

THINKCAR



THINKCAR Wheel Aligner TWA 825M

Installation Operation Service Manual

Matters needing attention:

- Please read this manual carefully before use and keep it for future reference.
- The equipment list should be checked carefully before use. If in doubt, contact Thinkcar Tech Inc immediately.
- Due to the continuous upgrading of the product, the manual and the physical have a slight difference, without notice, please prevail in kind.

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This equipment is intended for use by specialized technicians or maintenance personnel.

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1 Product Introduction

1.1 Model Introduction

TWA 825M: Portable Vehicle Four-Wheel Alignment System.

1.2 Product Specifications

Dimensions: Length 2720 * Width 840 * Height 2400 mm;

Weight: 141 KG;

Operating Temperature: 0 to 60°C;

Storage Temperature: -20 to 70°C;

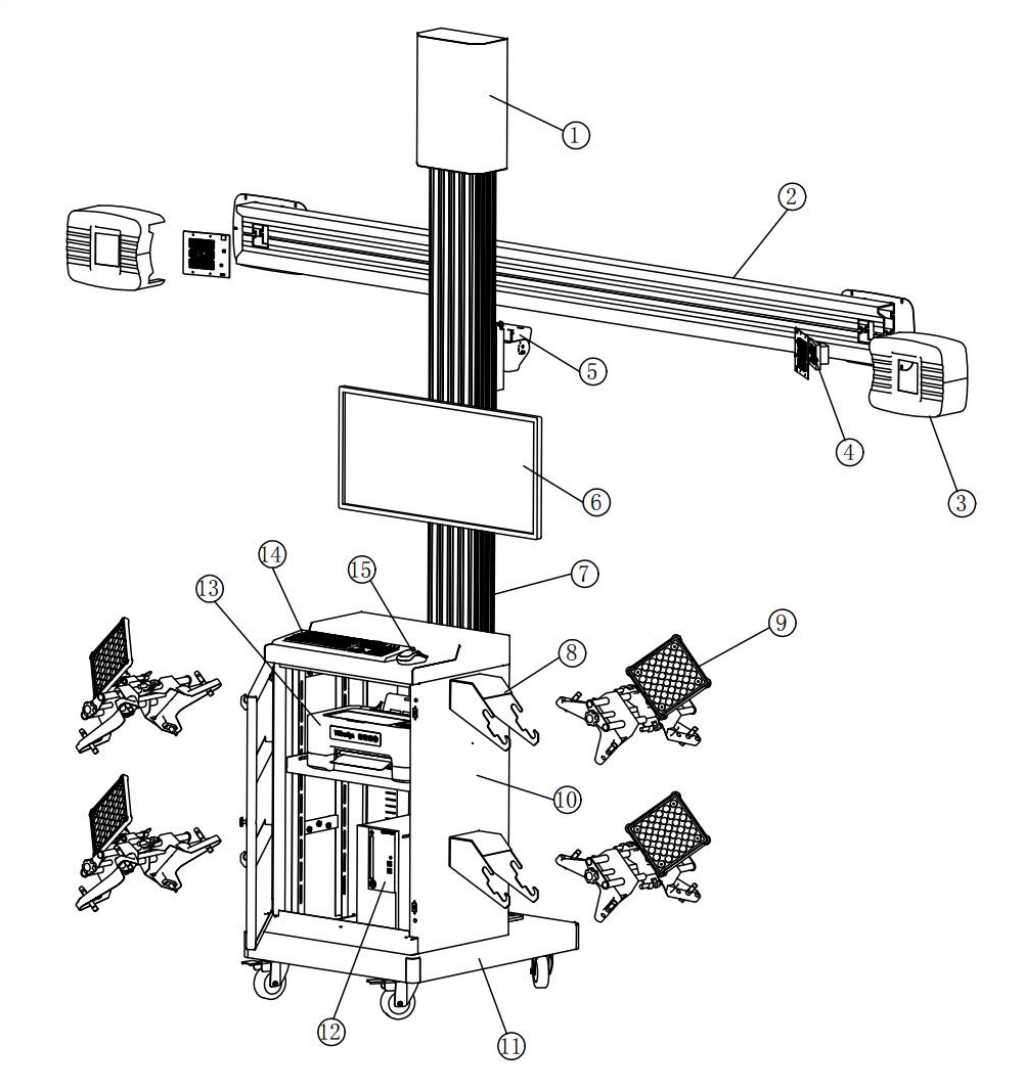
Storage Humidity: 10% to 90%, no condensation;

Computer Specifications: Subject to actual provision.

1.3 Technical Specifications

Measurement Item	Front Wheel Measurement Accuracy	Front Wheel Measurement Range	Rear Wheel Measurement Accuracy	Rear Wheel Measurement Range
Camber	±0.02	±20°	±0.02	±20°
Toe	±0.02	±15°	±0.02	±15°
Kingpin Inclination (KPI)	±0.02	±26°	N/A	N/A
Kingpin Offset (KRO)	±0.02	±26°	N/A	N/A
Steering Angle	N/A	N/A	±0.02	±5°

1.4 Product Explosion Diagram

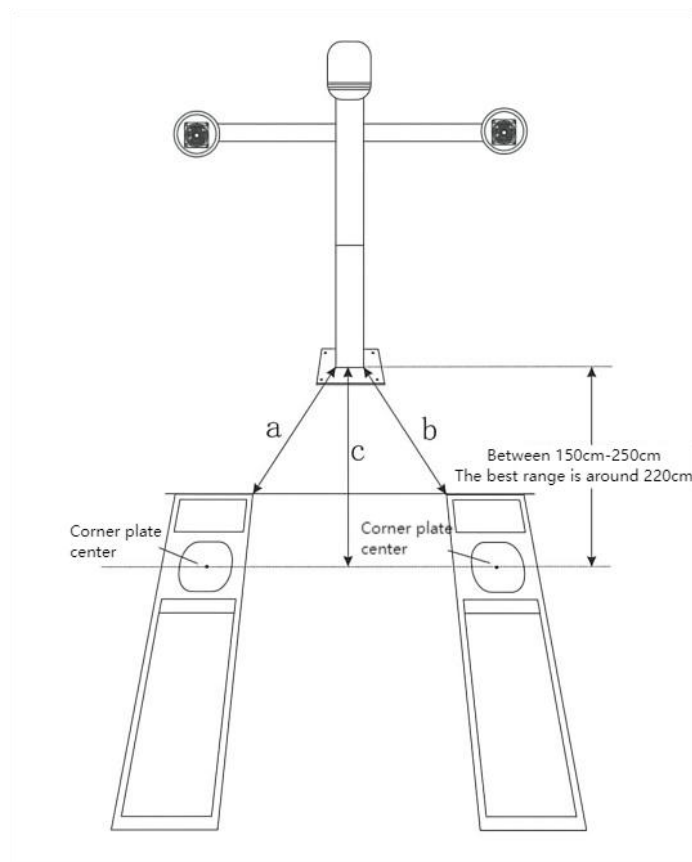


TWA 825M Exploded Parts			
1	Top hat	9	Target
2	Crossbeam	10	Cabinet
3	Lamp cover	11	Mobile base
4	Camera module set	12	Host
5	Crossbeam lifting arm	13	Printer (optional)
6	Display	14	Keyboard
7	Column	15	Mouse
8	Target stand		

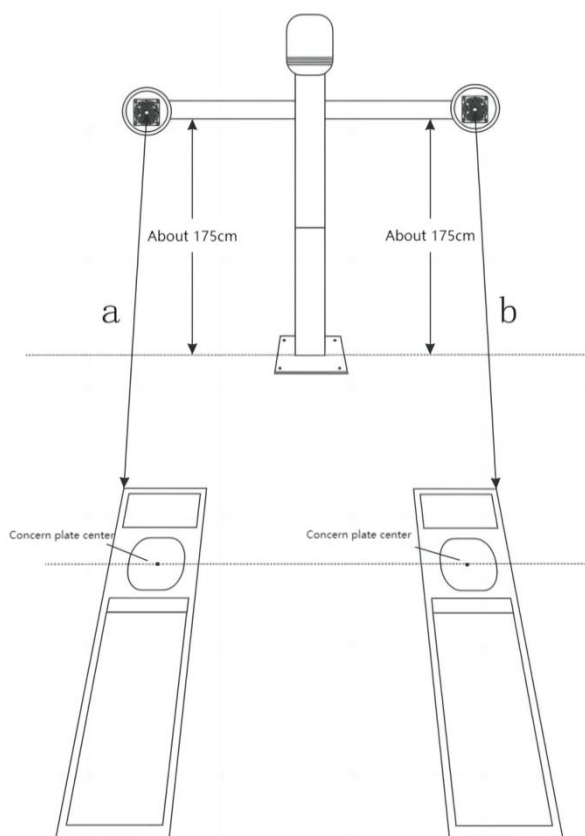
2 Wheel Alignment Installation Step

2.1 Installation Location

Place the camera column in front of the lift. The straight-line distance c from the front end of the camera column to the center line of the two corner plates is 150cm to 250cm, and the optimal distance is about 220cm. The distance from both sides of the column to the inner side of the front end of the lift platform is equal ($a=b$).



Ensure that the distances from both ends of the camera beam to the horizontal ground are equal, and the distances from the two cameras to the outside of the front end of the lift platform are equal ($a=b$). Slight errors are acceptable and will have little impact.



2.2 Installation Steps

1. Unpack and inspect the equipment.

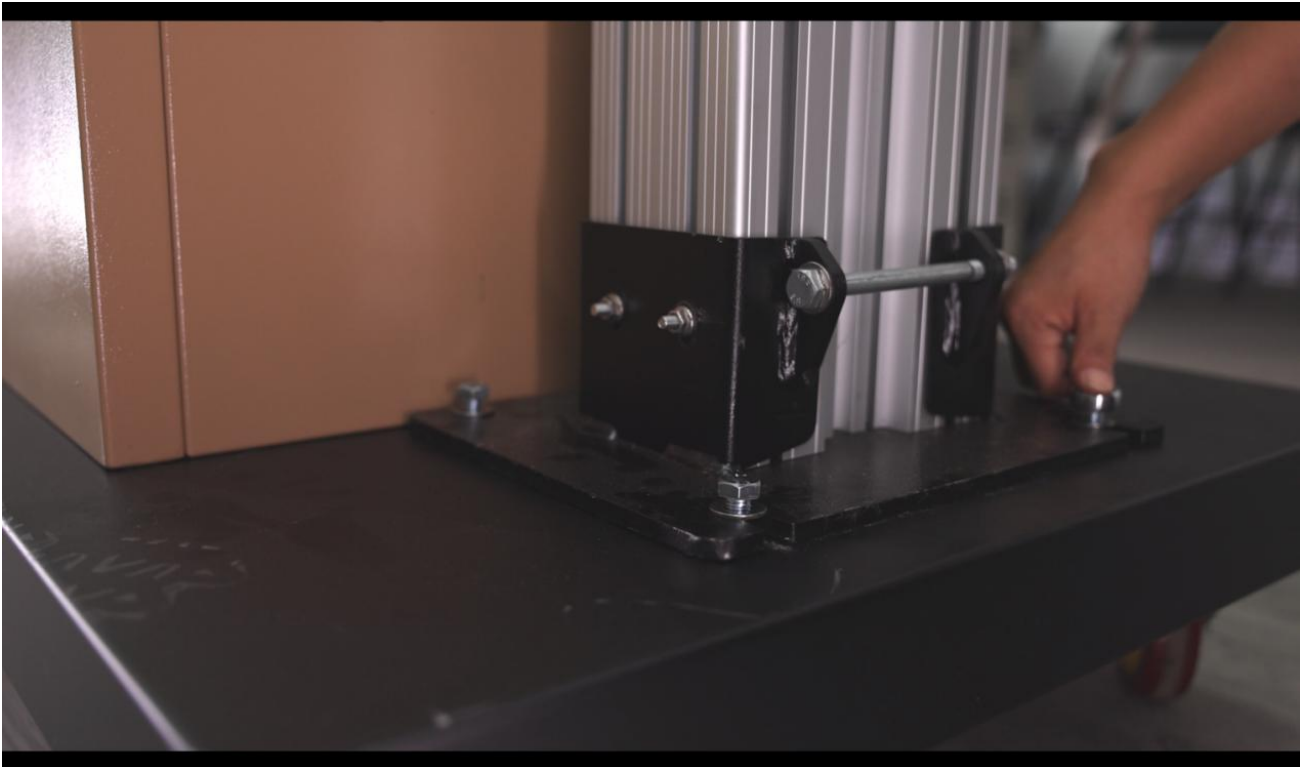
- (1) Please refer to the [**Appendix A Packing List**] section to check whether the equipment items and accessories are complete, whether the accessories are intact, and whether there is any damage.

2. Install the logo cap on the top of the column.

- (1) Install the logo cap with the word [**THINKCAR**] printed on the top of the equipment column.

3. Install the equipment column.

- (1) Place the column vertically at the installation position on the rear side of the equipment cabinet, and use the [column fixing screw] to connect the bottom of the column to the cabinet floor. There is no need to lock it at this time to facilitate the next step of installation.



4. Install the cabinet ears and connect the columns to the cabinet.

- (1) Take out the [cabinet ears] and use [No. 6 screws (M6*16MM)] to fix them to the screw holes at the back of the cabinet.



- (2) Adjust the screw position at the bottom of the column so that the remaining screw holes

of the cabinet ears can match the grooves of the column.

(3) Use [No. 6 T-type screws (with caps)] to connect and fix the [cabinet ears] to the column.



(4) Repeat the above steps again and tighten the screws at the bottom of the column.

5. Install the cabinet clamp bracket.

(1) Take out the [cabinet clamp screw] and screw it into the screw hole on the side of the cabinet. It is not necessary to tighten the screw completely at this time.



(2) Hang the [Clamp Iron Frame] as shown in the figure below and tighten the screws.



(3) Repeat the above steps to complete the installation of four [clamp iron frames] on both sides of the cabinet.

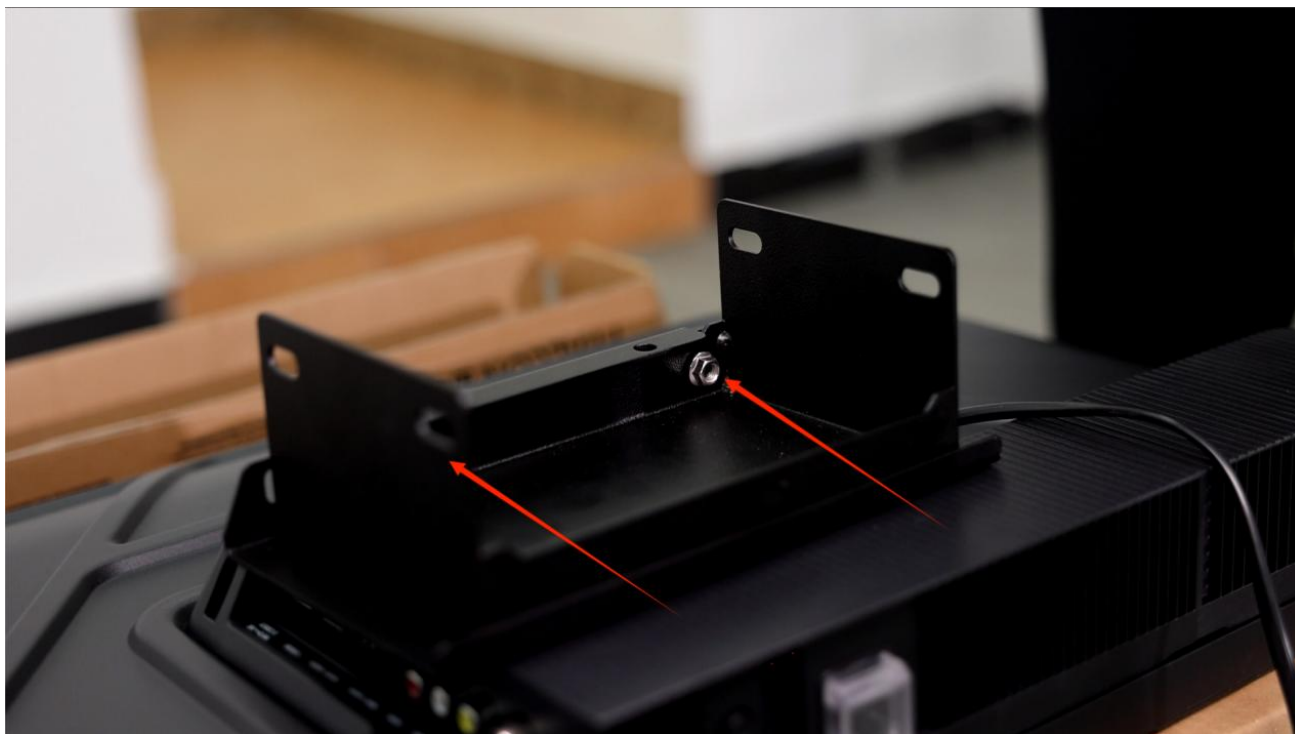
6. Install the camera beam.

- (1) Place the camera beam on the bracket plane and use the No. 6 T-type screws (with caps) to fix the camera beam to the beam bracket platform.
- (2) Pass the wire harness on the camera beam into the cabinet through the interface on the back of the cabinet and arrange it slightly for subsequent wiring.

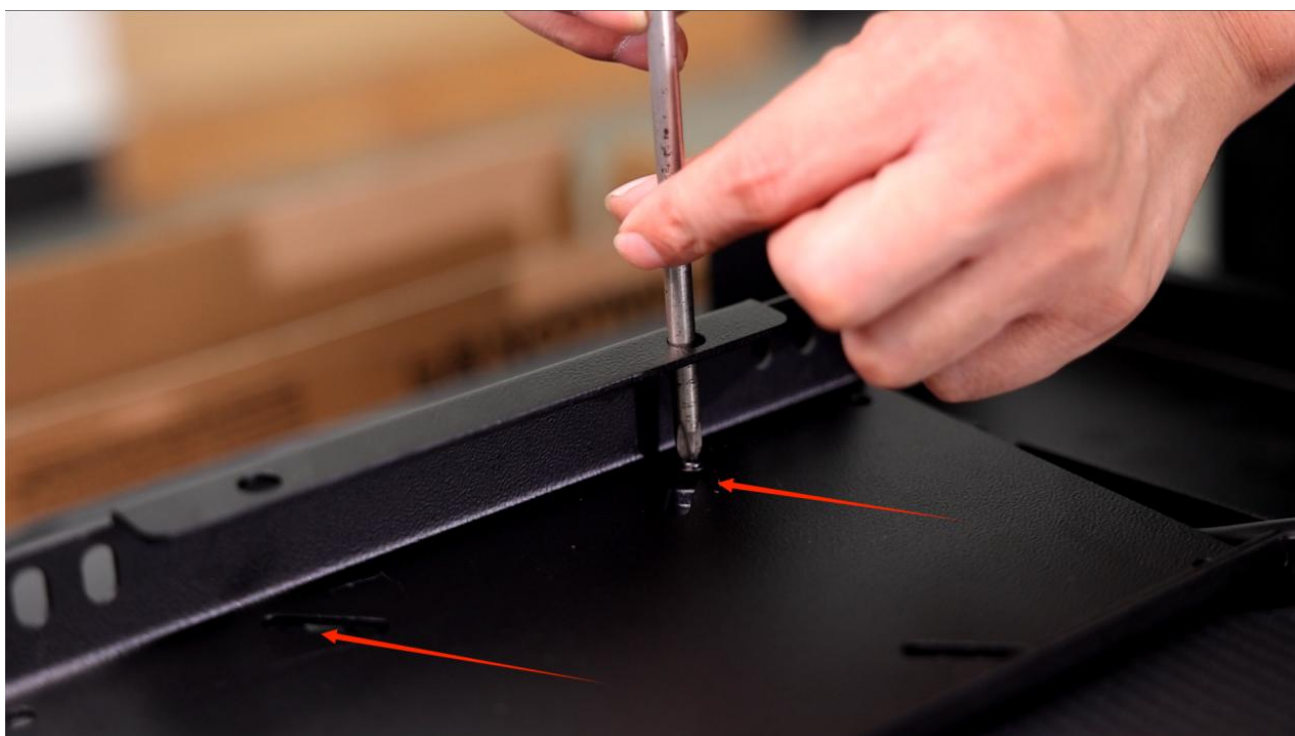


7. Install the 32-inch monitor.

- (1) Take out the [32-inch monitor] and [monitor stand], and remove the two screws on the back of the monitor.
- (2) Remove the screws on the front of the [monitor stand], set aside for later use, and separate the monitor stand.



- (3) Use No. 4 screws to install the monitor stand into the screw holes on the back of the monitor.



- (4) In the opposite way to separating the monitor stand in step 2, use the screws just removed from the front end of the stand to assemble the monitor stand together.



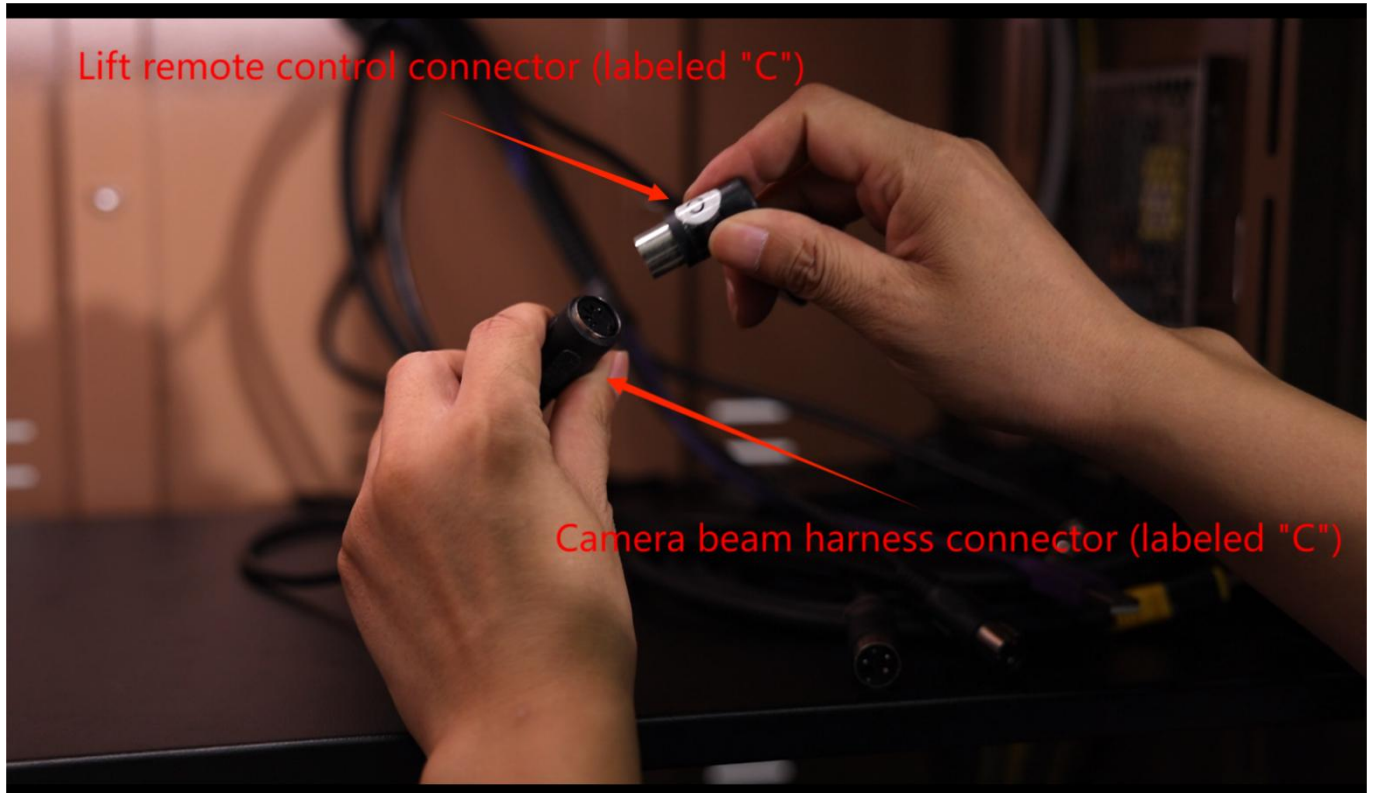
- (5) Carefully lift the monitor and use the No. 6 T-type screws to secure the monitor to a suitable height in front of the column.



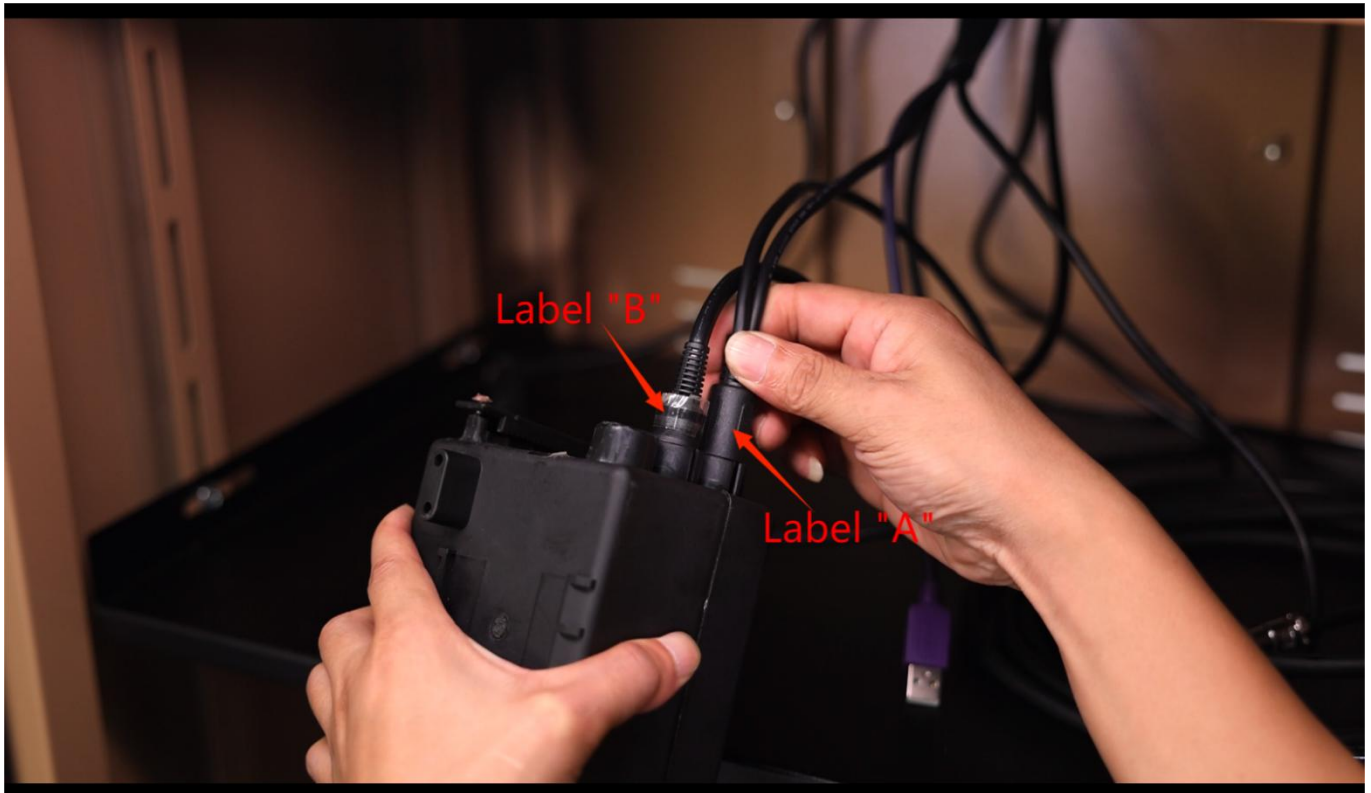
- (6) Connect the monitor power cable and the monitor high-definition cable, and pass the wire harness into the cabinet through the interface on the back of the cabinet. Arrange it slightly for subsequent wiring.

8. Install the computer host and wire harness connection.

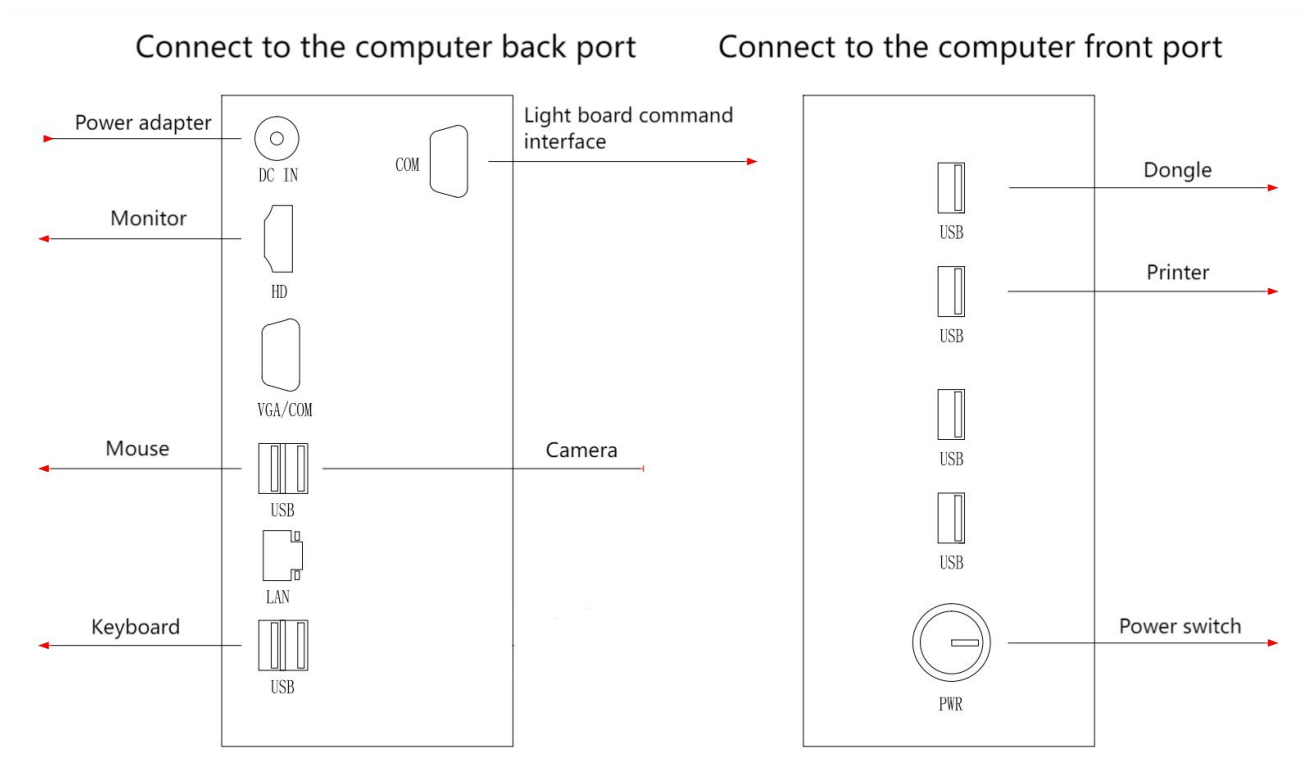
- (1) Take out the [lifting controller (including remote control)] and connect the remote control connector (with label "C") with the camera beam connector wire harness connector (with label "C") together.



- (2) Connect the camera beam harness with labels "A" and "B" to the [elevator controller], making sure they match the labels on the controller.



- (3) Take out the [computer host], connect the computer adapter to the computer, install the WIFI antenna on the back of the computer host, and insert the dongle (purple USB flash drive) attached to the host into the USB port on the front of the computer.



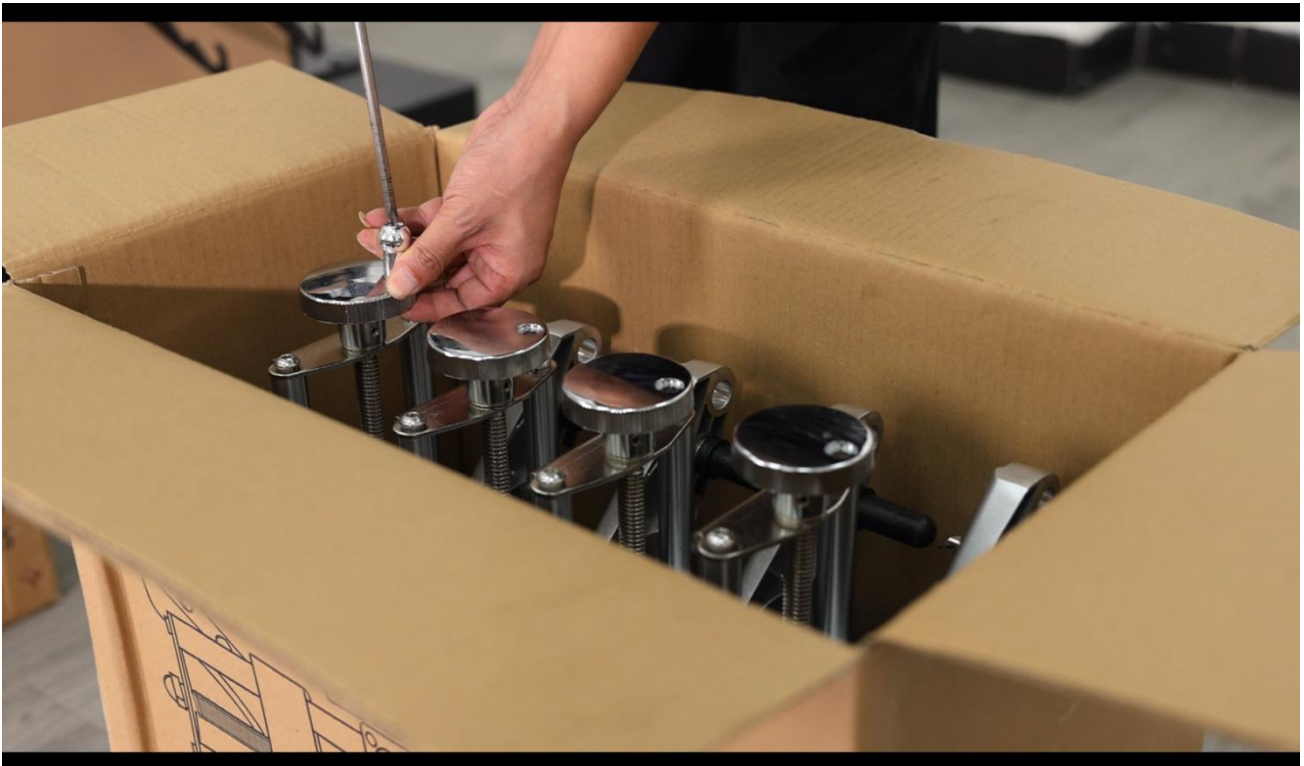
- (4) Place the computer host in the upper layer of the equipment cabinet and start connecting

the wiring harness.

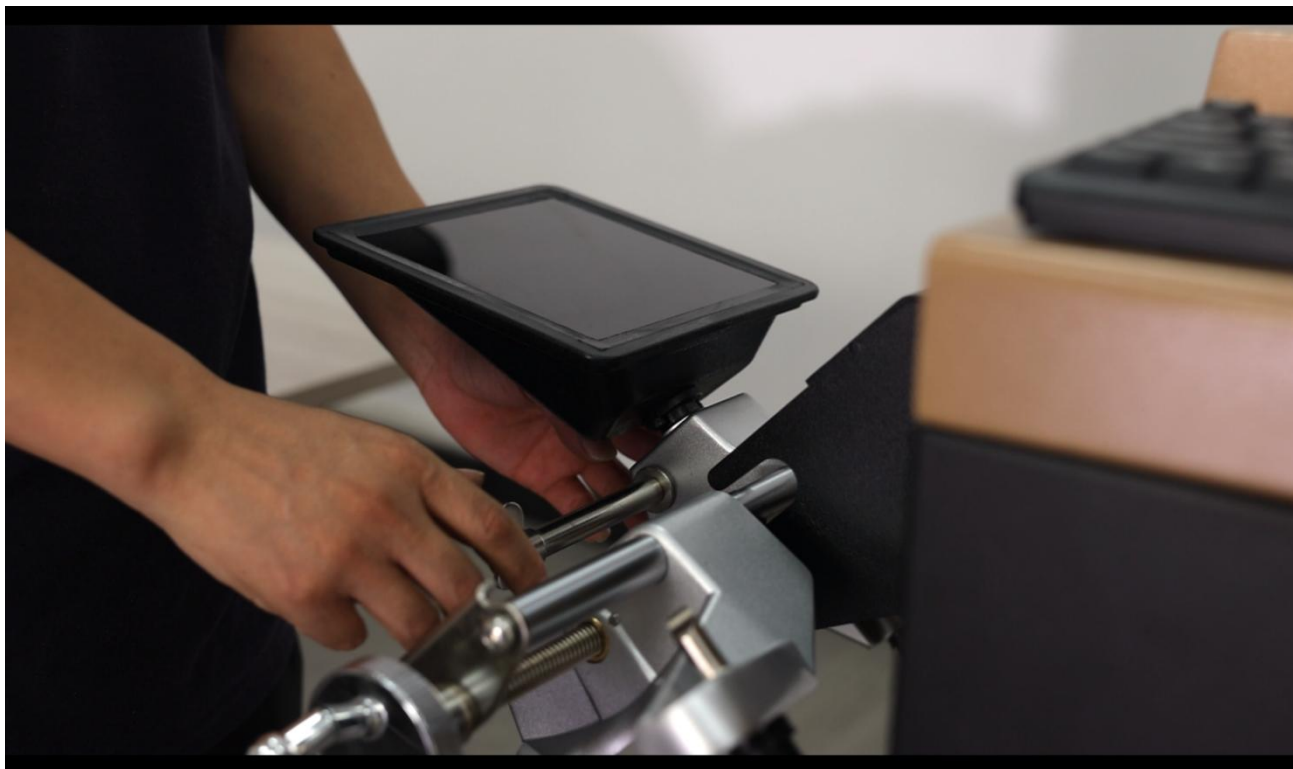
- (5) As shown in the figure below, connect the equipment harness to the corresponding interface of the computer according to the wiring requirements in the figure below.
- (6) Connect the metal power port of the camera to the power port on the side of the cabinet.
- (7) Arrange the wiring harness inside the equipment cabinet.

9. Target fixture installation

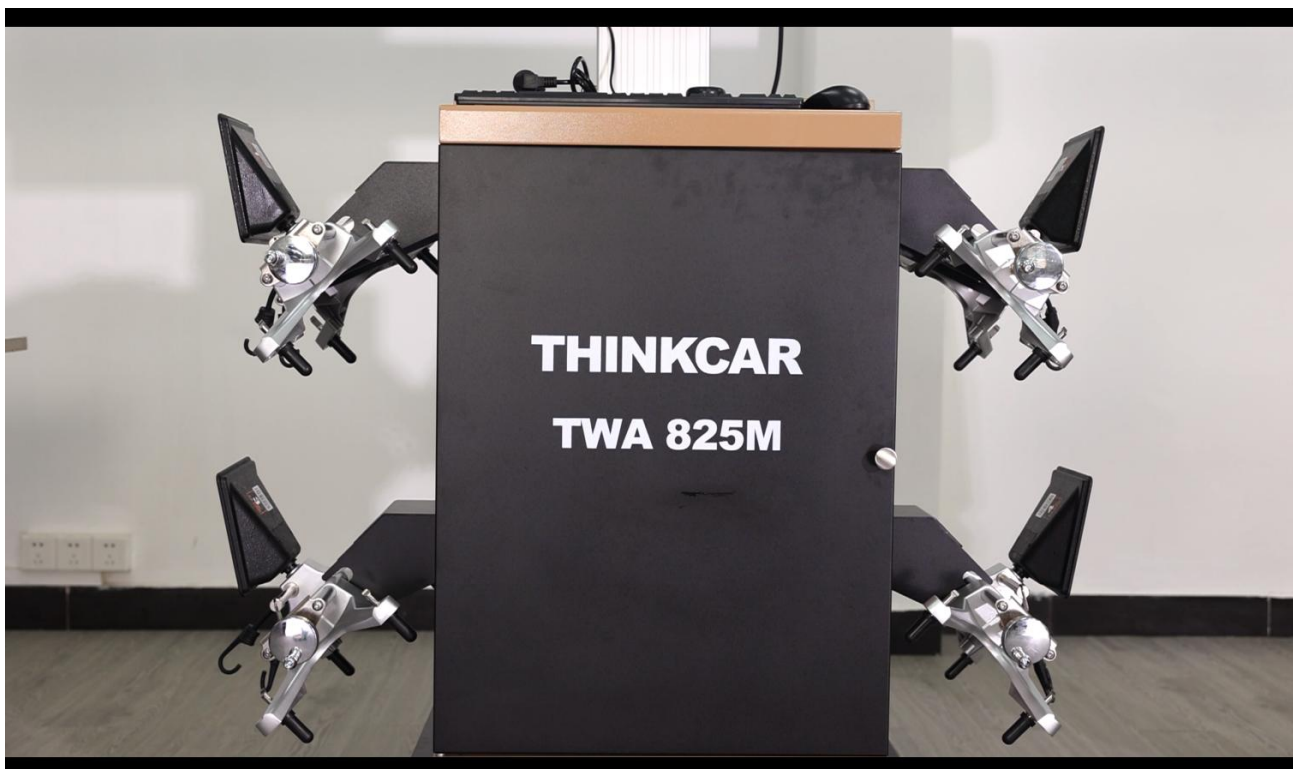
- (1) Use a screwdriver to install the adjustment handle on the [fixture].



- (2) Install the target on the fixture hole by rotating the handle on the side of the fixture.



(3) Install the four target fixtures on the side brackets of the cabinet in sequence.



10. Take out the power cord of the device and connect it to the socket, and complete the grounding measures according to the actual situation.

3 Four-wheel alignment operation steps

3.1 Standard Operating Procedures of 3D Four Wheel Alignment

The first step: inquiring and testing.

Listen carefully and record the driver's description of the abnormal symptoms of the vehicle. Some abnormal symptoms caused by the four wheel positioning angle can be found through visual inspection, the most obvious symptom is its tires with irregular wear. Listen to the driver's description is very important because some problems can't be found through naked eyes. Drive the car to conduct a test to further confirm the possible fault area. The second step: car chassis and tire inspection and maintenance.

The second step is to carry out a systematic inspection of the components and the vehicle chassis after the inquiring and testing.

Because four wheel positioning alone can't solve all problems if the vehicle parts or tires or others exist problems. Before doing the four wheel position, we should check the tire pressure, tire wear degree, and whether the chassis part is loose or not, and whether there is a gap between the swing arm to the ball joints and plastic parts and so on.

The third step: car wheel deviate.

If the vehicle's wheel is deviated, we should confirm whether this is caused by the vehicle pulls sideways before doing four wheel alignment. The following is the method to do it. (the various parts of the chassis are well preserved):

- 1.If it is a vacuum tire (radial tire), exchange the front two wheels, and then test the car, if the deviation phenomenon does not exist or deviate to the opposite direction, we can be sure that the deviation is caused by the tires or its steer rim. One of the main reasons for car deviation is its tires. The following are some solutions to solve them.
 - (1)Exchange the four wheels until find out a combination to offset the deviation.
 - (2)Remove the two front wheel and install it with the opposite side.
 - (3)Exchange the tires or install it on the opposite side of the tire can significantly reduce or solve the deviation problem. If the effect is not obvious or the tires is slightly deformed you can also consider to replace new tires.

2.If the deviation direction is still the same after exchanging the tires, you can repeat the above operation on the rear axle; If it is still running in the same direction, you can eliminate the possibility that the deviation is caused by wheel pull sideways. You can only find out the deviation cause by doing four wheel alignment.

The forth step: Perform the four-wheel alignment process and analyze the test results.

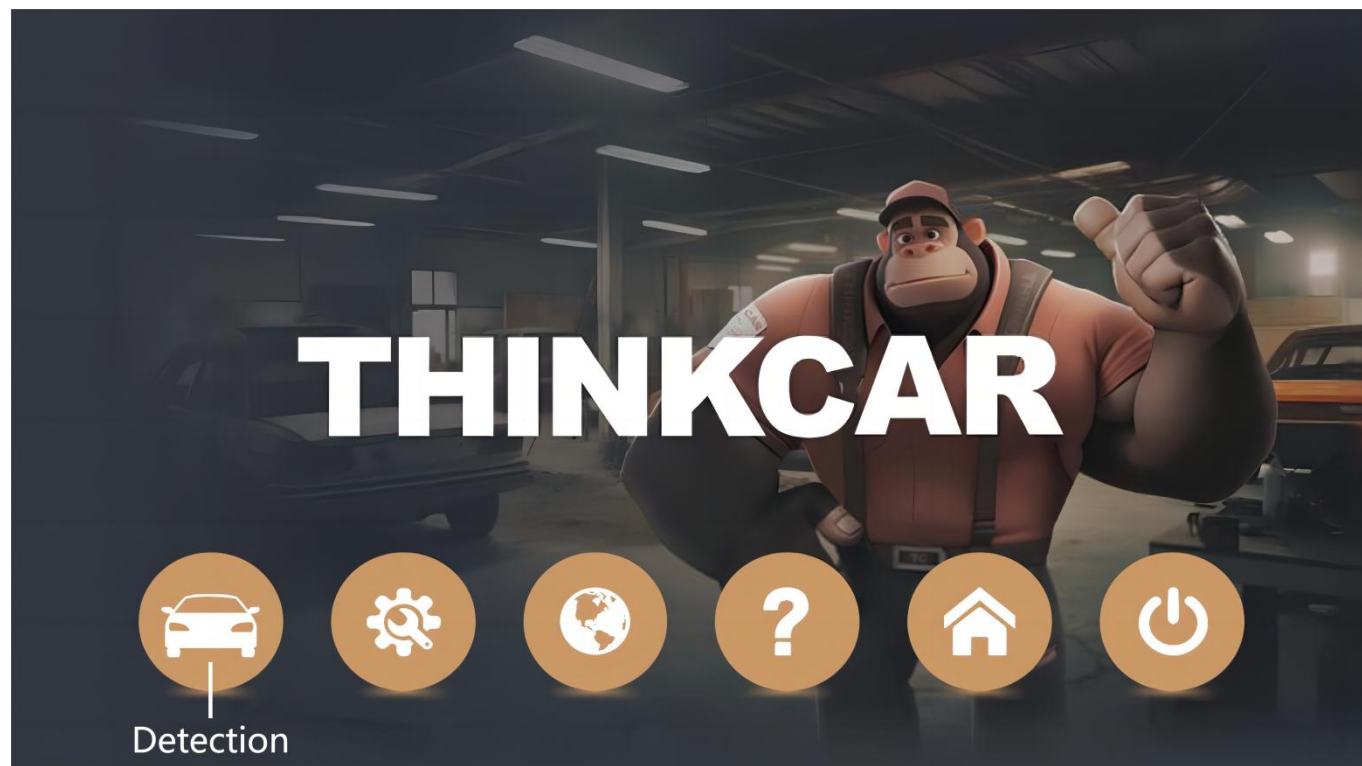
- 1.Standard operation process of four wheel alignment (section 2 of the 2 chapter).
- 2.Data analysis and adjustment 3. Save and record data, and then test the car after wheel alignment.

Note: Please check the detail information in the following chapter to know more about standard operation process of four wheel alignment and data analysis and adjustment.

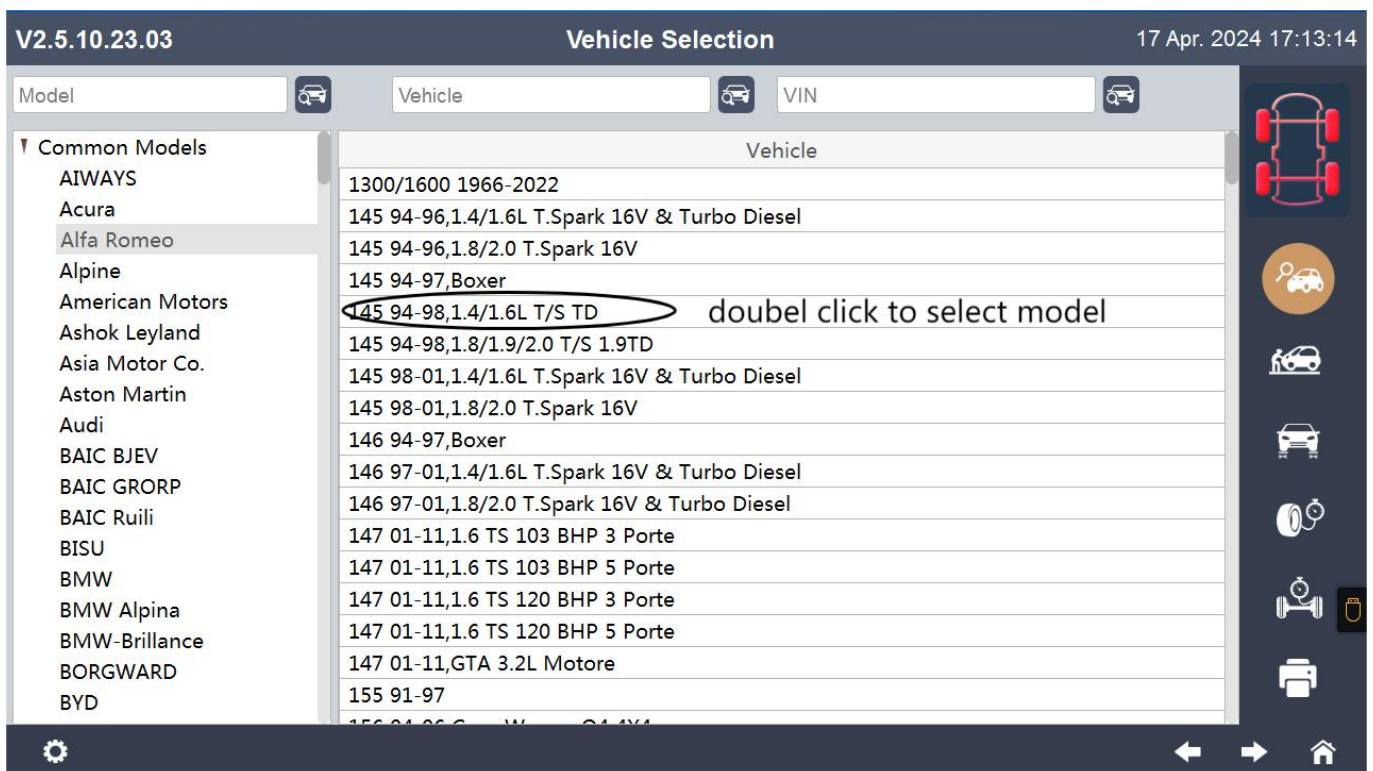
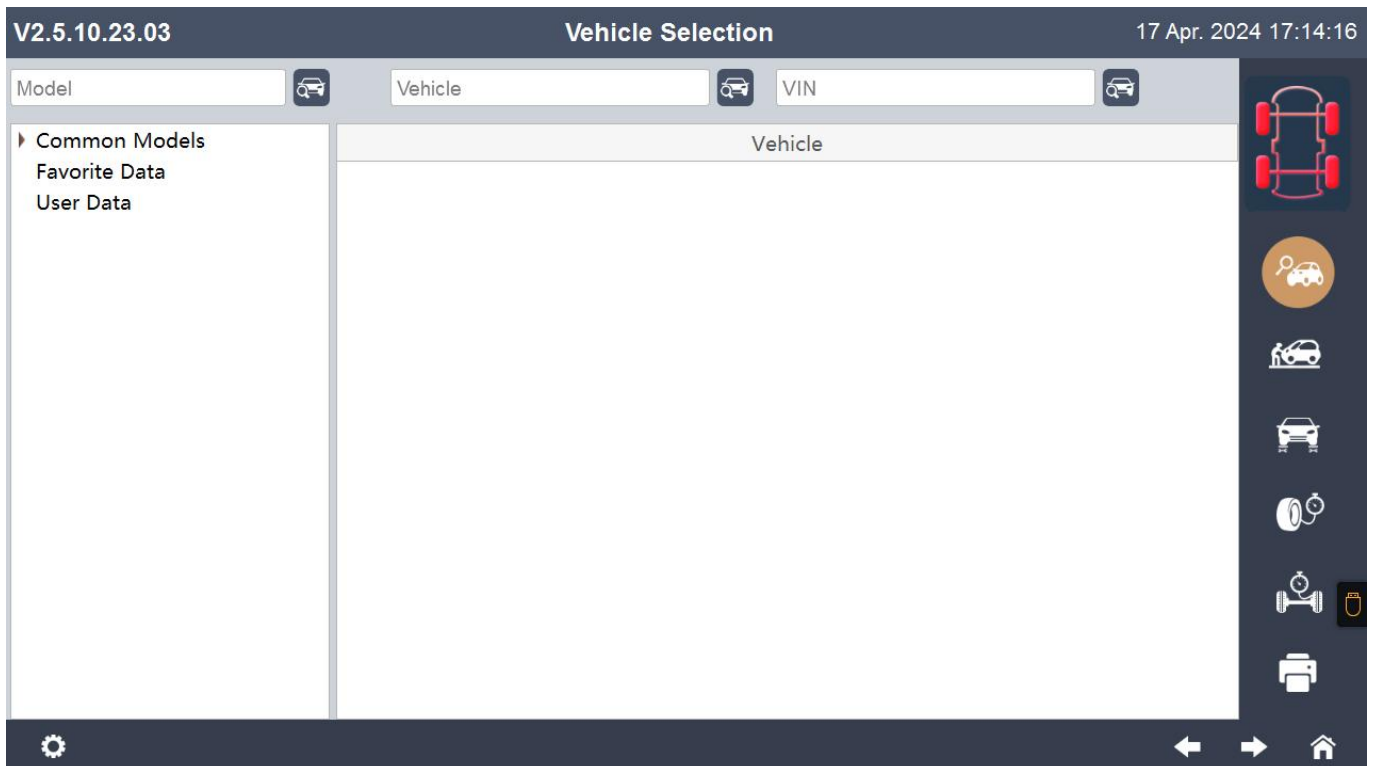
3.2 Software Manual

After open the computer, according to the instruction and enter the home interface.

1. Home page, click “Detection” to start the measurement.



2. Choose database according to car's brand and type. The wheel color is red means the target was covered, not working. The color is green means working.



3. Click "Confirm" icon, then it will turn to the second image. Then click "Go next" icon.

V3.8.20.23.03 Vehicle Selection 16 Apr. 2024 11:45:15

Customer Tel. Data Type 100"

Selected Model EL 2010-2022

Front Axle	«««	»»»	»»»
Total Toe	-0.08	0.08	0.24
Left Camber	-1.0	0.0	1.0
Right Camber	-1.0	0.0	1.0
Left Caster	0.7	1.7	2.7
Right Caster	0.7	1.7	2.7
Left S.A.I	0.0	0.0	0.0
Right S.A.I	0.0	0.0	0.0

Rear Axle	«««	»»»	»»»
Total Toe	0.08	0.16	0.24
Left Camber	-2.0	-1.0	0.0
Right Camber	-2.0	-1.0	0.0

0.0 0.0

0.0 0.0

0.0 Kg

mm

Next Step

V3.8.20.23.03 Vehicle Selection 16 Apr. 2024 11:45:00

Customer Tel. Data Type 100"

Selected Model EL 2010-2022

Front Axle	«««	»»»	»»»
Total Toe	-0.08	0.08	0.24
Left Camber	-1.0	0.0	1.0
Right Camber	-1.0	0.0	1.0
Left Caster	0.7	1.7	2.7
Right Caster	0.7	1.7	2.7
Left S.A.I	0.0	0.0	0.0
Right S.A.I	0.0	0.0	0.0

Rear Axle	«««	»»»	»»»
Total Toe	0.08	0.16	0.24
Left Camber	-2.0	-1.0	0.0
Right Camber	-2.0	-1.0	0.0

0.0 0.0

0.0 0.0

0.0 Kg

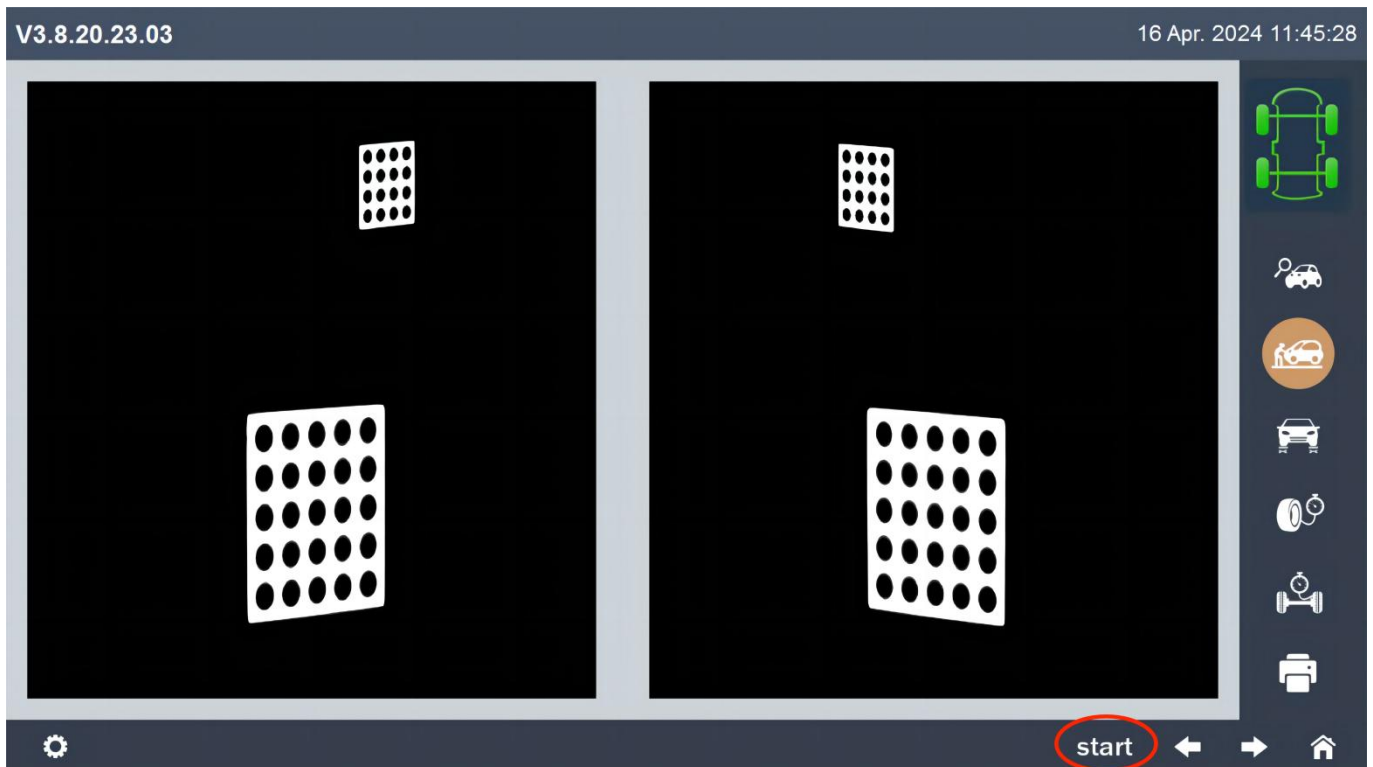
mm

Confirm

Interface Switch

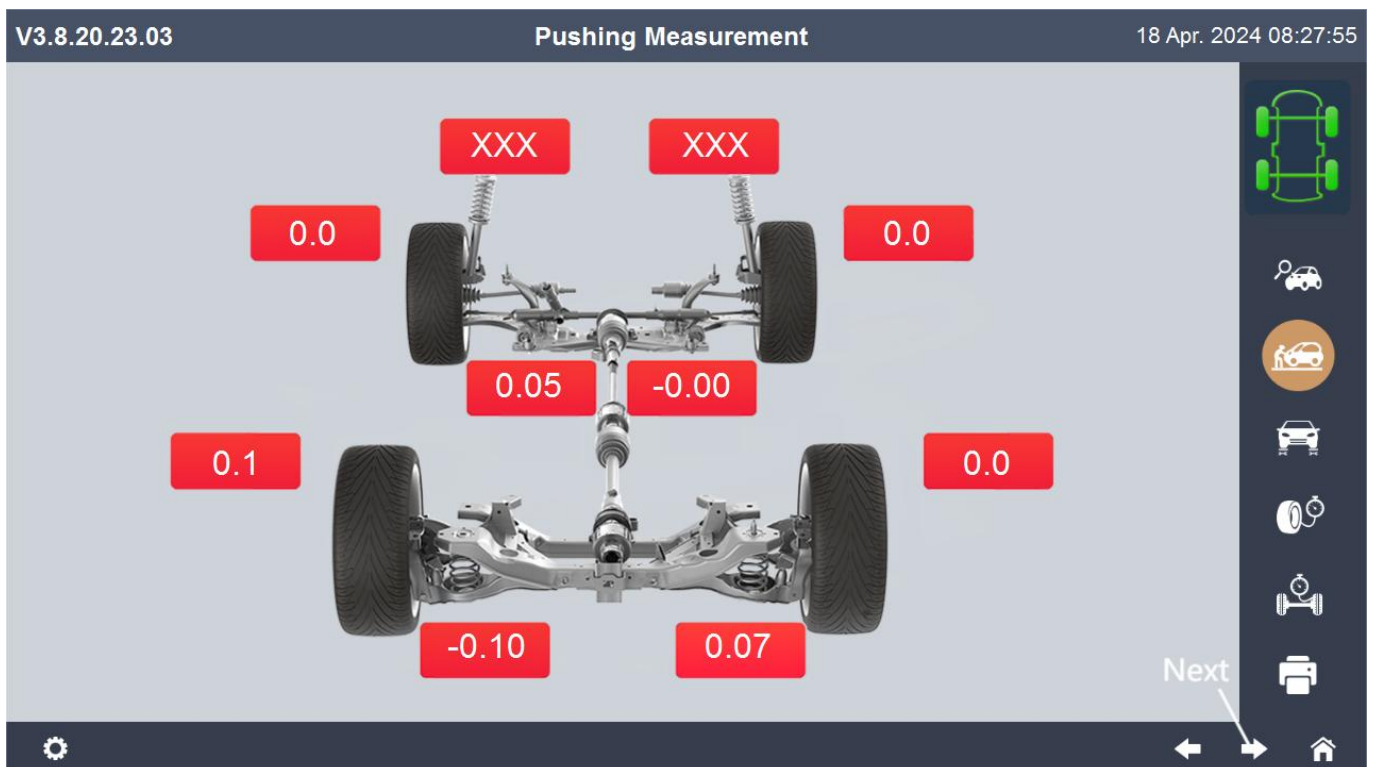
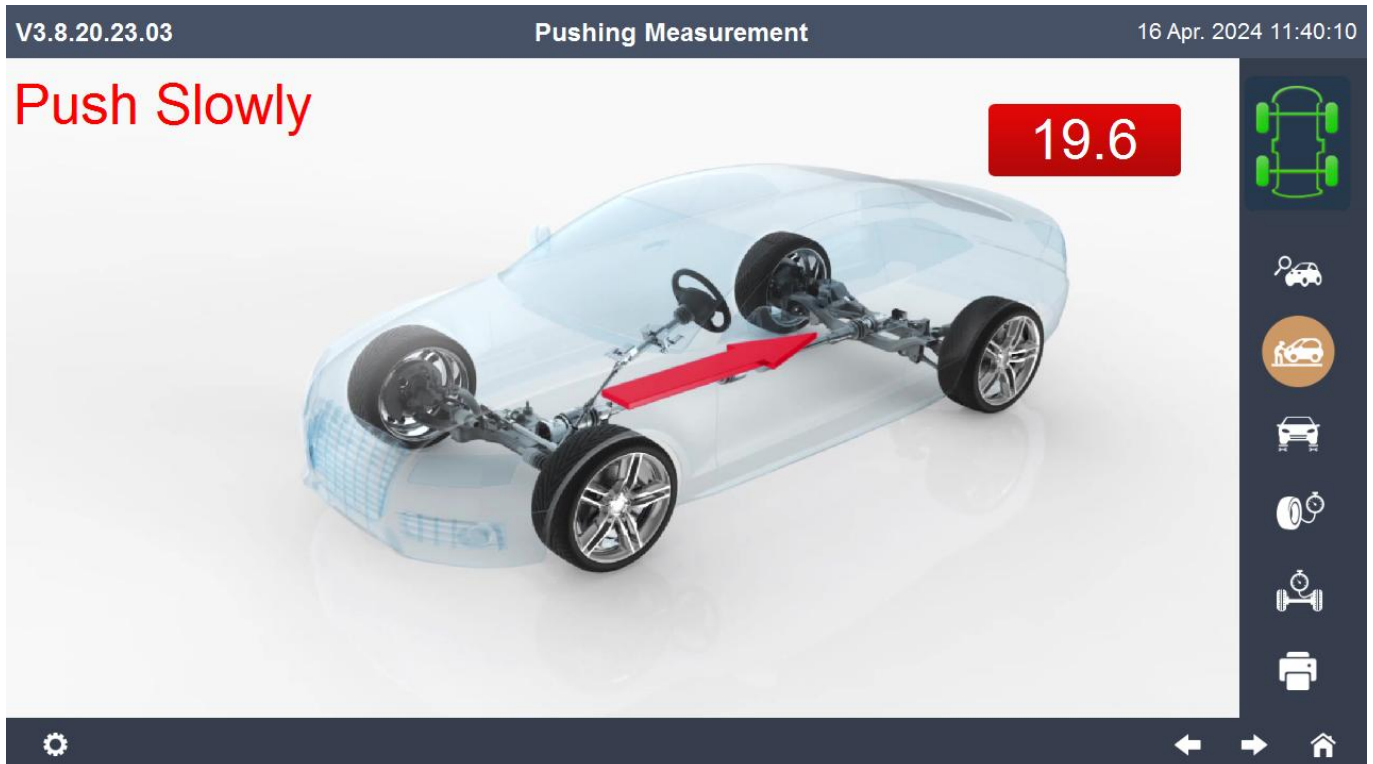
4. Observe the status of the target plates. In this page, the best position of the target plates is in the middle of the screen. Otherwise, through change the height of the vehicle to make sure that the target plates' position is in the middle, Observe the definition of black identification circle that on the targets plates, if it is blurry, please adjust the brightness of infrared lamp

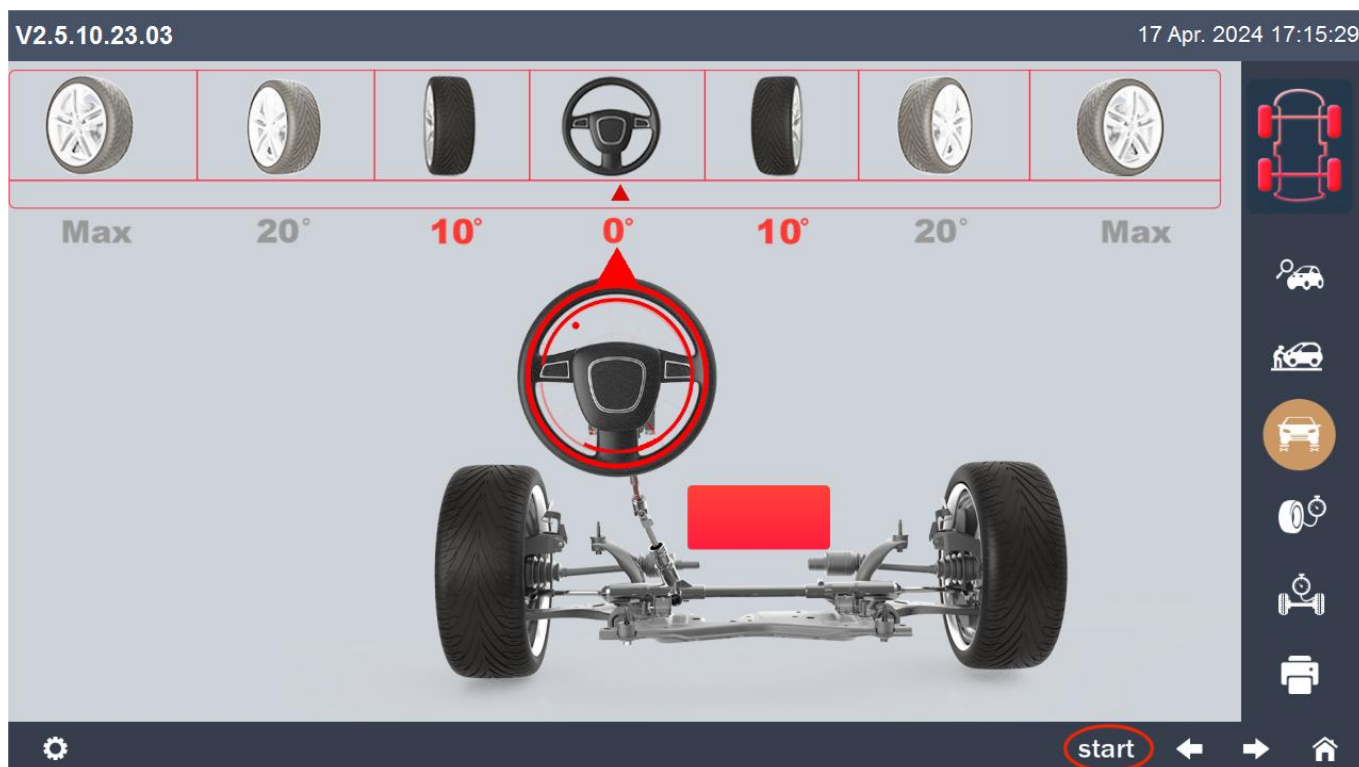
(there are dust on the surface of target plates and dirty camera lens are the reason that cause the target plates blurry.). Then, click "Start."



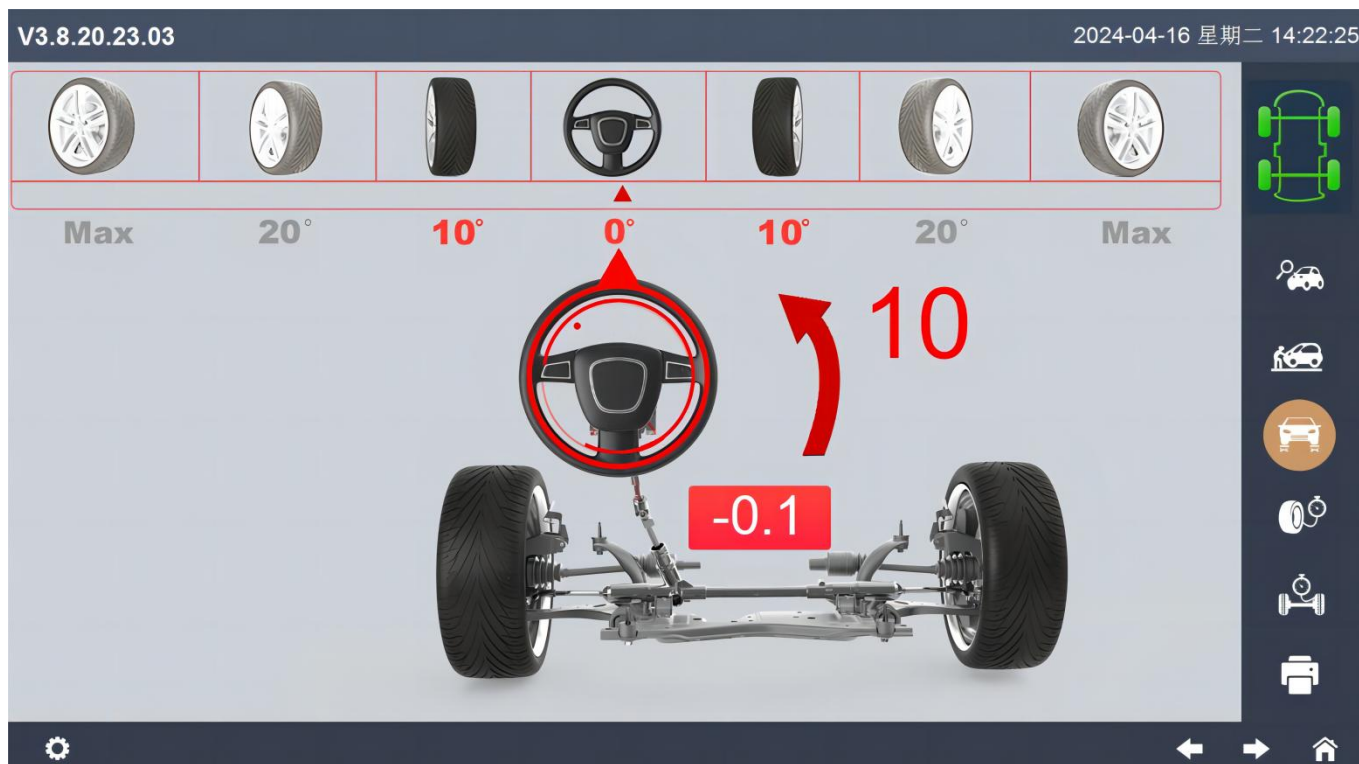
5. Release the handbrake and switch gears to "N". Pushing the car back slowly to the date between 20° ~ 20.5° . When the data be right, software will show a "Stop" icon.



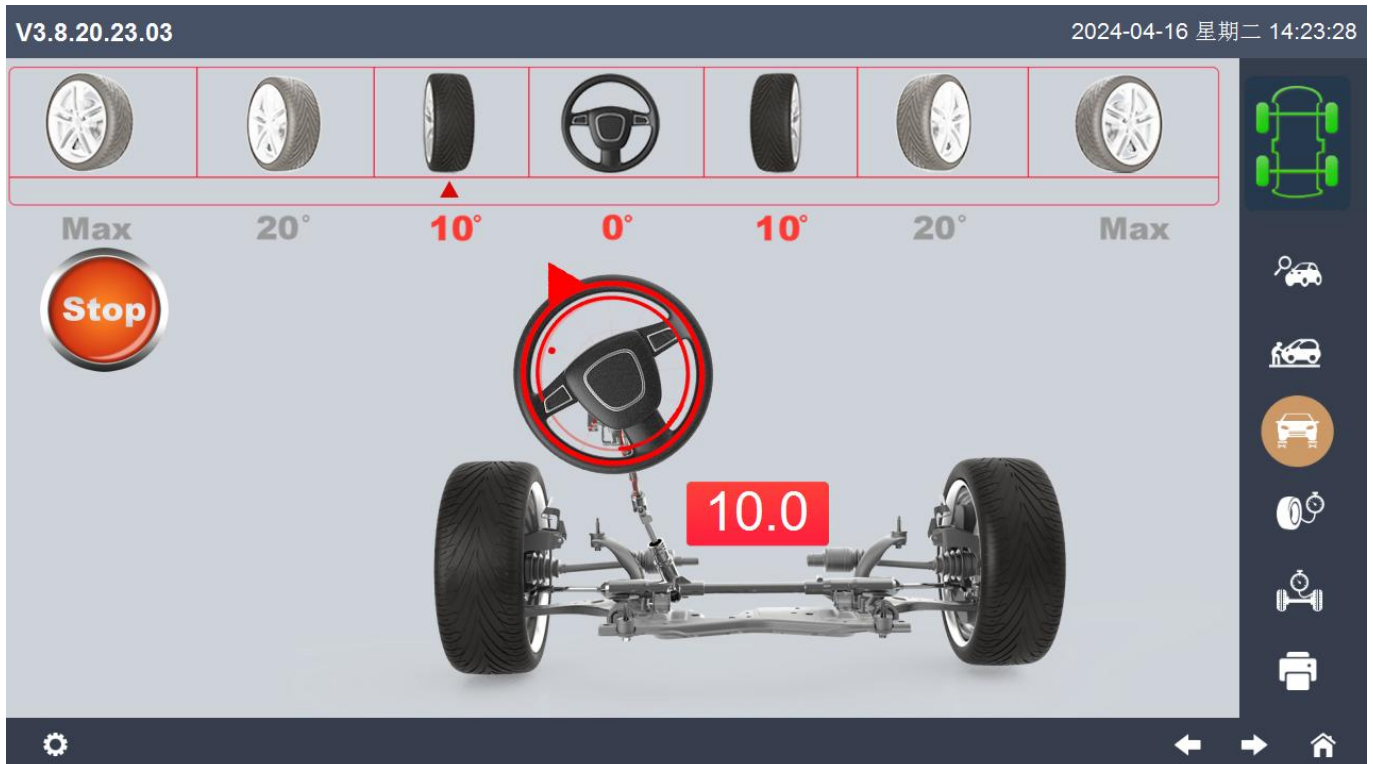




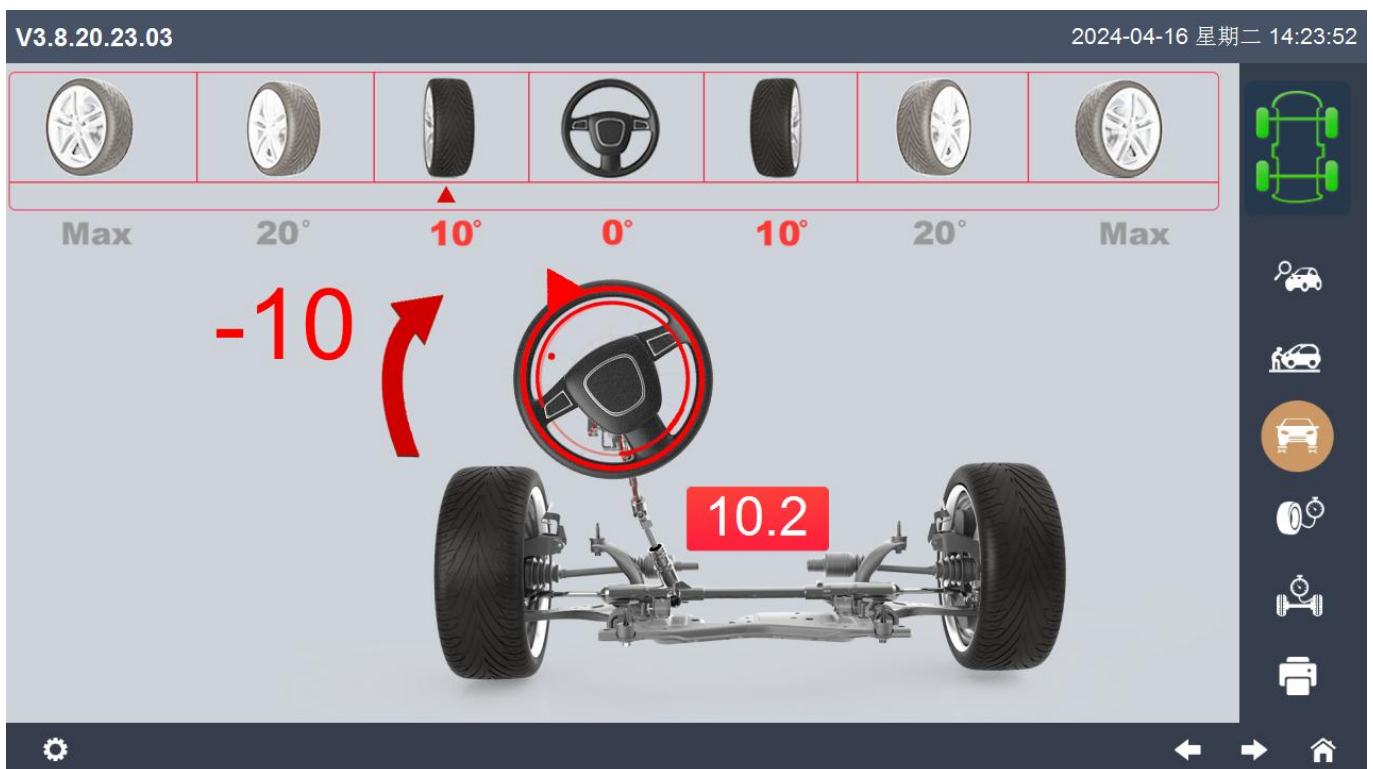
8. Pull out the pin of turntable, hold the hand brake and hold the brakes with the brake fixer

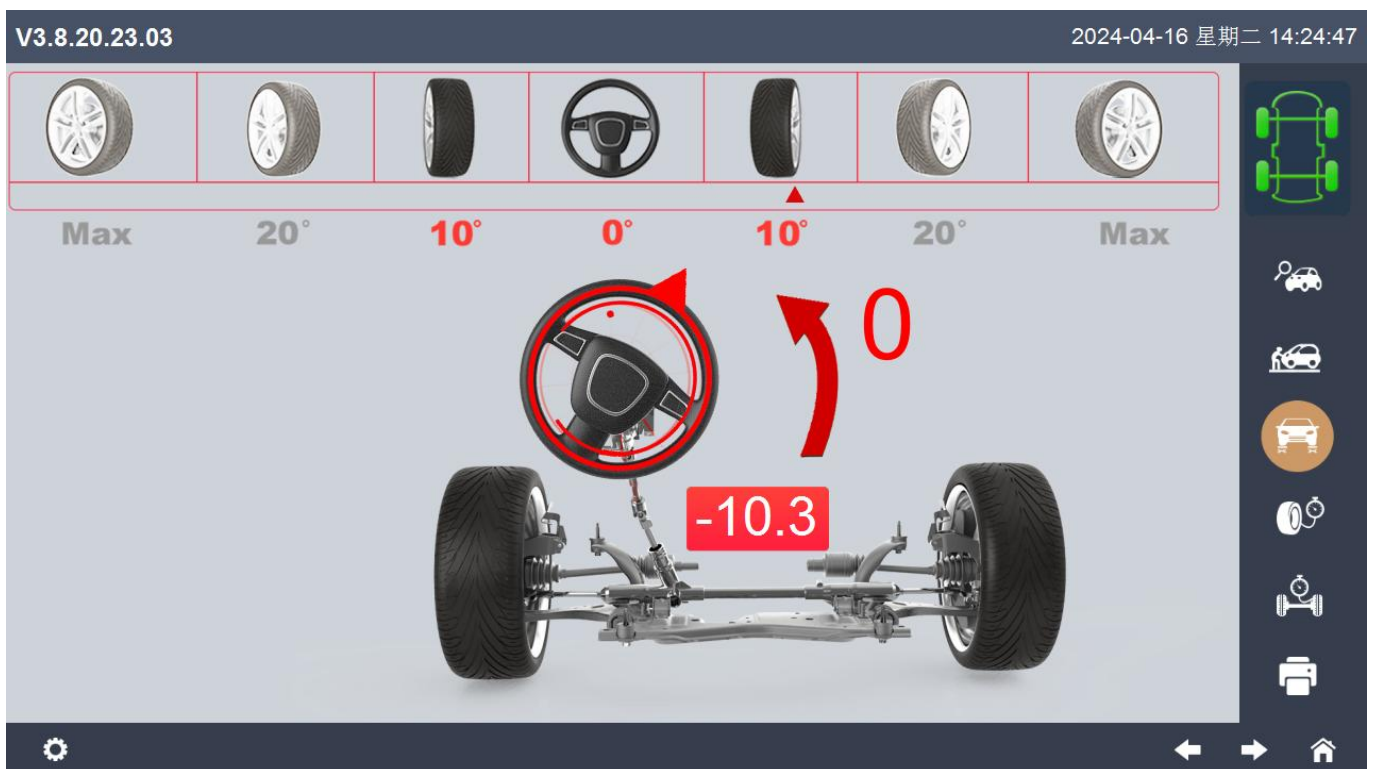
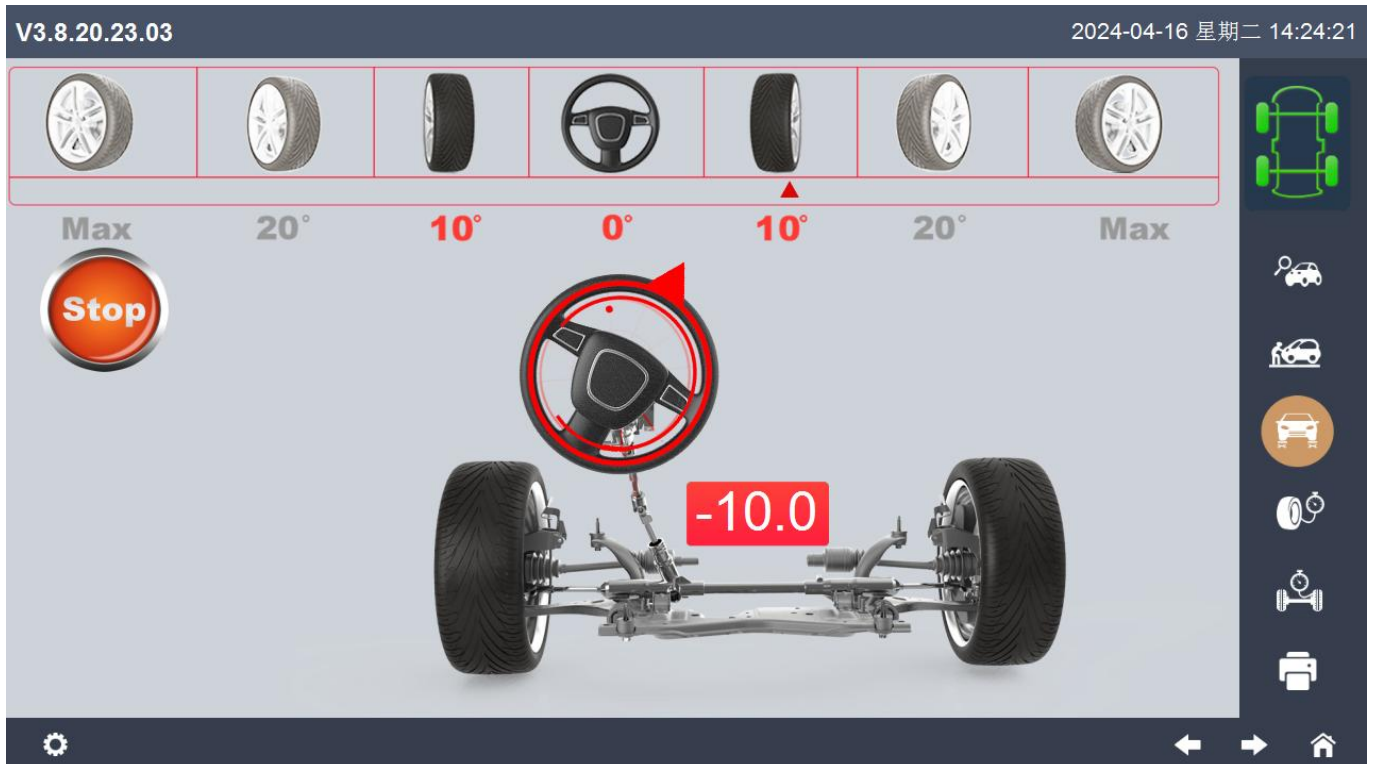


9. Turn steering wheel left to data between 10° ~ 10.5° . When the data be right, software will show a "Stop" icon.

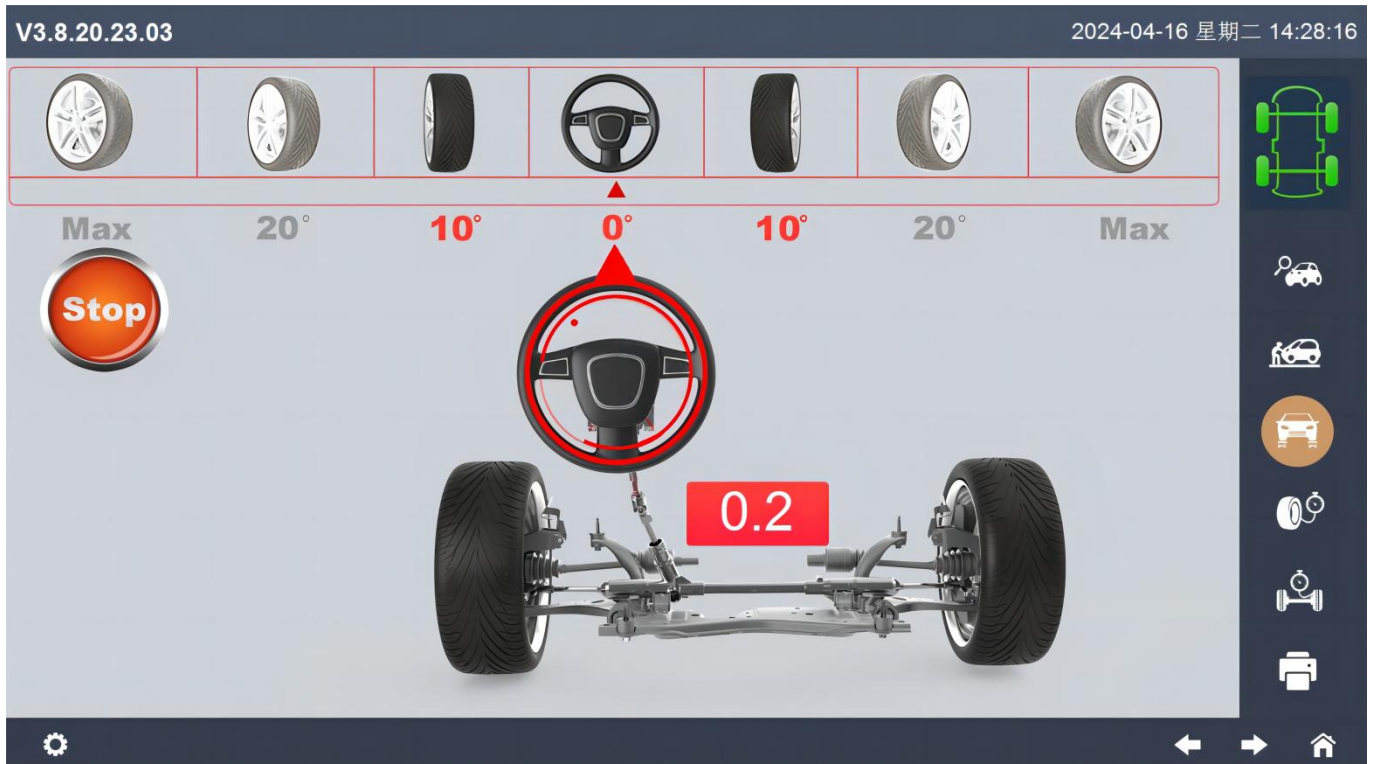


10. It shows “Stop” and prompt turn right to $-10^{\circ}\sim 10.5^{\circ}$. Then, turn the steering wheel back to original position $0^{\circ}\sim 0.5^{\circ}$. Keep the steering wheel in a horizontal position and fix it with a steering wheel holder.





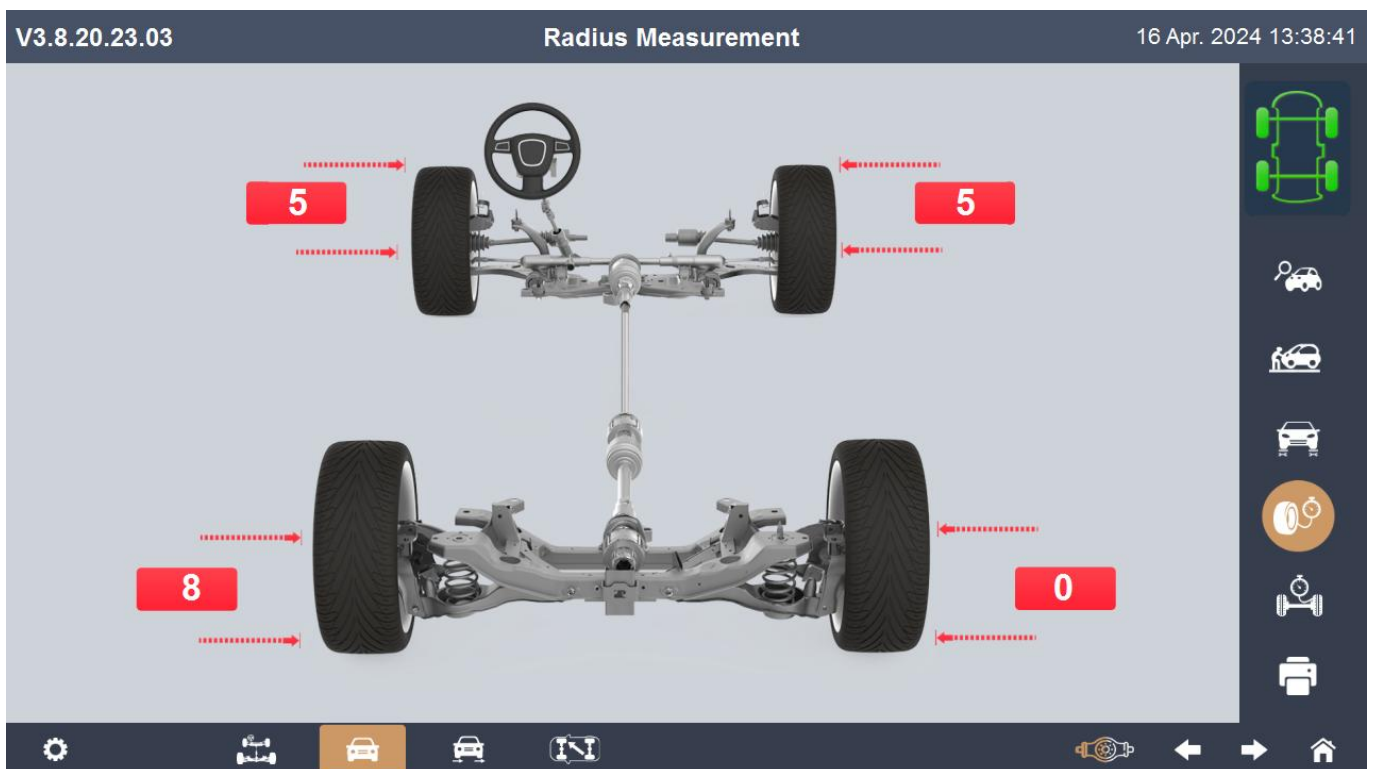
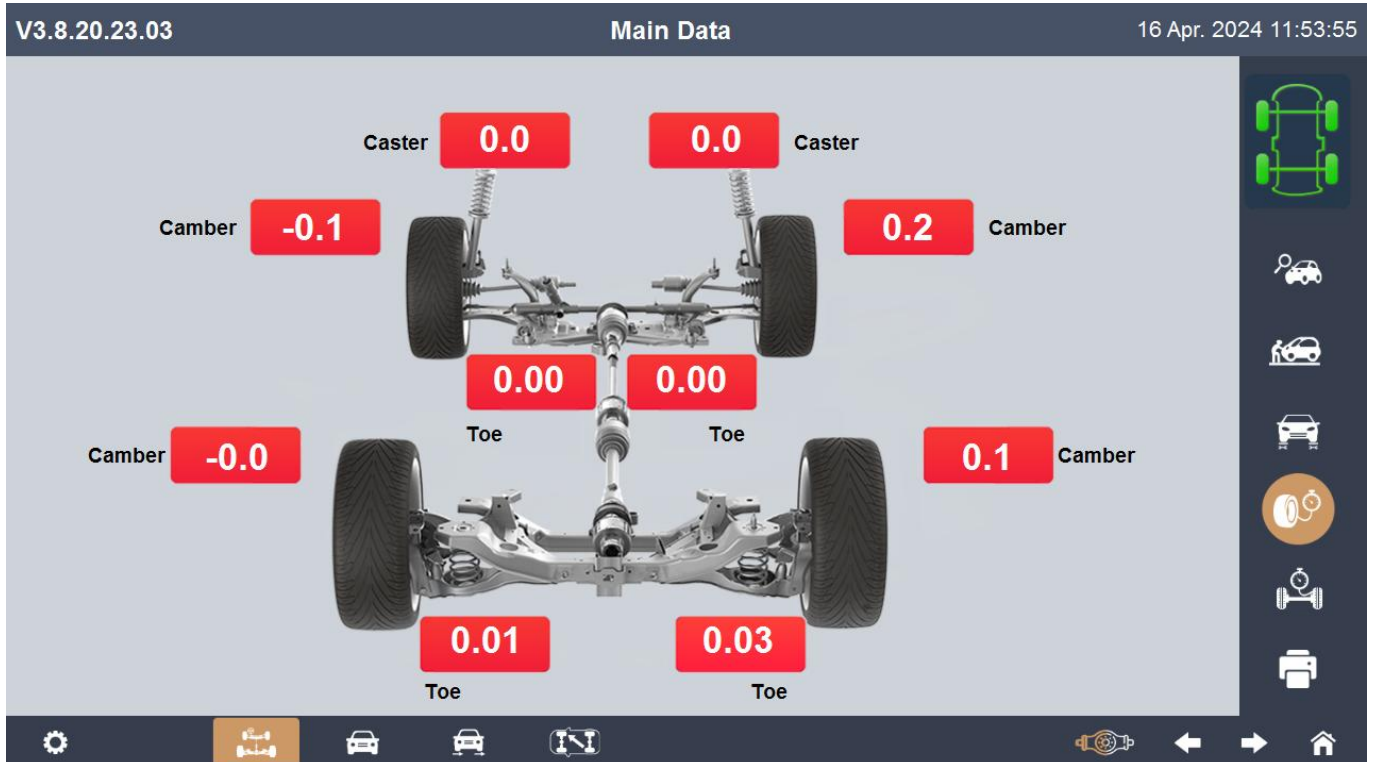
11. When the data be right, software will show a “Stop” icon.

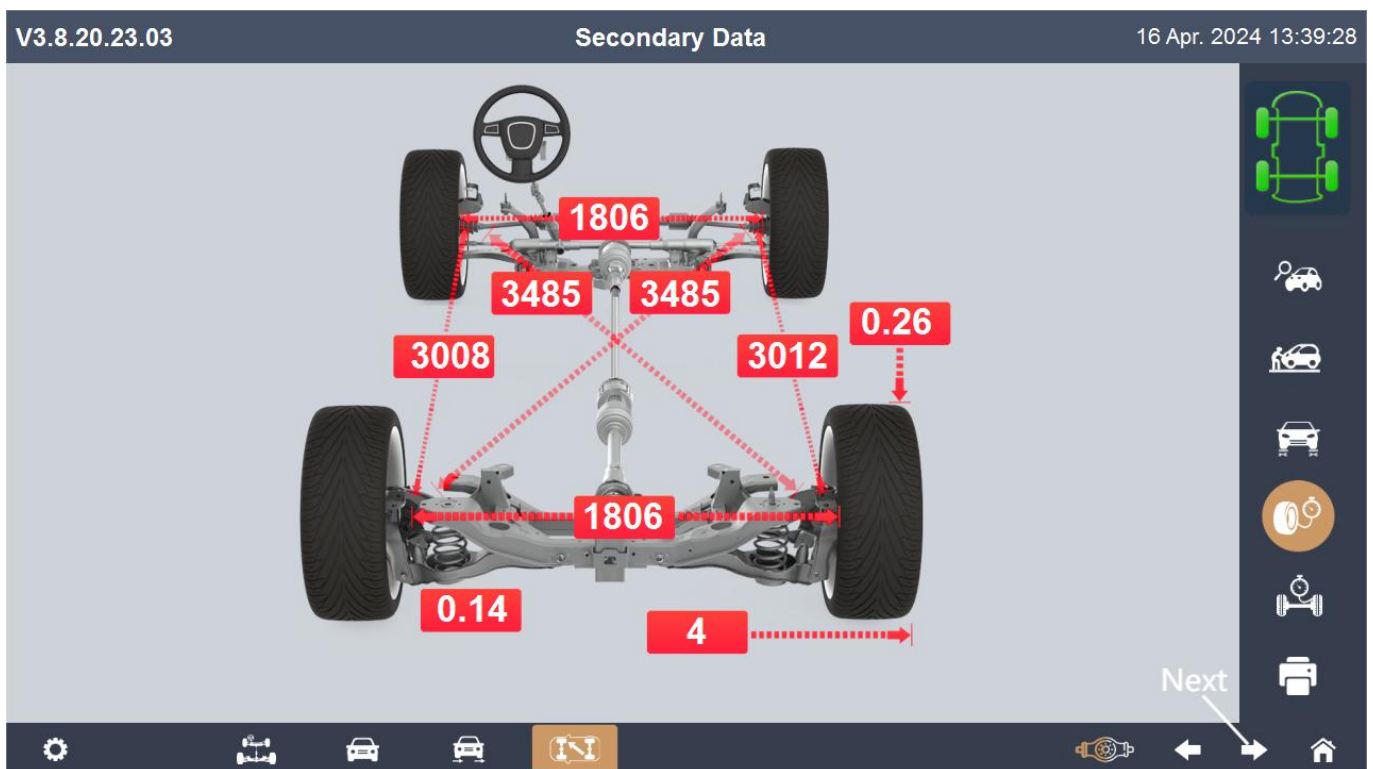
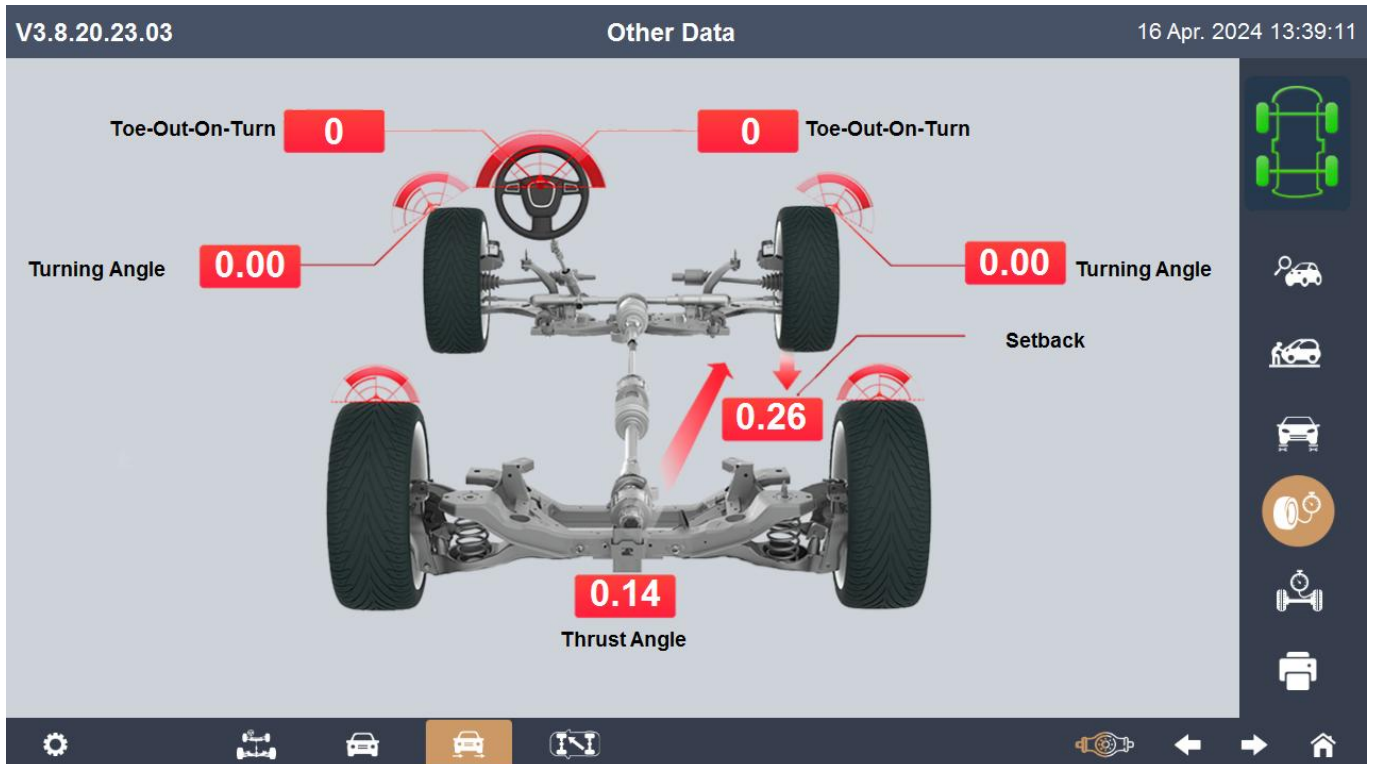


12. After the pin measurement, here will show “Caster” and “S.A.I” data. Then click “Next” to go Data Browse.

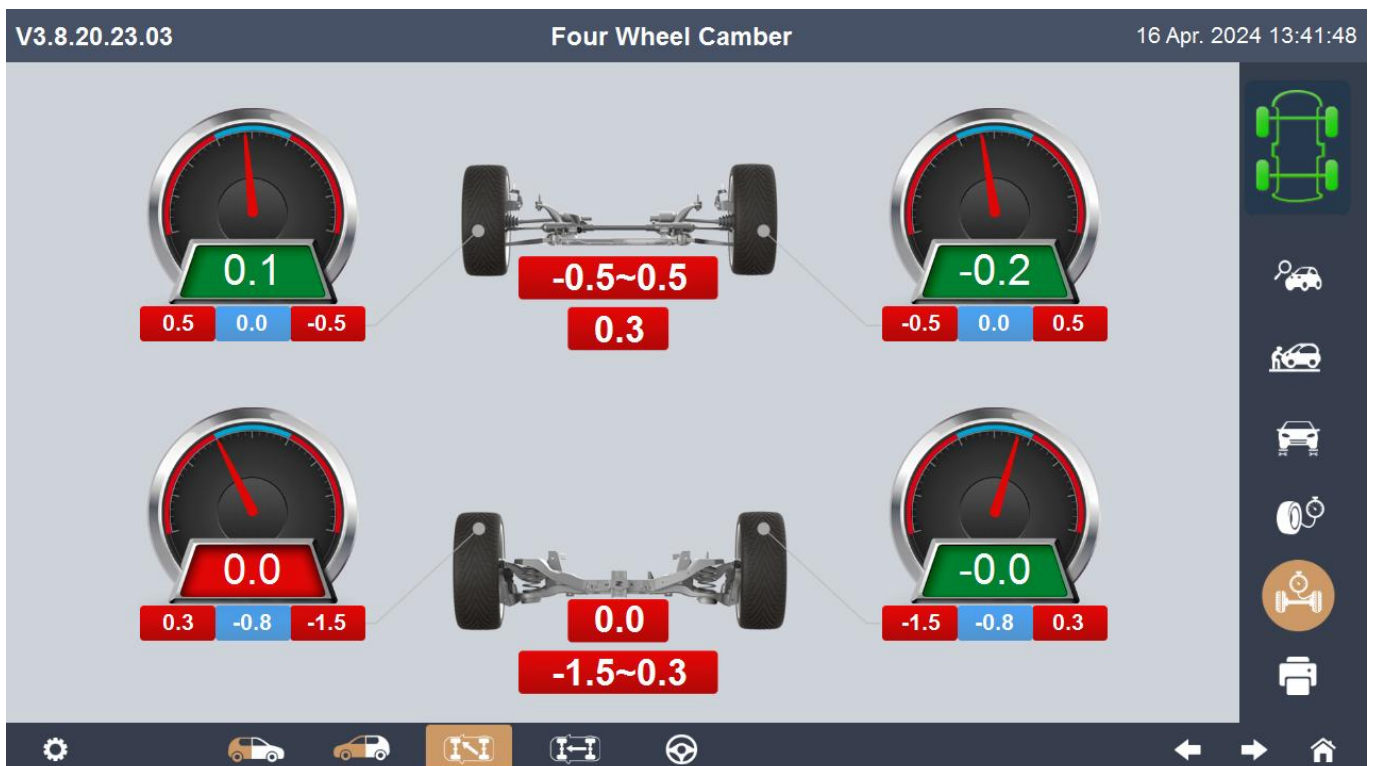


13. In Data Browser, we can view Main Data, Radius Measurement data, Other data and secondary data. Then click “Next” to car adjustment.



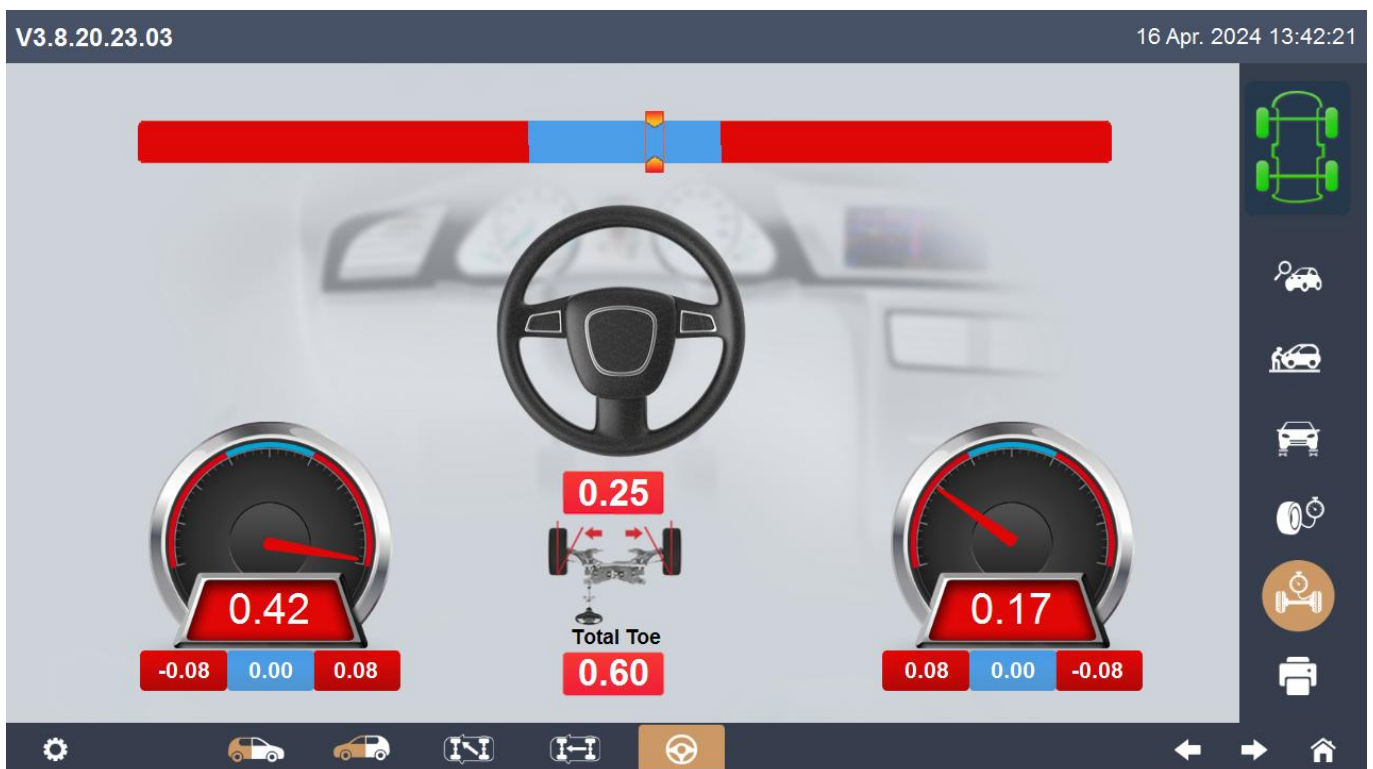


14. In car adjustment, the pin point red area means the data need to be adjusted, and the pin back to green area means the data is correct. We can view rear axle data, front axle data, four wheel camber and four wheel toe.





15. In this page, customer can fast check the steering wheel whether in the center position. If not, to adjust the Toe to make the steering wheel back to center position. When the square icon move to green area, means the steering wheel is in correct.



16. Input measurement information, specially "Plate No." . Click "Save" saving the information

and click “Print” printing the data.

V3.8.20.23.03 **Data Report** 16 Apr. 2024 13:42:34

Customer License No. Date 16 Apr. 2024 Technician

Tel. Mileage 0 ID. Order No. K20240416134232

Front Axle	Std. Data			Measurement Data	Adjustment Data
Left Camber	-0.5	0.0	0.5	0.1	0.1
Right Camber	-0.5	0.0	0.5	-0.2	-0.2
Left Caster	6.0	7.0	8.0		0.0
Right Caster	6.0	7.0	8.0		0.0
Left S.A.I	0.0	0.0	0.0		0.0
Right S.A.I	0.0	0.0	0.0		0.0
Total Toe	-0.16	0.00	0.16	0.60	0.60

Rear Axle	Std. Data			Measurement Data	Adjustment Data
Left Camber	-1.5	-0.8	0.3	0.0	0.1
Right Camber	-1.5	-0.8	0.3	-0.0	-0.0
Total Toe	0.08	0.16	0.24	-0.70	-0.72

Toe-Out-On-Turn Left 0.00 Right 0.00

Turning Angle Left 0.00 Right 0.00

Save Print

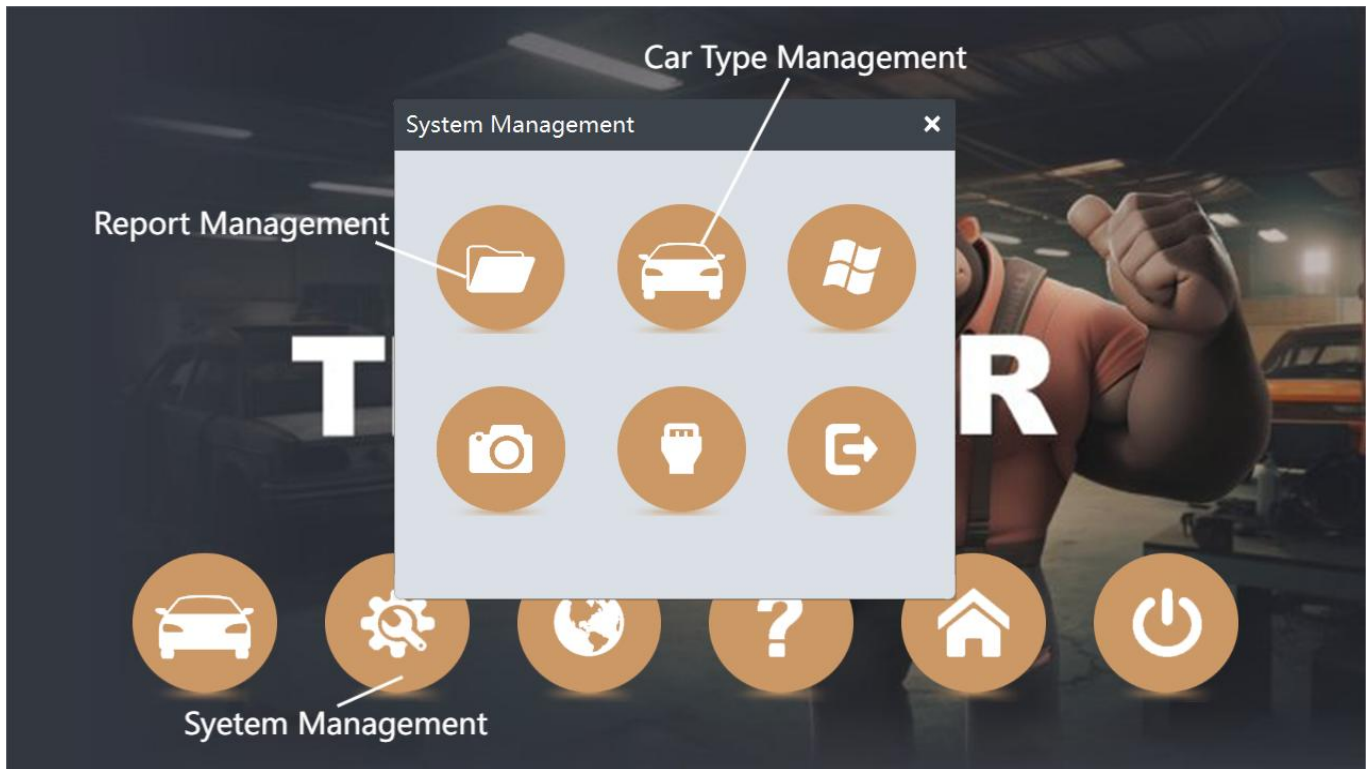
Print X

Model 1

THINKCAR		Tel.					
		Company Add.					
		E-mail					
		Order No.		CX20240416134440			
		License No.		Date 16 Apr. 2024			
		Customer		Model Acura			
		Vehicle		EL 2010-2022			
Option		Std. Data			Before	After	
		Min	Std. Data	Max			
Front Axle Data	Caster	Left	0.7	1.7	2.7		0.0
		Right	0.7	1.7	2.7		0.0
	Camber	Left	-1.0	0.0	1.0	0.0	0.0
		Right	-1.0	0.0	1.0	0.0	0.0
	Toe	Left	-0.04	0.04	0.12	0.00	0.00
		Right	-0.04	0.04	0.12	0.00	0.00
	Total Toe		-0.08	0.08	0.24	0.00	0.00

Close Print

17. Click “System Management”, then click “Report Management” for report enquiry, deletion and other operations. Click “Car Type Management” to enter the next interface.



Adjustment Report

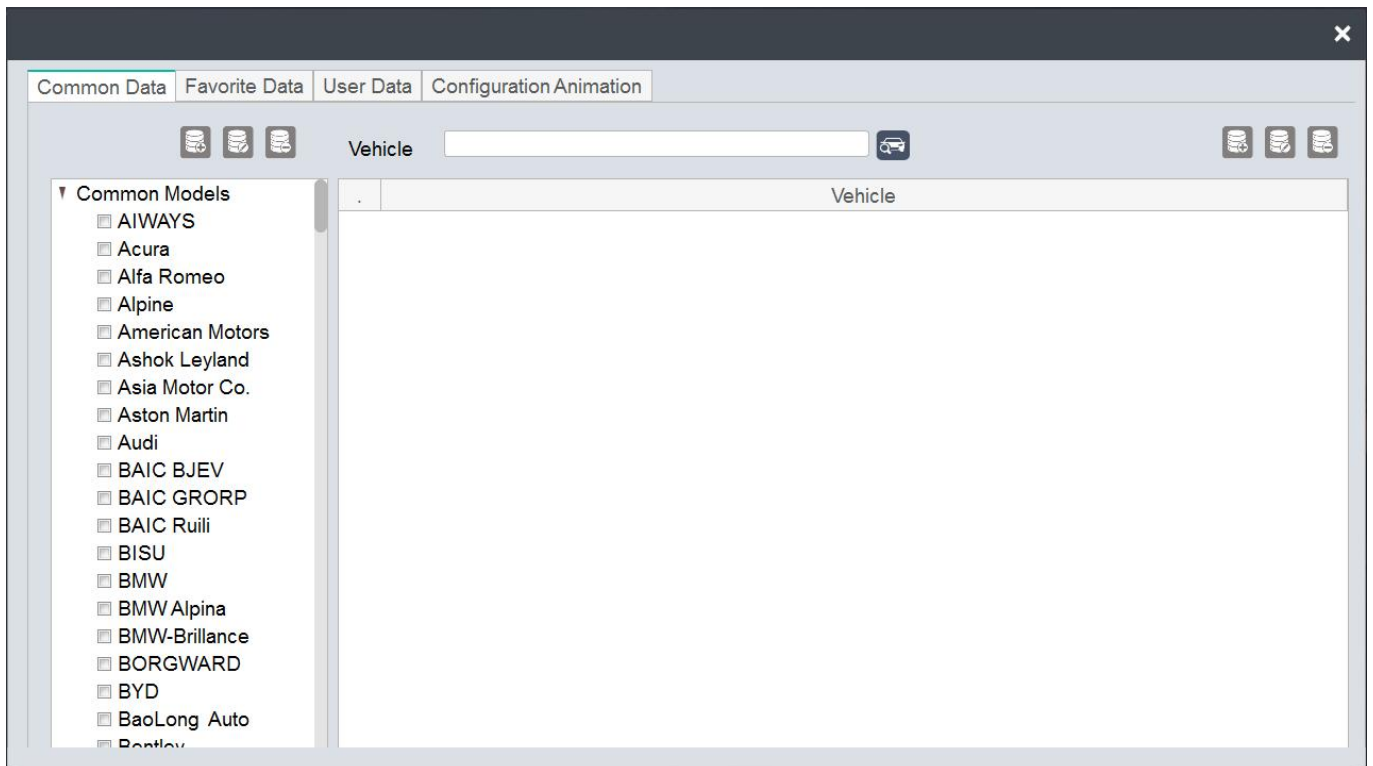
License No. Order

Start Time End Time

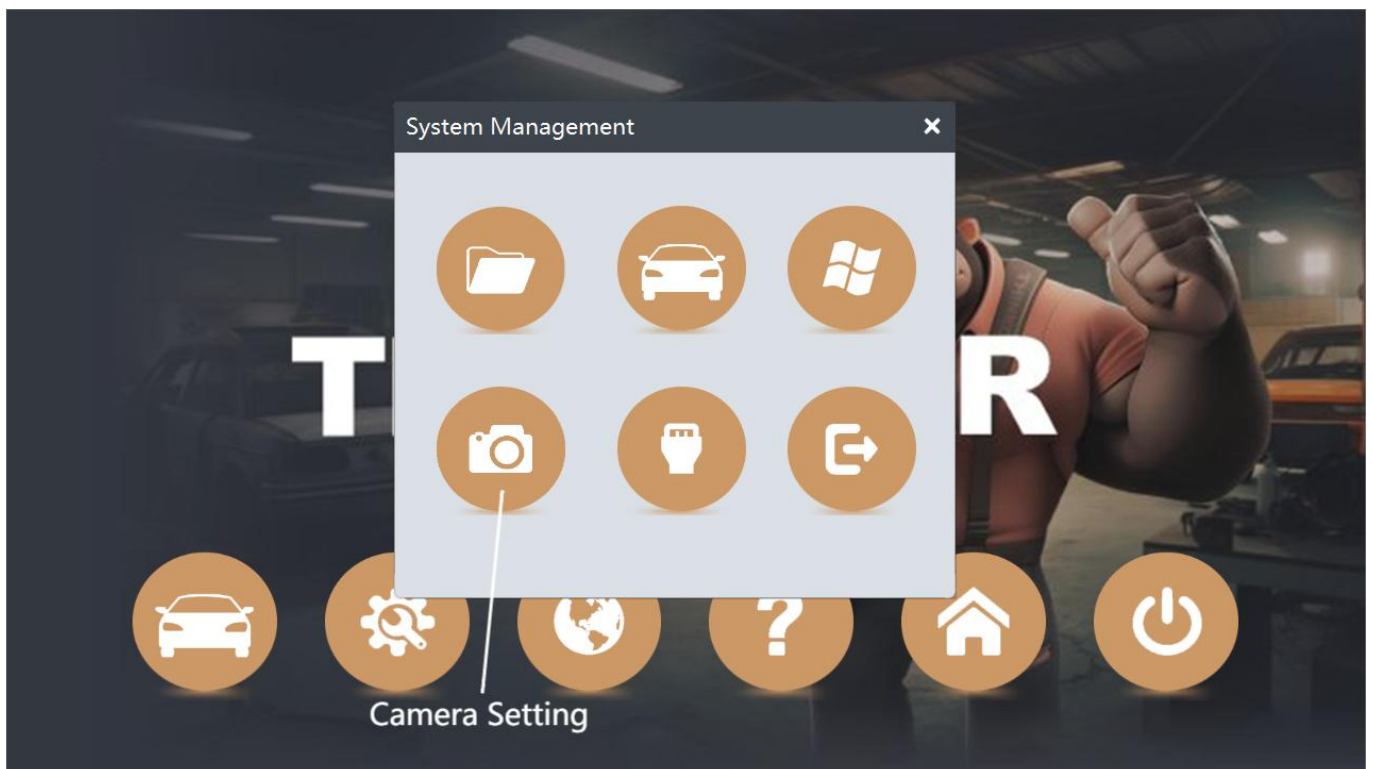
Order	License No.	Date	Customer

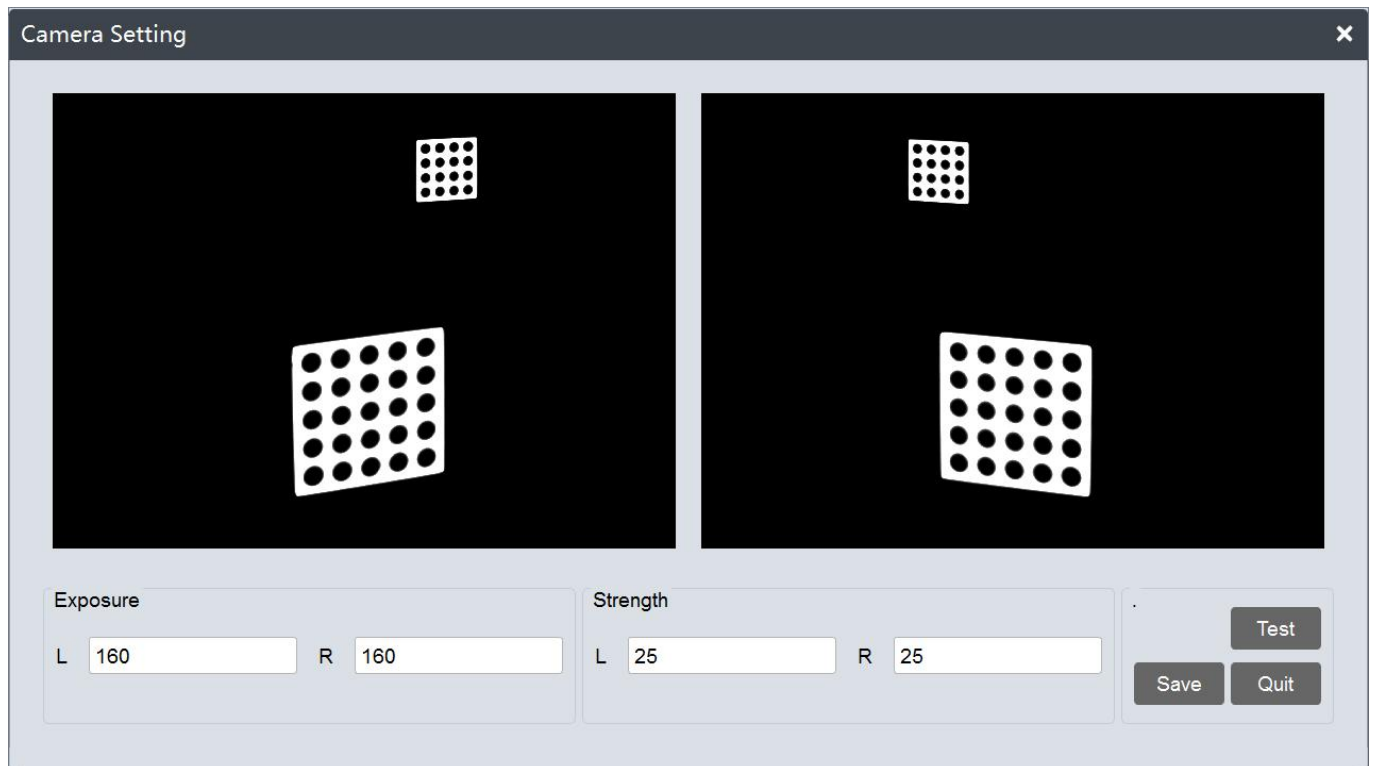
Record
Print
Report Details
Delete

18. To add and delete models on this page: 1. Select the regional brand of the model you want to add on the left; 2. Enter the "Model" and data to add.

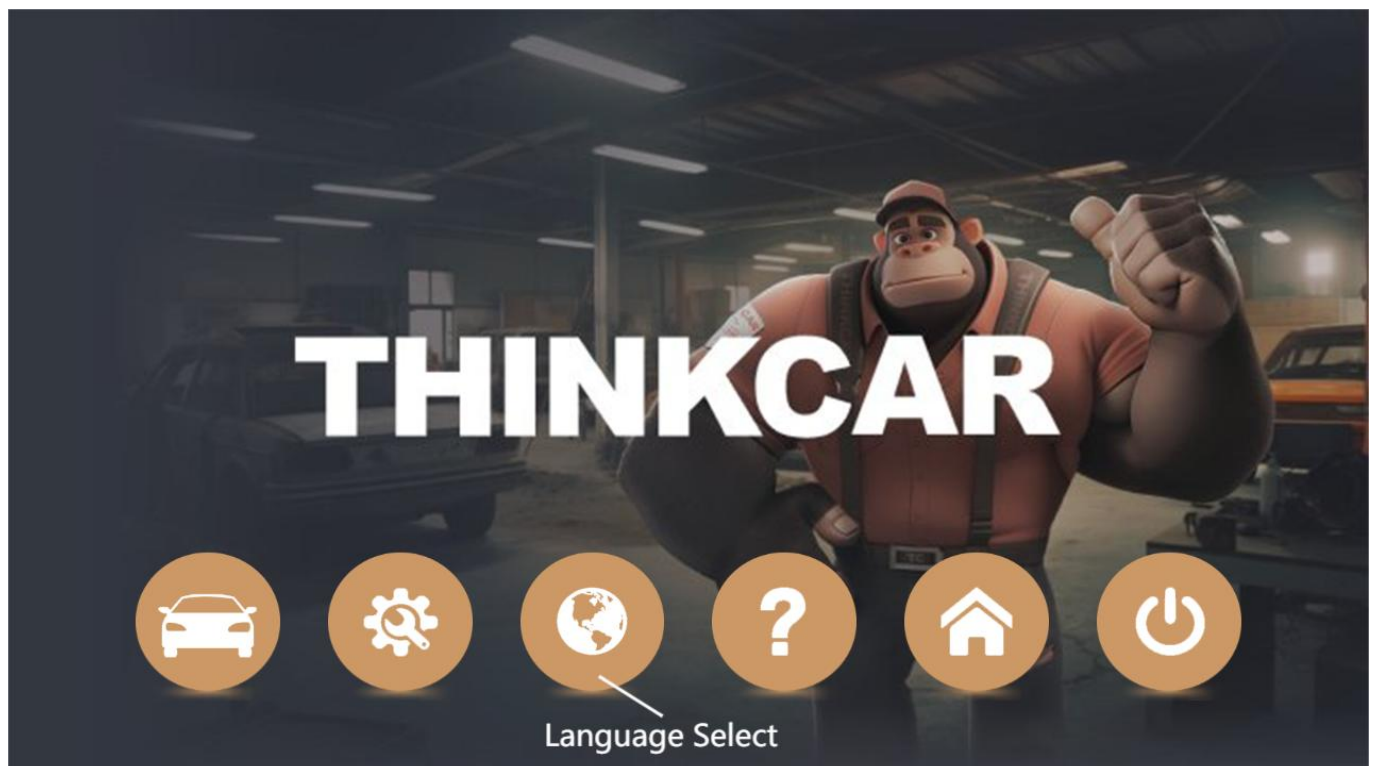


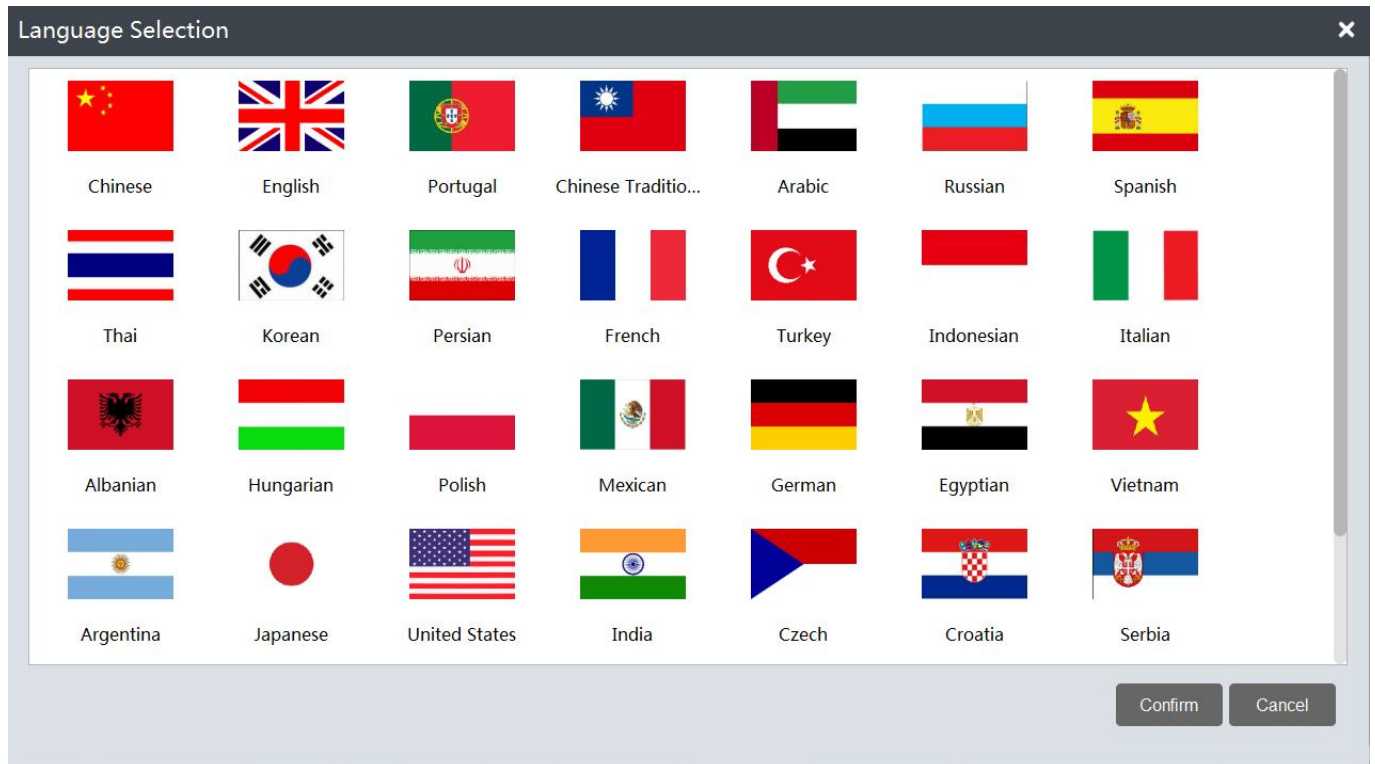
19. Click " Camera Settings" to adjust the exposure and intensity of the camera's light board (the default settings are 160 and 25). Click Save to exit after setting.



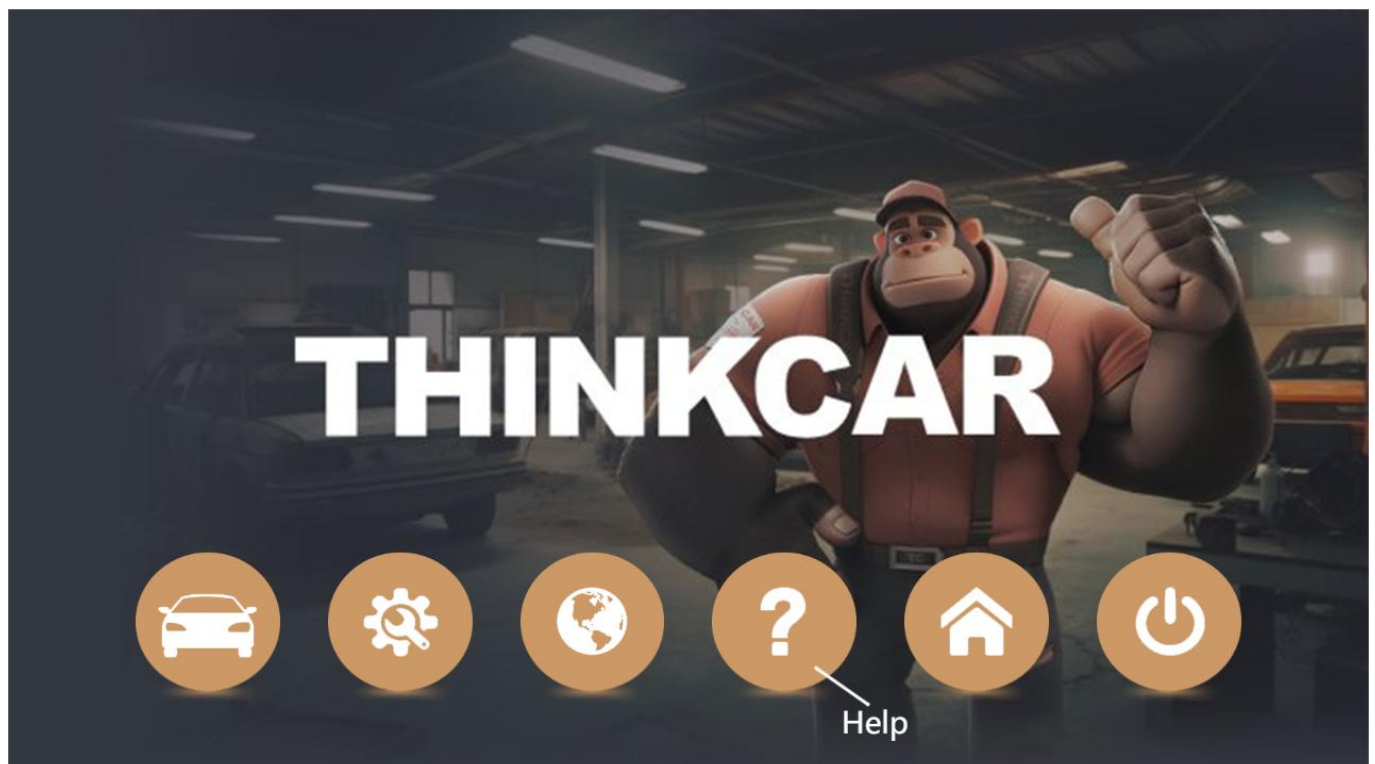


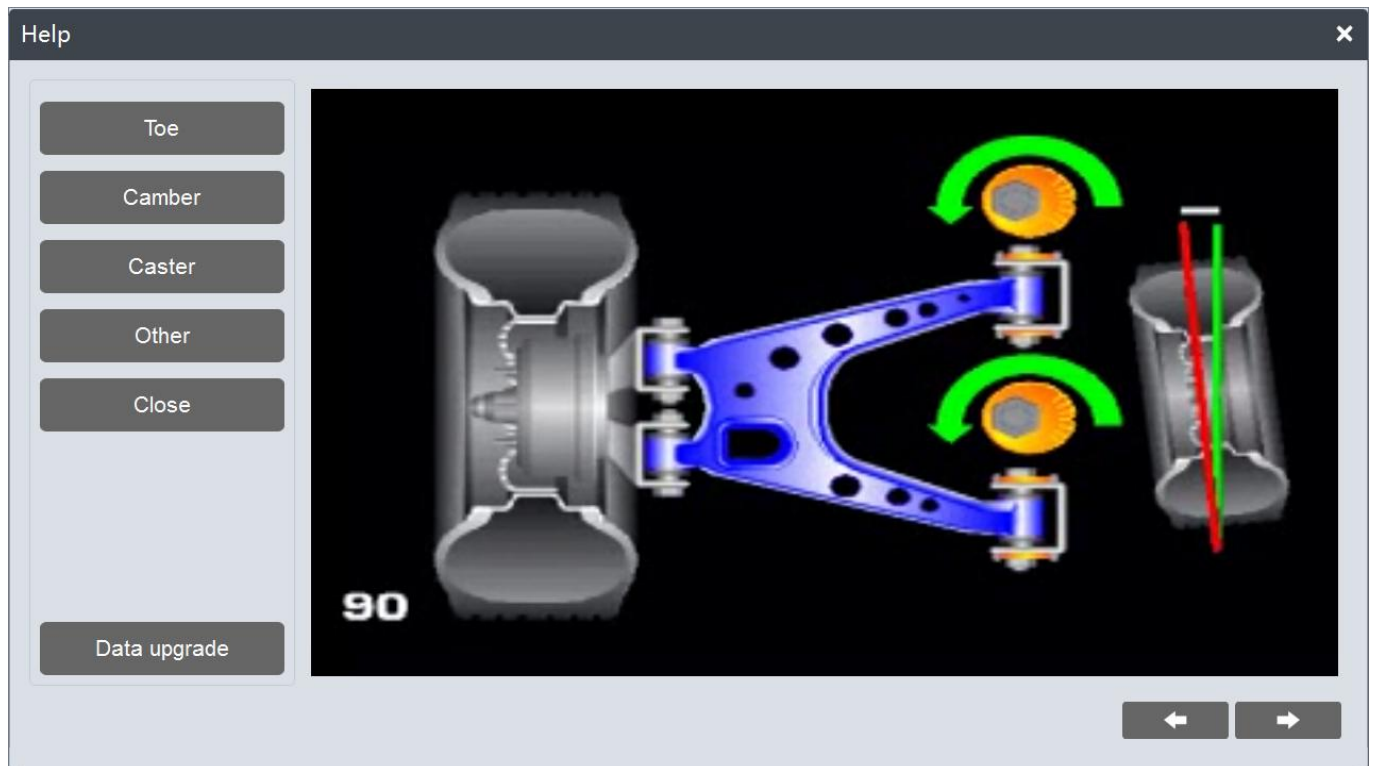
20. The function is language selection.



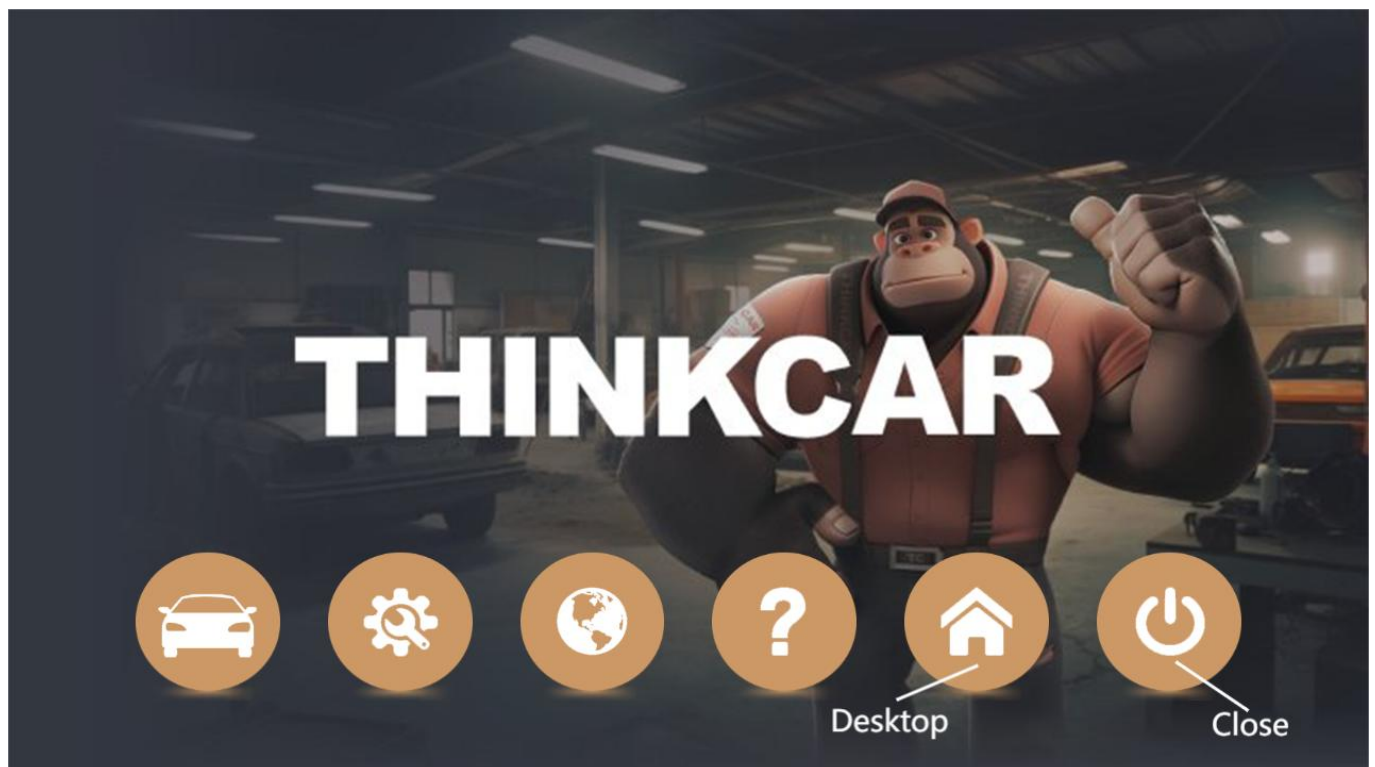


21. Click "Help", enter the 3D animated demo.





22. Click “Desktop” to close software, or click “Close” to shut down the computer and need to enter the password “12345”.



4. FAQ

4.1 Common Problems

1. "NEED TWO CAMERAS" error:

- To check whether there is a installation in camera or camera driver.
- Open several wheel alignment system software, need to closed until there is only one is worked.

2. "SENTINEL KEY NOT FOUND (H0007)"error

- Dongle not be connected or the model of dongle is not match to computer.

3. "SENTINEL KEY NOT FOUND (H0031)" error

- Wheel alignment system don't work, reset system software or relative configuration files.

4. "SENTINEL KEY NOT FOUND (H0041)" error

- Dongle is overdue, need to register again.

5. "ILLEGAL USER,REGISTER PLEASE" error

- "Key" program is incorrect or there is no "Key" in software. In this case, software also can work, but the measurement data is very big.

4.2 Wheel Alignment Maintenance

1. Camera Lens

- If there is a little dust on the camera lens, it is best to blow it instead of wipe it.
- Special camera lens paper are needed when the camera lens were stained with some oil.

2. Target disks

- If there is a little dust on the target disks, it is best to blow it instead of wipe it.
- If there is too much dust on the target disk, using a cotton cloth wipe it gently.

3. Regular maintenance

- Before using large power equipment, should first turn off the device to prevent electric shock, power supply voltage to maintain in the range of 220+1-5%.
- The machine is particular for wheel aligner, please do not use it for other equipment.
- The camera is high precision measuring instrument, move it carefully.
- Unplug is prohibited when the machine is working, Otherwise it will damage the system.

- It is forbidden to illegally computer shutdown,not able to open and close the power switch frequently in a short time.
- Machine should be placed in a cool and dry place, And to keep it clean.
- Do not let the camera face to the sunlight, otherwise the camera can not work normally and will get a wrong data.
- Wheel alignment computer can not be connect with internet, in case of virus.
- If the computer have to connect a USB flash, please make ensure the U flash is safety and then connecting.

Appendix A Packing List

No.	Name	Quantity	Picture
1	Corner plate	2 pcs	
2	Computer	1 unit	
3	Mouse and keyboard	1 set	
4	Target (small)	4 pcs	
5	Clamp	4 pcs	
6	Brake holder	1 pc	
7	Steering wheel holder	1 pc	
8	Monitor (32 inches)	1 unit	
9	Monitor bracket	1 pc	

10	Chassis power cord	1 strip	
11	Rack lifting column	1 pc	
12	Camera beam	1 pc	
13	LOGO hat	1 unit	
14	Clamp lanyard	4 strips	
15	Wedge-shaped pad	2 pcs	
16	Static ground pin	1 strip	
17	Beam bracket	1 pc	

18	Cabinet (with independent power supply)	1 unti	
19	Monitor HD cable	1 strip	
20	Lifting controller (including remote control)	1 pcs	
21	No. 4 screw	6 pcs	
22	No. 6 screw (with cap, M6*8MM)	4 pcs	
23	No. 6 screw (M6*16MM)	4 pcs	
24	No. 6 T-type screw (with cap)	13 pcs	
25	No. 8 T-type screw (with cap)	4 pcs	

26	Clamp bracket screw	12 pcs	
27	Column fixing screw	4 pcs	
28	Cabinet ears	2 pcs	
29	Instruction manual	1 book	
30	Certificate of conformity warranty card	1 set	

Appendix B Four-wheel alignment related information

1 Definition of Wheel Alignment

With the rapid development of automobile technology, the continuous improvement of vehicle speed, the actions of rapid acceleration, rapid deceleration, acute steering, emergency braking and other occurred more frequently, the front and rear wheel of car are impacted in the process of driving, which will all affect the trajectory of the rear wheel of the car. To ensure the stability of the straight running of the car, the steering is easy to turn, and reduce the wear degree of tires and it parts, increase the safety of the driving process, we must consider all factors that determine the angle formed by the car wheel and the ground. Therefore, more and more drivers have paid attention to the technical parameters of four Wheel positioning. Nowadays, four wheel positioning refers to in the process of installation the geometric angle and dimensions the of the wheel, the suspension system components and the steering system components must meet certain requirement to ensure the stability and safety of the car, and also to reduce tire wear and fuel consumption. Four wheel positioning also provides favorable conditions for the development of automatic driving technology.

Vehicle chassis and tires are particularly important to the stability of the car. Once the chassis and the tire occurs some problem, the vehicle will shiver, floating, tire wear uneven, steering deviation, steering wheel can't be centered, hard to turn steer wheel, abnormal driving condition and others. The symptoms will not only greatly lower the driving experience, but also cause increased fuel consumption, driver's driving fatigue and even serious accident.

We have to know the cause before solving the problem. Car is composed of engines, electrical equipment, body and chassis. Each part is based on the chassis and tires as the bearing platform. Every car before leaving factory was aim to provide the user a comfortable and safe driving experience. Each car has set a corresponding wheel angle to ensure the normal driving of the vehicle before leaving factory which is collectively referred to as four wheel positioning Wheel angle. Four wheel positioning angle, including the toe, camber, the kingpin inclination, thrust angle and so on. Each wheel has its own most appropriate angle according to the original design of its four wheel, its manufacture process and body size and weight, wheelbase

wheelbase, etc. The purpose to do four wheel positioning is to through the accurate measurement by 3D four wheel alignment on the car, and then adjust and repair the car according to the measurement results and the original parameters of the car chassis to make the four wheel angle of the car to restore to its best driving state and standards, to achieve the best driving experience. Only when the car wheel positioning data is accurate, can its handling performance and stability be in the best condition, and prolong the tire's lifetime.

The vehicle chassis is composed of transmission system, suspension system, driving system, braking system and steering system. Driving hanging system is classified to various chassis structure according to different car models to ensure the best driving experience. Two most common chassis are double swing arm type and McPherson type. The original positioning parameters will be changed when the car encountered some external impact or its chassis weaved, which will cause some abnormal driving conditions.

2 The Advantages of Wheel Alignment

To solve these problems mainly: tire uneven wear, steer wheel can't go back to center, steer wheel hard and heavy to turn, car shivering, floating.

- (1) Improve the safety of drive
- (2) Steer wheel in the center when driving in a straight line
- (3) Steer wheel go back to center automatically after turning around
- (4) Reduce fuel consumption
- (5) Reduce tire wear
- (6) Keep driving in a straight line
- (7) Improve the control feel of feeling
- (8) Reduce suspension parts wear

3 How long and What Condition The Car Need to Be Aligned

1. After drive for 10,000 km or six months.
2. Vehicle pulls sideway when driving in a straight line.
3. Hands can't get off the steer wheel when driving in a straight line.
4. Steer wheel can't get centered itself, when car runs in a straight line.

5. Car body goes up and down.
6. Front or rear wheel wear.
7. After replacing a new tire.
8. After a crash accident.
9. After replacing a new suspension or turning parts.
10. New car after driving for 3000 km before operating the elevator, please read and understand the safety operation instructions carefully.

Warranty terms

This warranty applies only to customers and dealers who have purchased Thinkcar products through the normal course of business.

For a period of one year from the date of delivery, Thinkcar Inc. warrants its electronic products against damage caused by defects in material or workmanship. Damage to this equipment or parts caused by misuse, unauthorized alteration, use for purposes other than those for which the product was designed, or failure to operate in the manner specified in the instruction manual is not covered by this warranty. Damage to automotive gauges caused by defects in this equipment is limited to repair or replacement only, and Thinkcar is not liable for consequential or incidental damages. Thinkcar will determine the nature of the damage to the equipment in accordance with its own prescribed methods of inspection. No agent, employee, or commercial representative of Thinkcar is authorized to make any confirmation, recommendation, or promise in connection with Thinkcar products. No agent, employee or commercial representative of Thinkcar is authorized to make any confirmation, representation or promise with respect to Thinkcar products.

Waiver of Declaration

The above warranty may be substituted for any other form of warranty.

Order Notification

Replacement parts and optional accessories can be ordered directly from Thinkcar authorized dealers, please specify the quantity, part number and part name.

Customer service center

If you encounter any problems during the operation of the equipment, please call: 400-8888-057.

When the equipment needs to be repaired, please send it to Thinkcar with the warranty card, product certificate, purchase invoice and a description of the problem. If the equipment is within the warranty, Thinkcar will repair it free of charge; if the equipment is outside the warranty, Thinkcar will charge for the repair and add the return shipping cost.

Thinkcar Company Address:

2606, 26/F, Building 4, Phase II, Tianan Yungu Industrial Park, Longgang District, Shenzhen, Guangdong, China, Thinkcar Technology Co., LTD

After-sales e-mail: service@thinkcar.com

Thinkcar website: www.thinkcar.com

Statement:

Thinkcar reserves the right to change product design and specifications without prior notice. The appearance and color of the actual product may differ from that shown in the manual, please refer to the actual product. We have tried our best to make all the descriptions in the book accurate, but there are still some inaccuracies, if you have any questions, please contact the dealer or Thinkcar after-sales service center, the company does not assume any responsibility for any misunderstandings arising from the consequences.