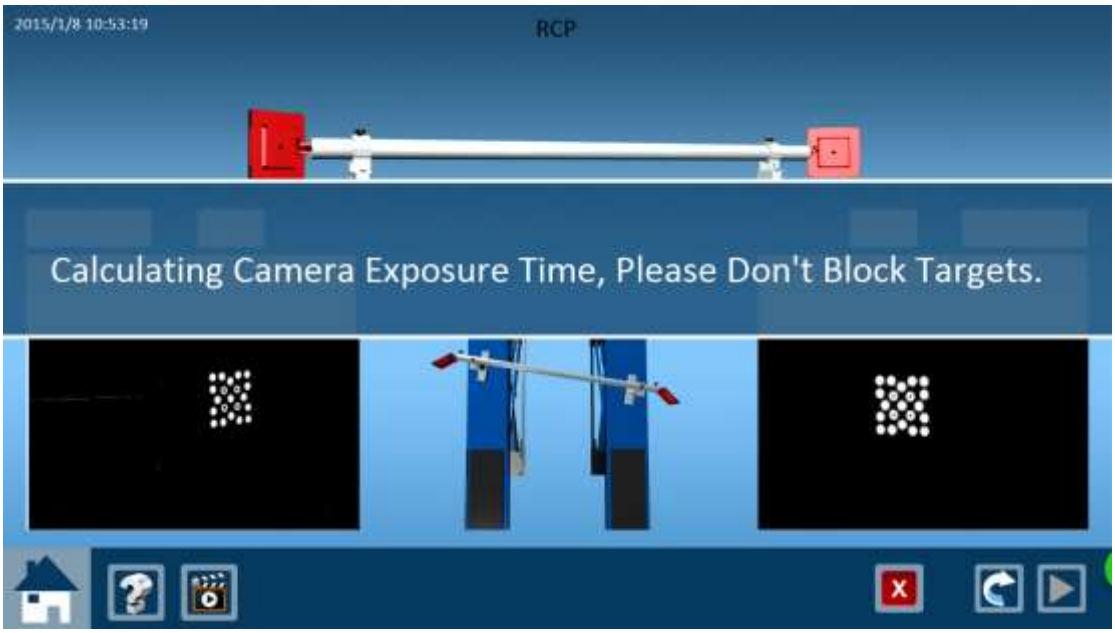
After calibration step 1 finished, operator need to move the right side of calibration bar backward about 300mm, back to original 1m position,

and then move the left side of calibration bar forward about 300mm. Make sure the two targets on the calibration bar are vertical to the ground, and prepare to calibrate.

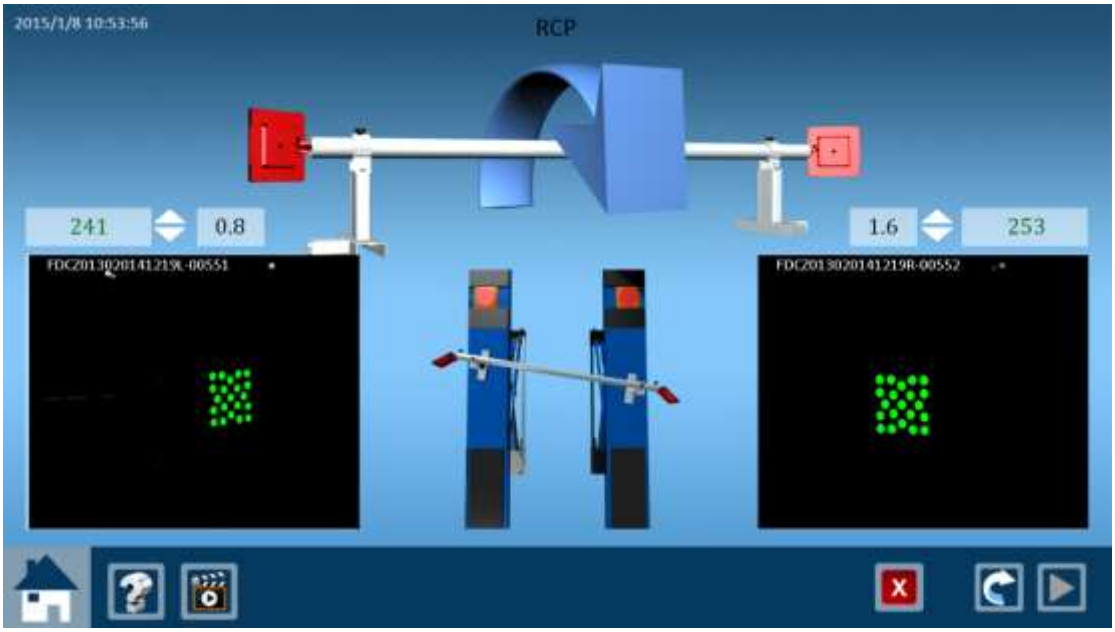


Click next step to begin second step calibration.

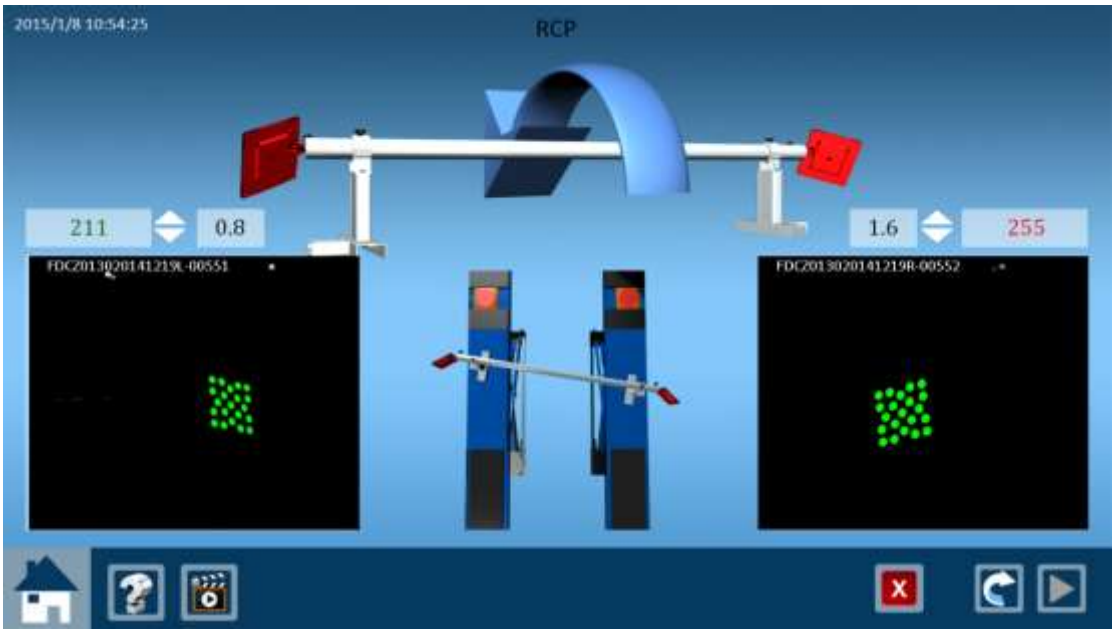
If the gray value of targets out of standard range, operator can change the gray value of targets through adjust exposure time!!



Click “begin to calibrate” button, the indication “calculating camera exposure time, please don’t block targets” appears on the screen.



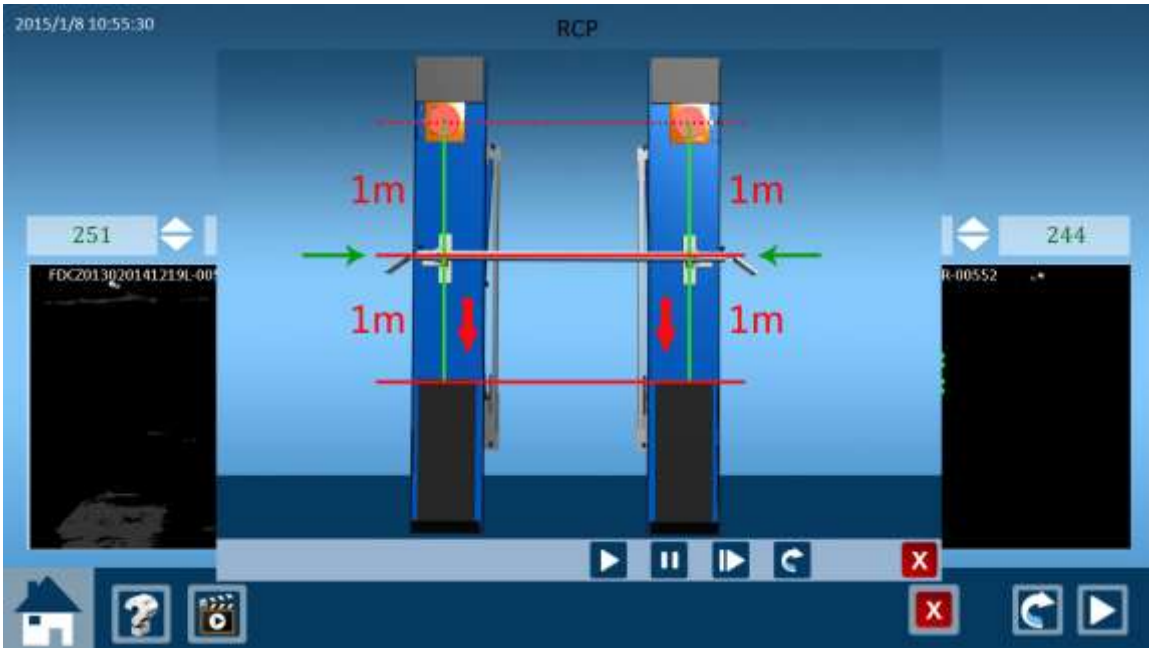
Turn the calibration beam slowly to the vehicle tail direction according to the animation indication.



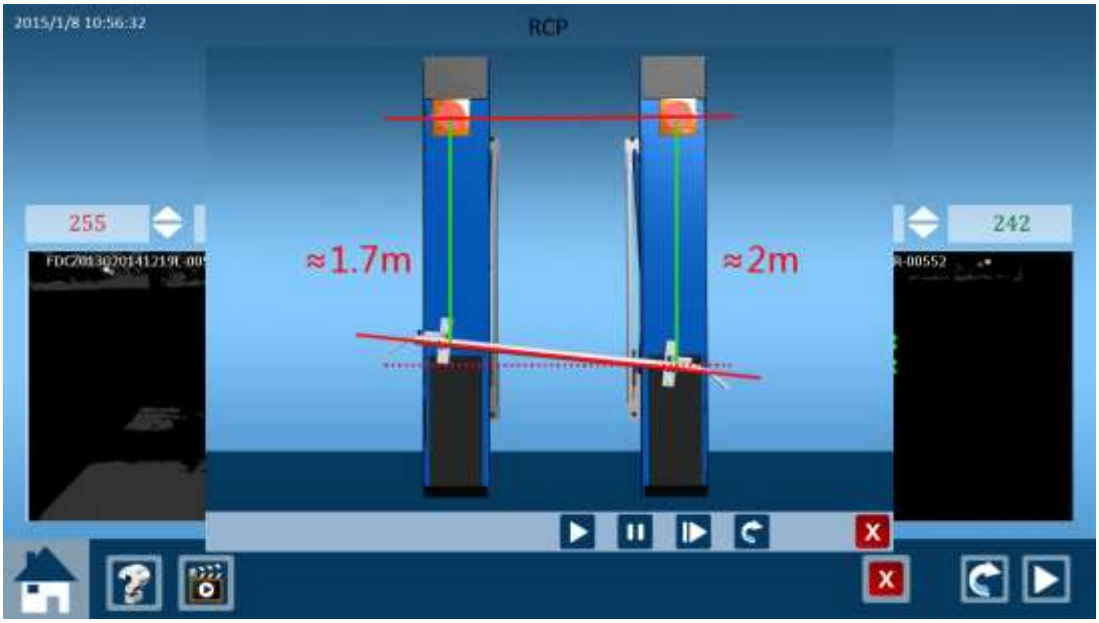
Turn the calibration beam slowly to the vehicle head direction when the arrow animation on the screen to vehicle head direction. When the screen appears STOP, the operator must stop turning the calibration beam.

Turn calibration beam to head direction till the screen appear STOP and stop turning. The screen will indicate “calculating staged calibration data, please prepare next calibration”, at this time, operator can move the calibration bar to prepare the next calibration step.

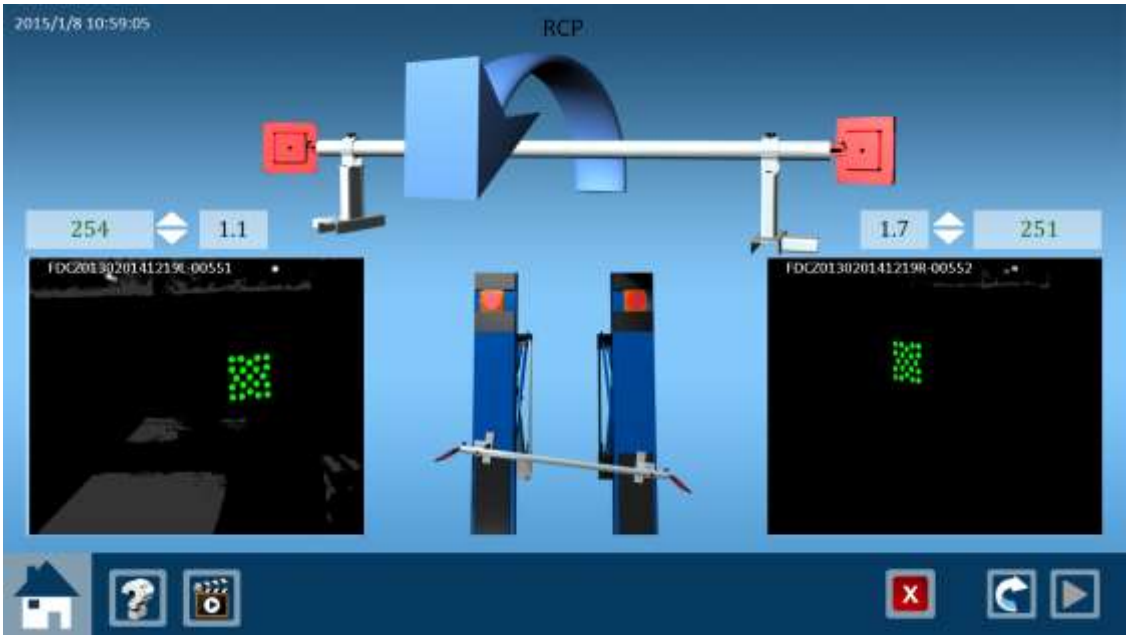
8.2.1.4 Calibration step 3



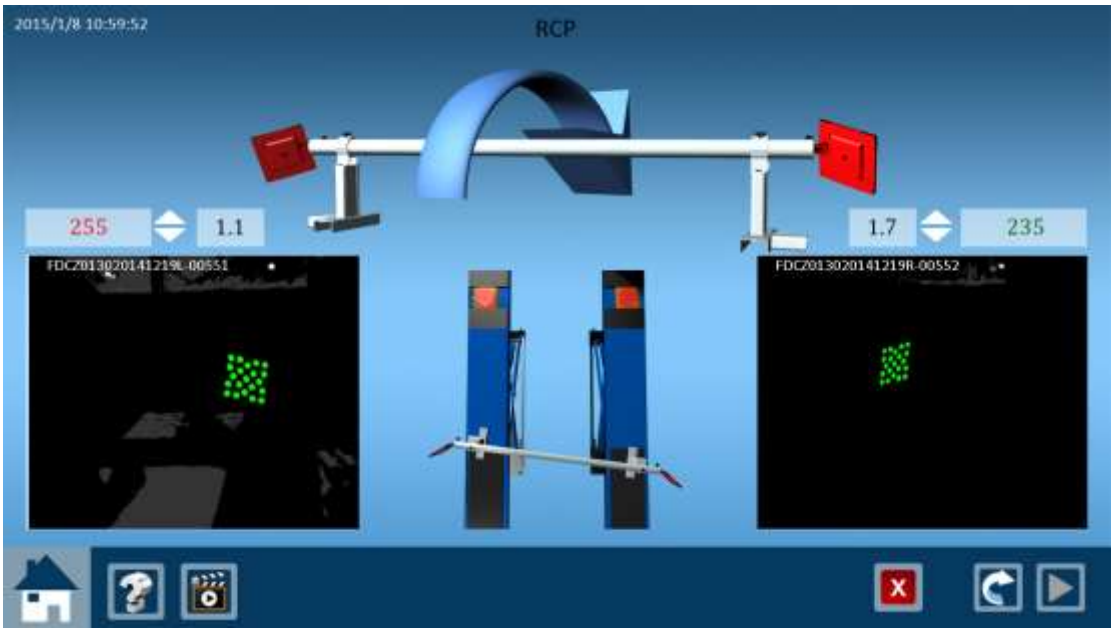
After calibration step 2 finished, move the calibration bar backward about 1m, so the distance from calibration bar to turntables is about 2m.



Operator need to move the right side of calibration bar forward about 300mm, left side keep the original position. Make sure the two targets on the calibration bar are vertical to the ground, and prepare to calibrate.



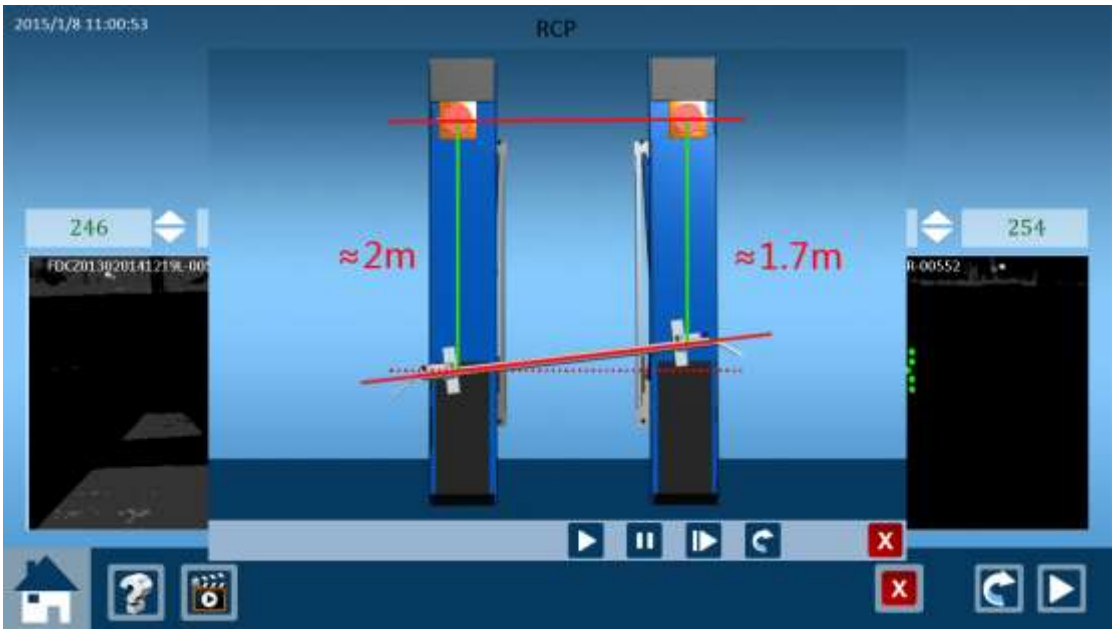
Click begin button, then turn the calibration beam slowly to the vehicle tail direction according to the animation indication.



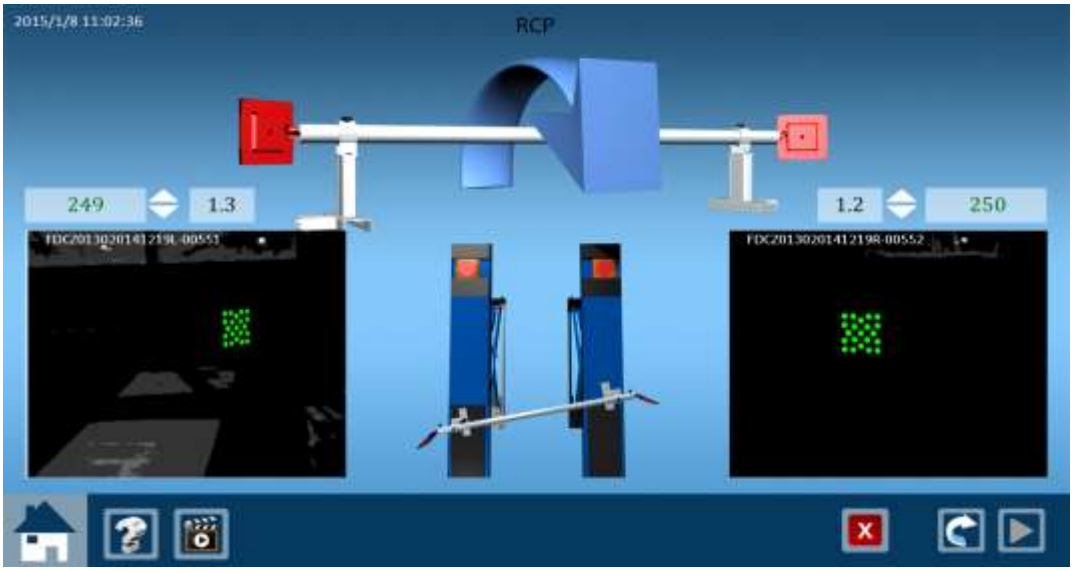
Turn the calibration beam slowly to the vehicle head direction when the arrow animation on the screen to vehicle head direction. When the screen appears STOP, the operator must stop turning the calibration beam.

Turn calibration beam to head direction till the screen appear STOP and stop turning. The screen will indicate “calculating staged calibration data, please prepare next calibration”, at this time, operator can move the calibration bar to prepare the next calibration step.

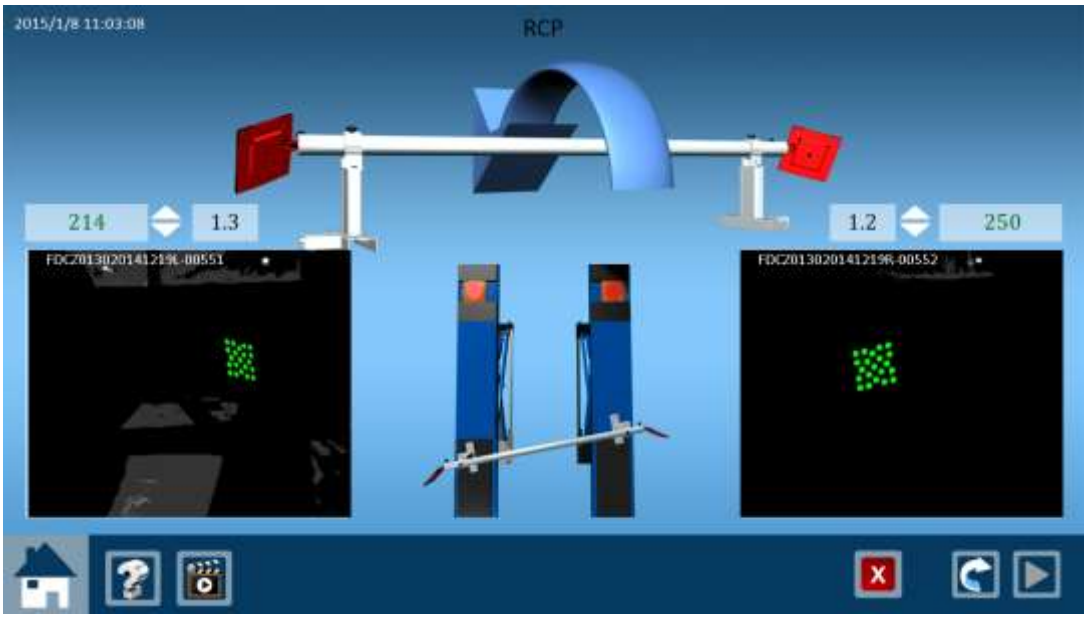
8.2.1.5 Calibration step 4



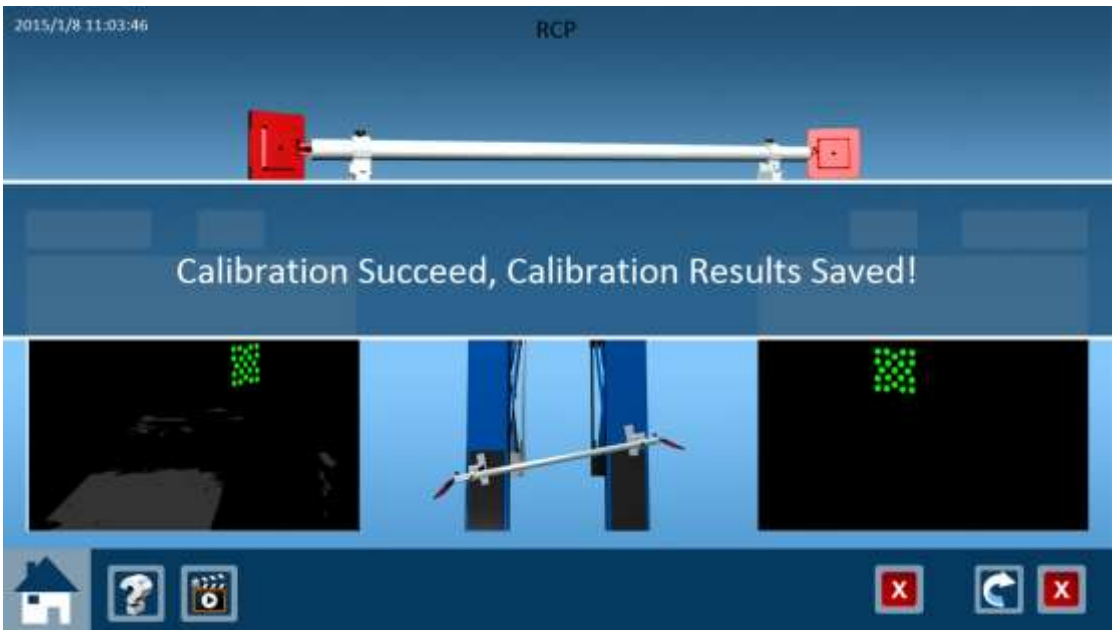
After calibration step 3 finished, operator need to move the right side of calibration bar backward about 300mm, back to original 1m position, and then move the left side of calibration bar forward about 300mm. Make sure the two targets on the calibration bar are vertical to the ground, and prepare to calibrate.



Turn the calibration beam slowly to the vehicle tail direction according to the animation indication.



Turn the calibration beam slowly to the vehicle head direction when the arrow animation on the screen to vehicle head direction. When the screen appears STOP, the operator must stop turning the calibration beam.



After calibration step 4 finished, the screen appears “calibration succeed, calibration results saved!”

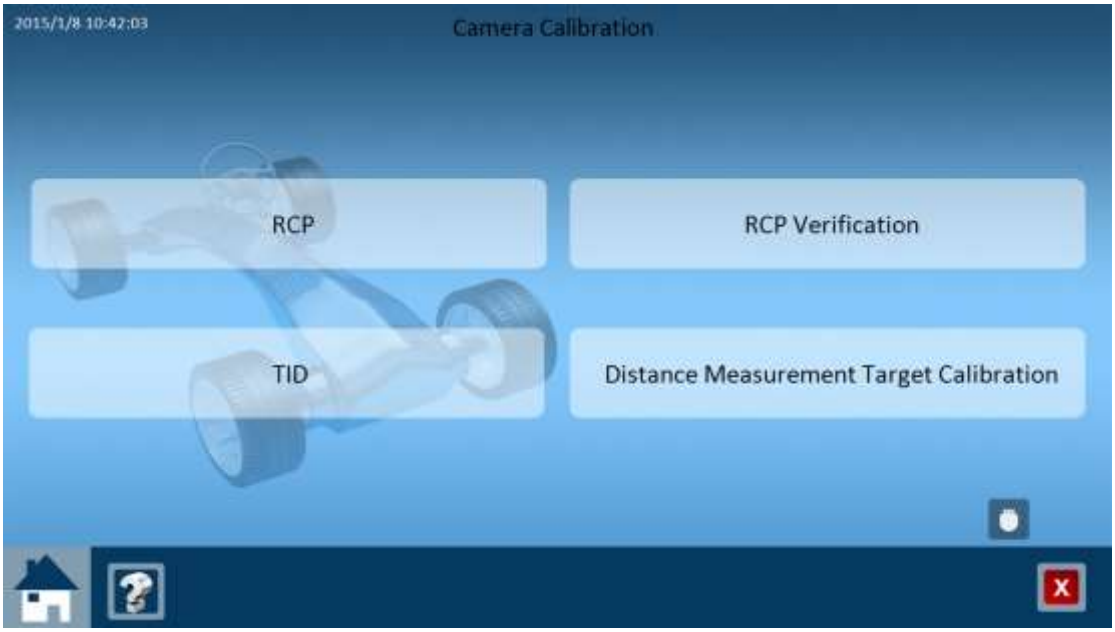
8.2.2 TID

Our 3D alignment products use the real-time TID calculation technology during the measurement, so the customer doesn't need to do TID after equipment installation. But it must make once TID if the customer wants to choose "super-measurement" way.

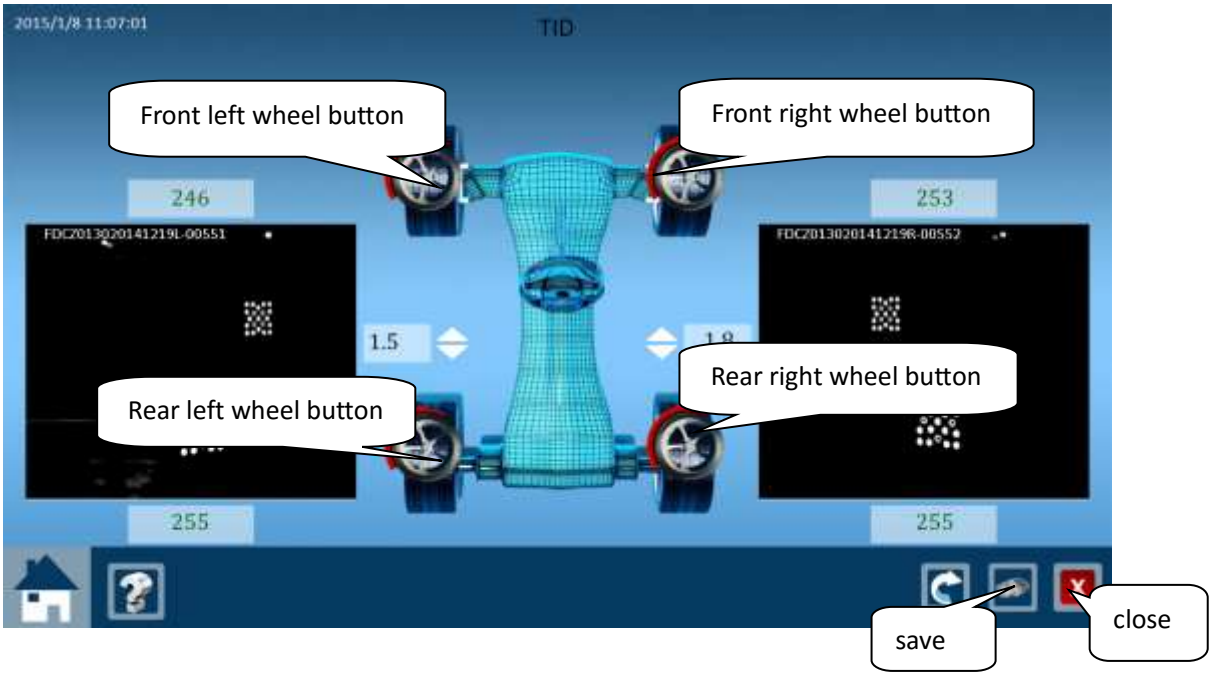
It needs to install the clamps with targets together after equipment installation, also use tool to fix the clamps and targets. Then clamp the four clamps with targets on the four wheels tightly, make sure the claws of the clamps stick to rim of the wheel very closely. Run wheel alignment software program, choose "TID" on camera calibration screen.

Note:

1. Make sure the claw of the clamp must stick to the rim of the wheel very closely and tightly. Because it is the important element to guarantee the precise measurement.
2. If the customer chooses "super-measurement" function, it must make once TID after equipment installation, make sure the clamps with targets always fix together after TID. It needs to make TID again if the clamps and targets separate, or will affect the measurement precision. Other measurement ways doesn't need to do TID, also clamps and targets can separate.

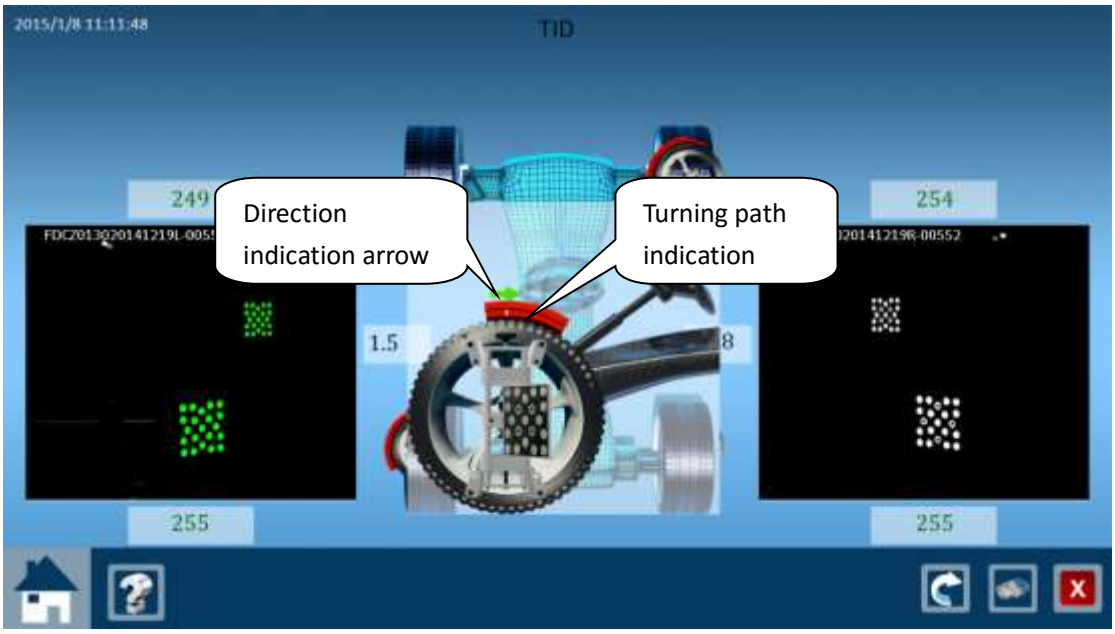


Click “TID” on the screen to enter TID.

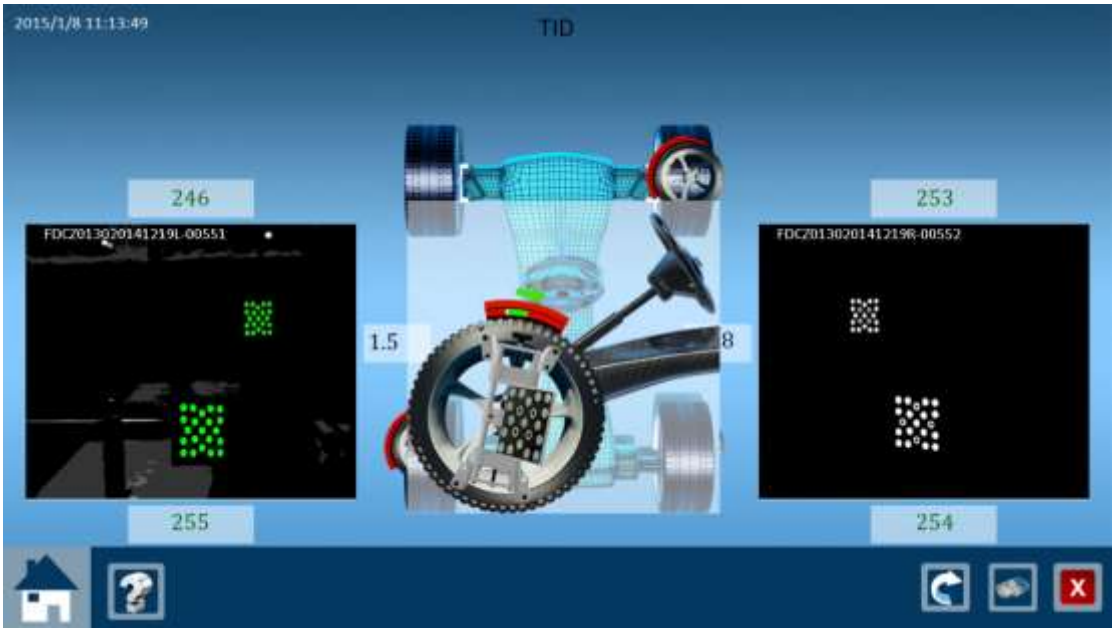


Enter TID screen, operator can click the any of the wheels to begin to do TID.

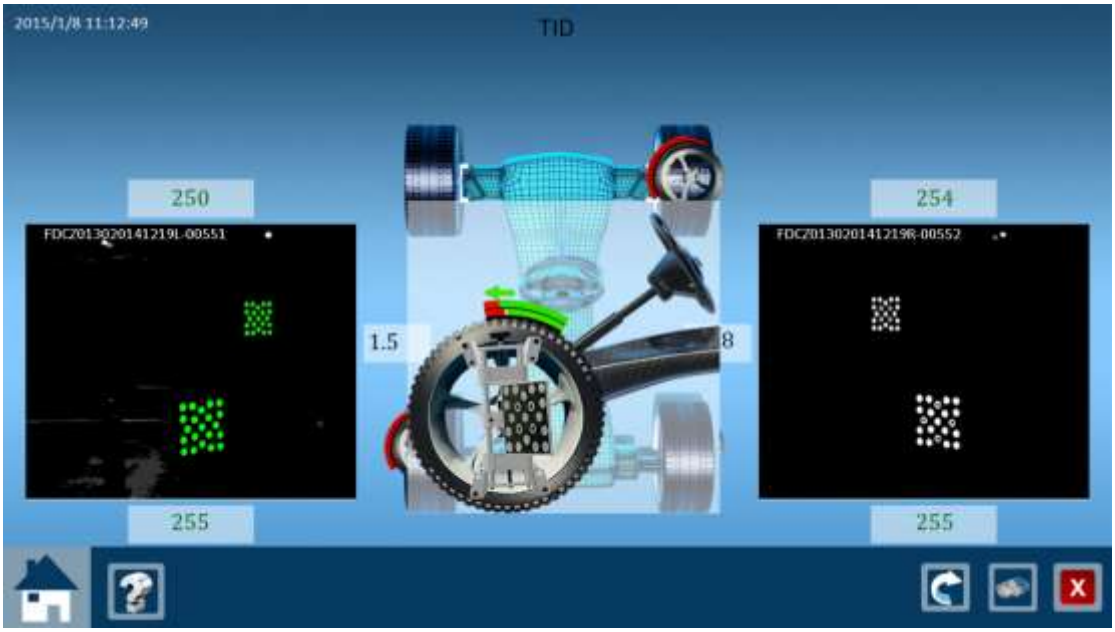
We choose front left wheel as example, click front left wheel button, the system will indicate “calculating camera exposure time, please don’t block targets”.



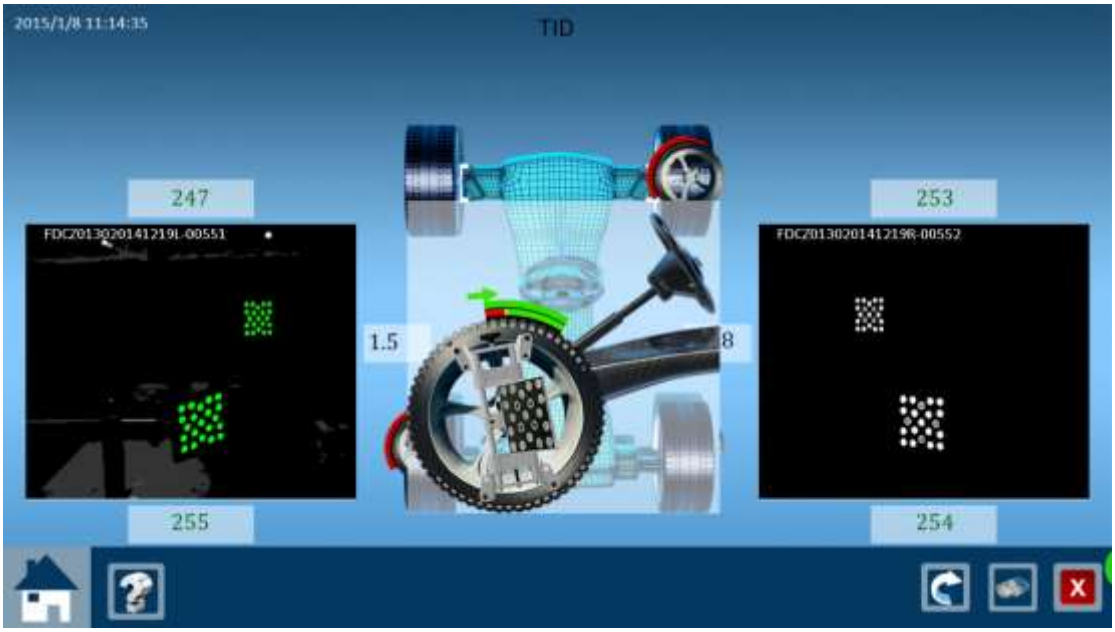
Operator must turn the wheel slowly to the vehicle tail direction according to arrow indication and turning path indication on the screen.



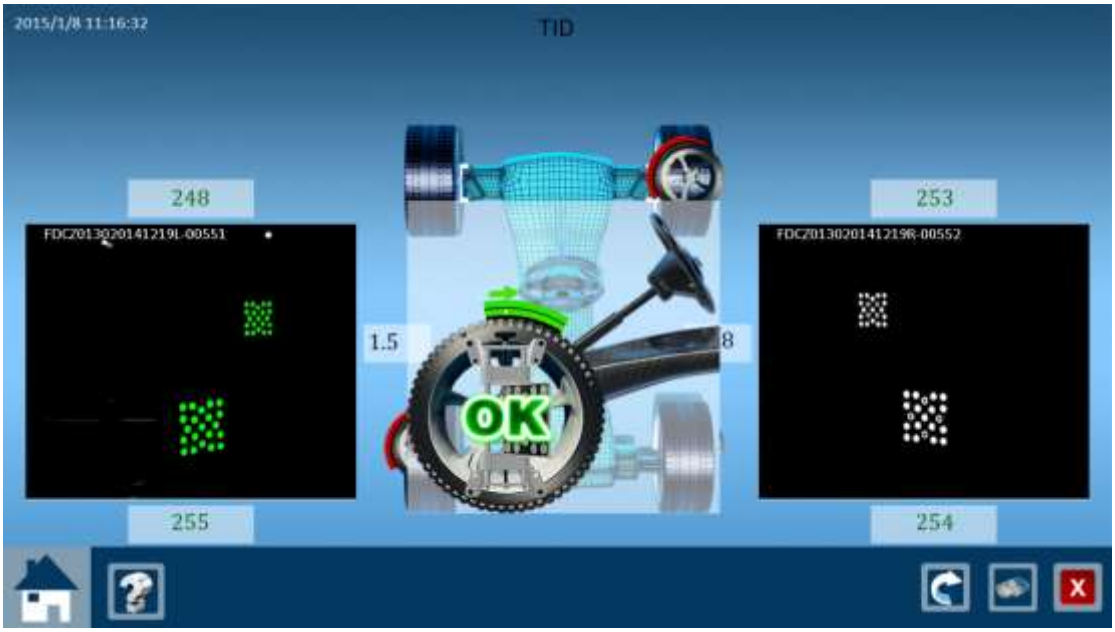
Wheel turning procedure.



When the screen appears STOP, stop turning and turn the wheel to the opposite direction according to the arrow indication.



When the screen appears STOP, stop turning and turn the wheel to the opposite direction again according to the arrow indication.

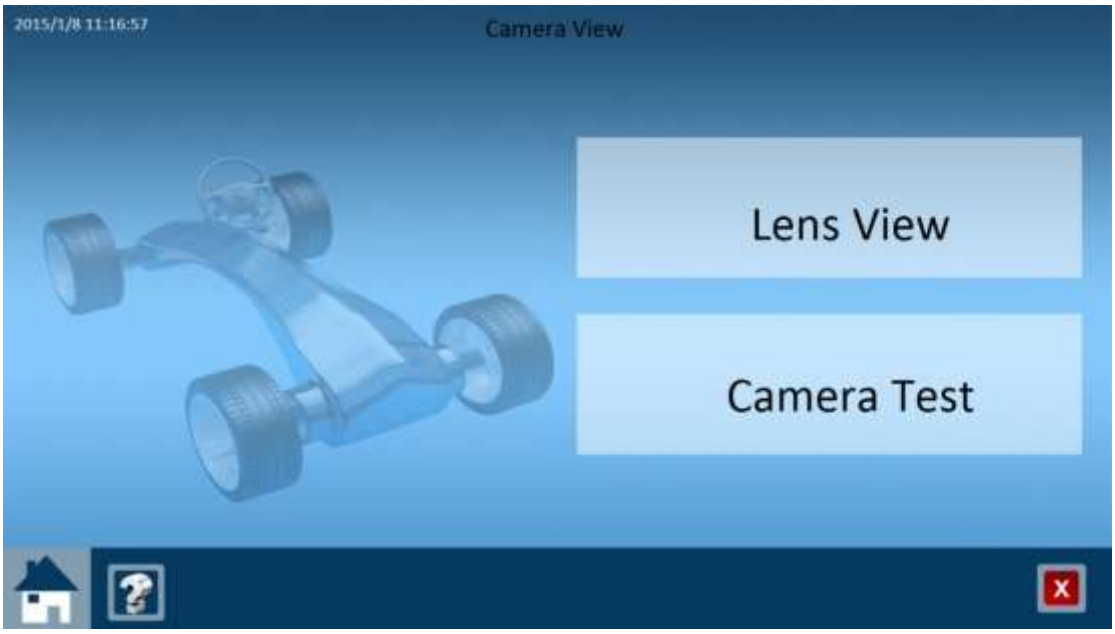


When turn to the original position , the screen appears OK, stop turning and finish the front left wheel TID.

The other three wheels TID procedure is the same as front right.

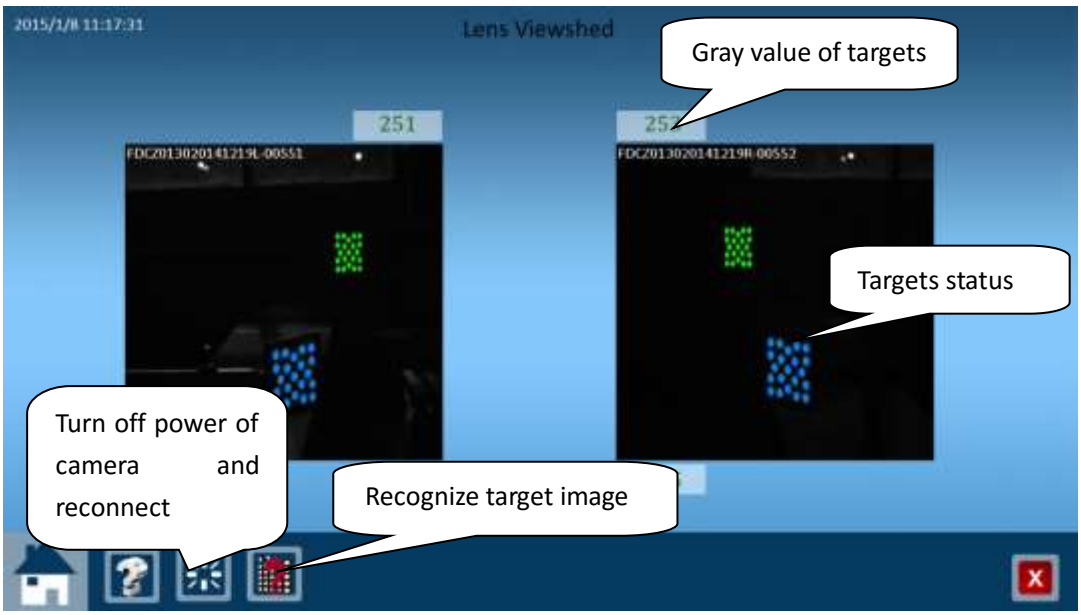
8.3 Camera View

Camera view include: lens view, and camera test.



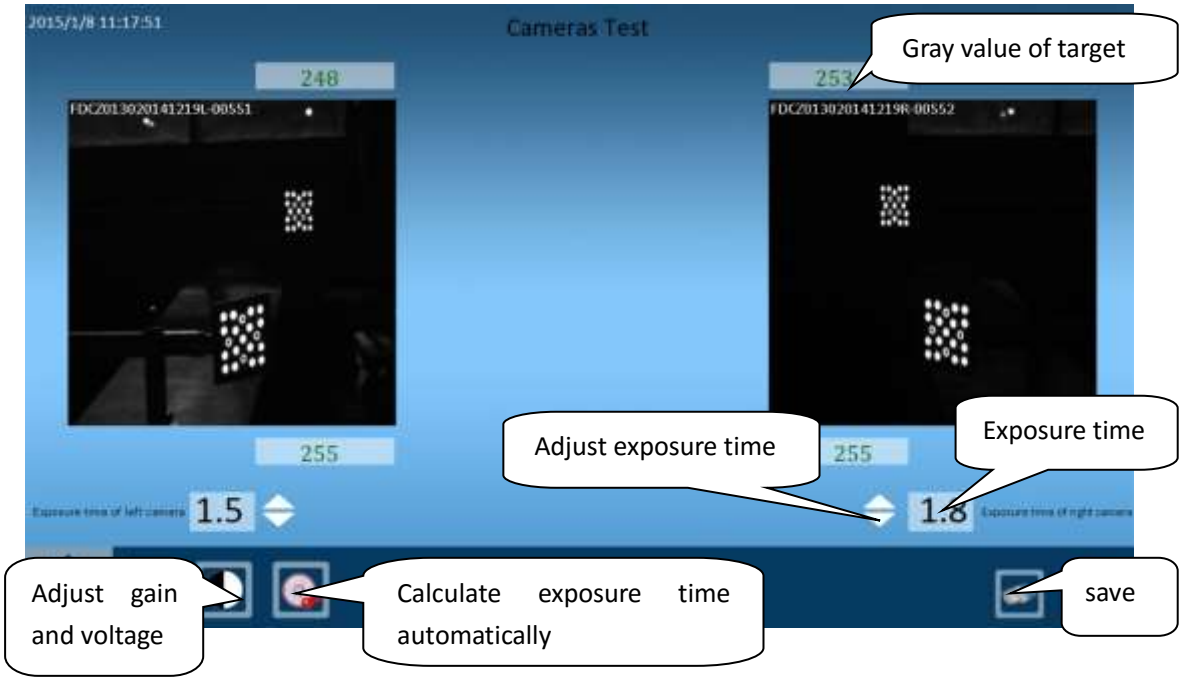
8.3.1 Lens view

Lens view screen display the original images of targets, operator can observe the targets color on targets display area, can test the left and right camera's lens view range.



8.3.2 Camera test

This function mainly to test and adjust the image effect, gray value range of front and rear targets, and also can adjust LED brightness.



Gain adjustment: adjust the light sensitivity of camera chip.

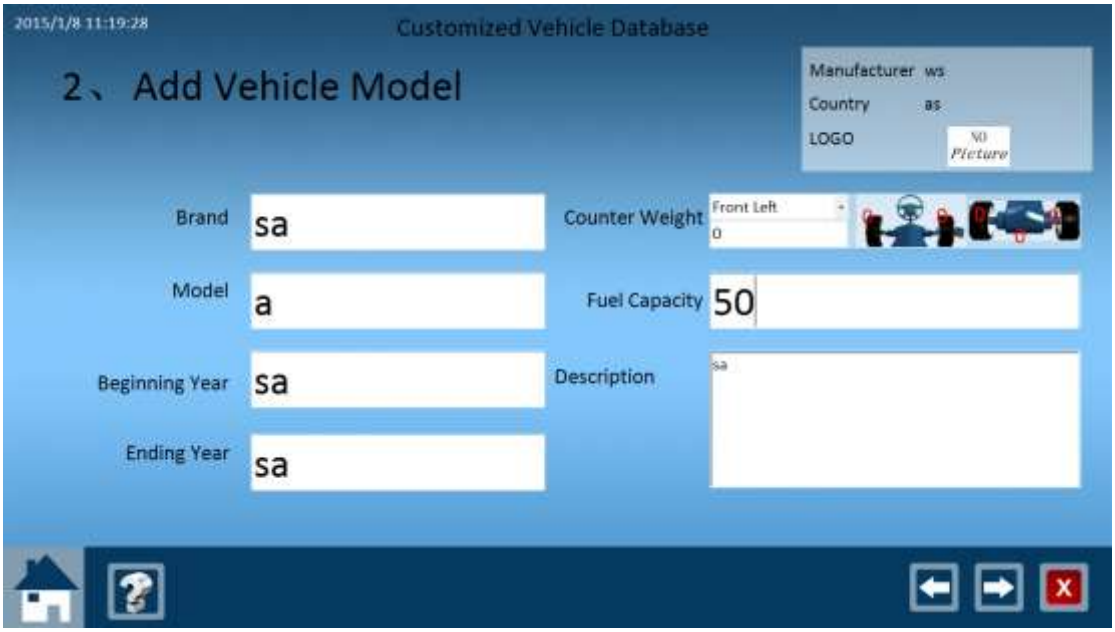
Exposure time adjustment: the measurement precision maybe affected if the working environment lighting is too bright or too dark due to the dots of targets brightness will change. Operator can adjust targets image brightness by adjusting exposure time. Also can click “calculate exposure time automatically” to adjust automatically.

Gray value: represent the brightness of targets. System requires the brightness range is 210-255.

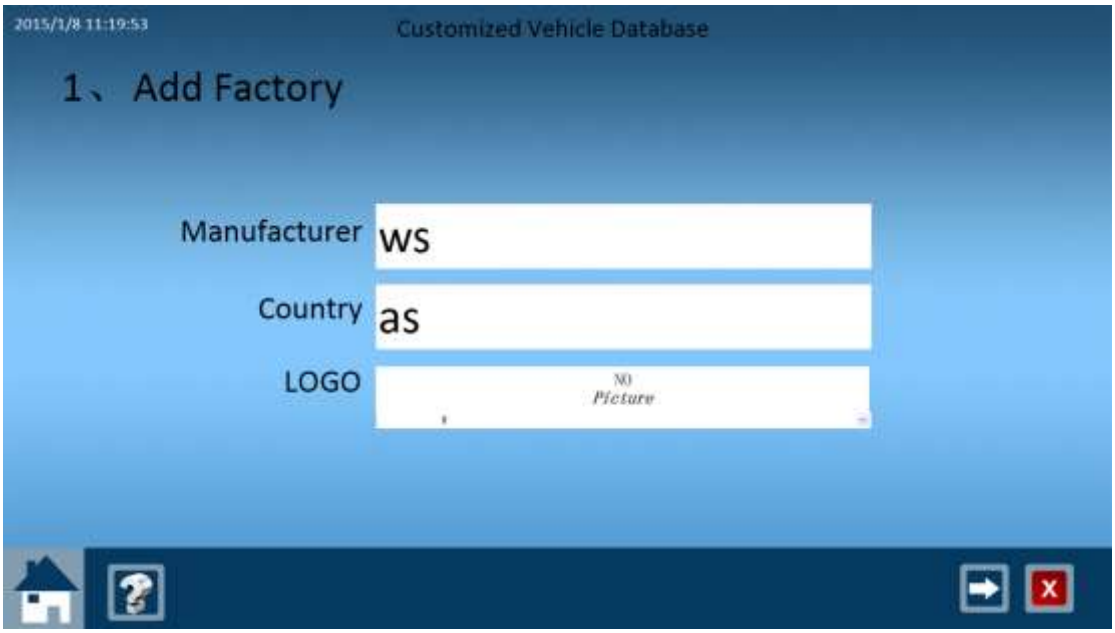
Led board voltage: operator can adjust LED brightness by adjusting the voltage of LED.

8.4 Add vehicle specification

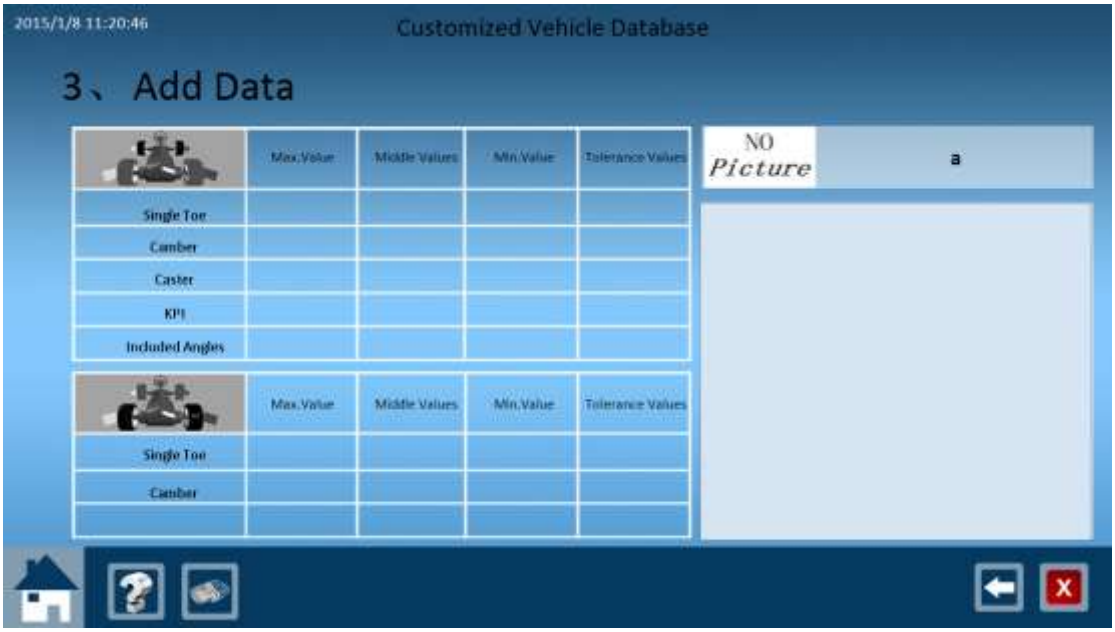
Customer can input the vehicle specification that software database doesn't have. Click "add vehicle to database" on system maintenance screen to enter the operation screen.



First, input all the necessary information in the blank, and click next step.



Second, input the required information in the blank, and click next step.



Third, input the vehicle specification. The unit of Toe can be degree, mm or inch. The other angles specification default unit is degree. Please input value as 0 if there isn't specification. Click add data after input will save the adding specification.