CUSTOMTOOLZ INC

AUTOMOTIVE EQUIPMENT SPECIALISTS

# ITEM NO:CT-WA990

FOLLOW THE INSTRUCTIONS CAREFULLY TO GRANT THE MACHINE A CORRECT FUNCTION AND LONG SERVICE LIFE.

KEEP THE MANUAL NEAR THE MACHINE ALL TIME AND MAKE SURE ALL USERS HAVE READ THIS.

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# I. Introduction

The purpose of this manual is to provide the owner and operator of the imaging wheel aligner with safe and practical instructions for its use and maintenance.

Following all instructions carefully will assist you in your work and give long term and efficient service. The following paragraphs define the levels of danger associated with warning captions in this manual.

## 1.1 Warning

The Aligner is designed for INDOOR USE ONLY. Exposure to damp or wet locations will cause damage to the aligner's components or injury to the user and will void warranty.

The computer may have the ability to connect to the internet, intranet, a local or wide area network. DO NOT connect the computer to any network or the internet unless instructed to by a manufacture or authorized technician.
DO NOT install any 3rd party software or hardware into or onto the aligner as it may cause conflicts with Aligner software or drivers. Failure to comply will void aligner warranty

Do not plug the cabinet power cord in until all connections have been verified. Damage or injury can result.

Insure all installations on this aligner are legal in your country.

## 1.2 Safety warning

This Imaging Aligner is intended for use by properly trained, skilled automotive technicians. The safety messages presented in this section and throughout the manual are reminders to the operator to exercise extreme care when performing wheel alignments with this product.

There are many variations in procedures, techniques, tools, and parts for servicing vehicles, as well as the skill of the individual doing the work. Because of the vast number of vehicle applications and potential uses of the aligner, the manufacturer cannot possibly anticipate or provide advice or safety messages to cover every situation. It is the automotive technician's responsibility to be knowledgeable of the vehicle to be aligned. It is essential to use proper servicing methods and perform wheel alignments in an appropriate and acceptable manner that does not endanger

operator safety, the safety of others in the work area, the equipment or vehicle being serviced.

Read this manual carefully before powering up the equipment. Conserve this manual and all illustrative material supplied with the equipment in a folder near the equipment where it is readily accessible for consolation by the operator.

The technical documentation supplied is considered an integral part of the equipment; in the event of sale all relative documentation must remain with the system.

This manual is only being considered valid for the equipment of the model and with the serial number indicated on the nameplate applied to it. The nameplate is attached to the back of the cabinet.

## WARNING !

Without prior knowledge to the manufacture or manufacture authorized dealers, any alterations to this aligner may cause serious injury. The manufacture is not responsible for any injury caused by improper use, abuse, or unauthorized repair.

# II. Getting Started

## 2.1 Equipment transport conditions

The aligner must be shipped in its original packing and stowed in the position indicated on the outside.

| |
|---|
| To avoid damage, never place other items on top of the packaging. |

Handling of the aligner must be performed only with an appropriate lifting device such as a forklift or pallet jack.
Only personnel who are experienced and qualified on material handling procedures should handle any transportation or moving of the aligner.
Inspect for any damage to the crate and notify local distributor (and/or transport company) immediately if any damage is observed.

### Uncrating Instructions:

Carefully remove the crating and packing materials and all skid and pallet fasteners. Be careful when cutting banding material as items may become loose and fall causing personal harm or injury. Always wear gloves when uncrating the machine to prevent scratches, abrasions, or cuts due to the contact with packing materials. Retain all packaging in the event you need to return any parts for warranty or servicing. Carefully unpack and inventory all items. Familiarize yourself with all components before beginning set up and assembly.

# 2.2 Equipment and Servicing

## 1. Check List

Standard Configuration：

| | |
|---|---|
| Computer | 1 |
| Post | 1 |
| Monitor | 1 |
| Cabinet | 1 |
| Software | 1 |
| Printer | 1 |
| Target | 1 set |

| | |
|---|---|
| Wheel Clamp | 4 |
| Wheel Stopper | 2 |
| Steering Wheel Holder | 1 |
| Brake Depressor | 1 |
| Manual | 1 |
| Power cord | 1 |

## Warning !

Please use the original accessories produced by manufacturer. The manufacturer is not liable for any damage or injury caused by improper use.

## 2. Camera Care

Keep hand and tools away from camera.
No grease on the lenses. Use neutral detergent with soft cloth to clean lenses if necessary. Do not use neutral detergent directly onto the lenses.

## 3. Target Care

Keep targets clean, handle with care

- Both hands should be clean when using target.
- Keep hands and tools away from surface of targets.
- Keep wheel clamp and target firmly attached, avoid drop of targets.
- No grease on the surface of targets, use designated cleaner and soft cloth to clean target. Do not use soft cloth from workshop.

Warning: When the aligner system cannot detect color line on the targets, clean the target with care first. When the targets are not in use, attach the target with clamp and store them on the cabinet. Do not put target face downward onto any surface.

Warning: Do not use water on the target and forbidden to use pressurized water to clean the target, or use detergent to clean directly. Improper use may break the target.

# III. Installation Guide

## 3.1 Installation Environment Check

### 3.1.1 Camera Beam Position

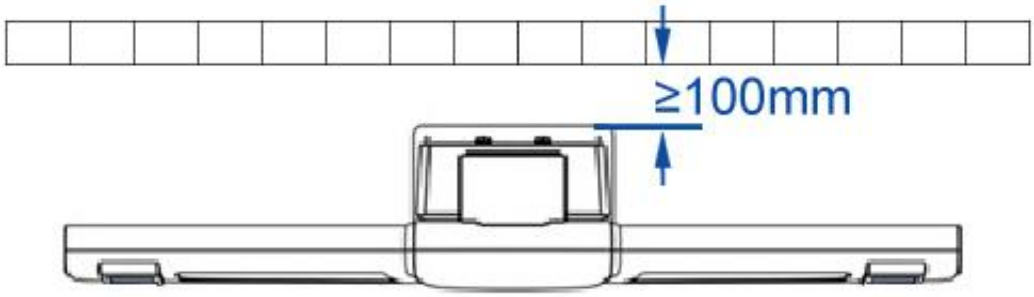



Diagram: Distance between post and wall

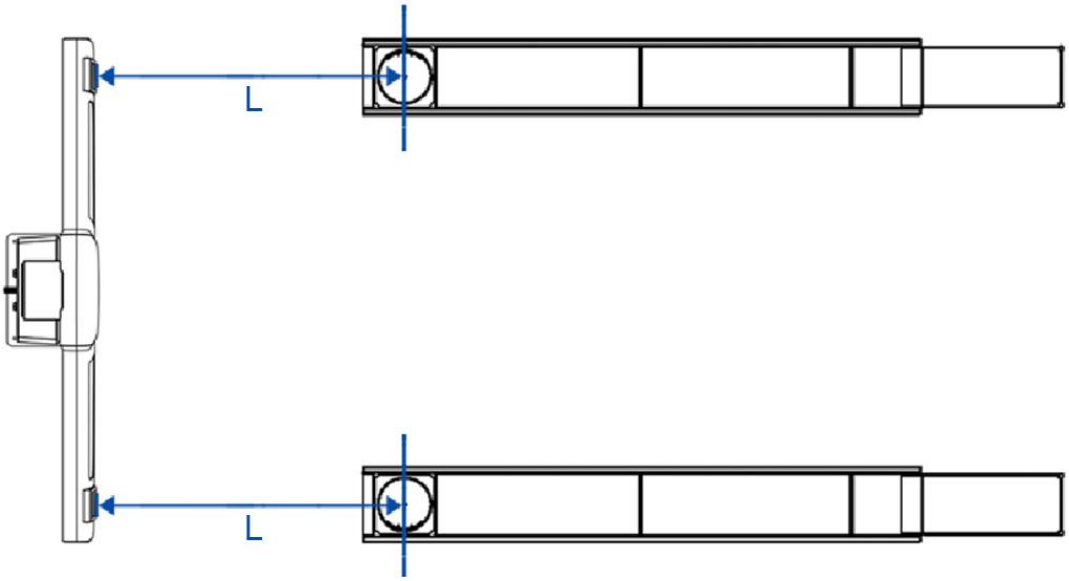



Diagram: Distance between cameras to center of turn table

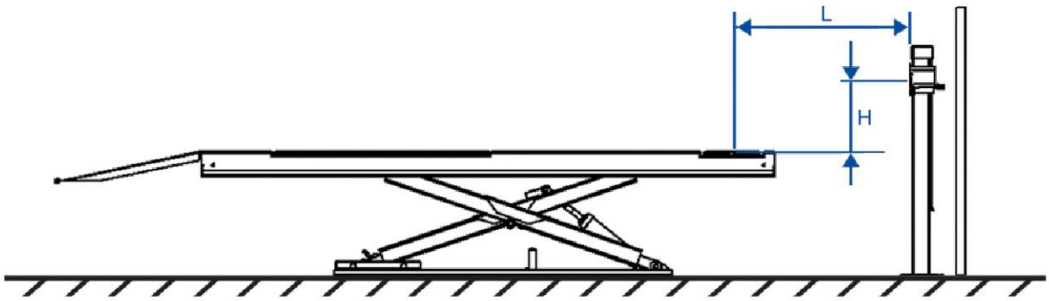



Diagram: Offset between Camera beam and turn table

| L | H |
|---|---|
| 1800 | 550 |
| 2000 | 550 |
| 2200 | 600 |
| 2500 | 600 |
| 2800 | 600 |

## 3.1.2 Lift Levelness

All eight measurement points has to be within 2 mm

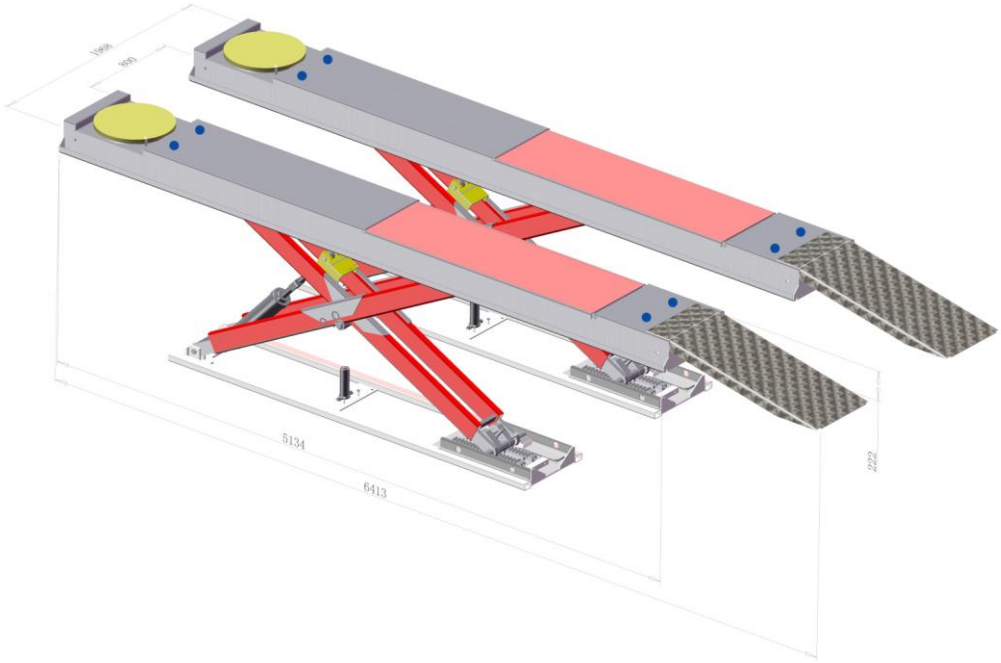



Diagram: Requirement for Lift Levelness

# 3.2 Positioning

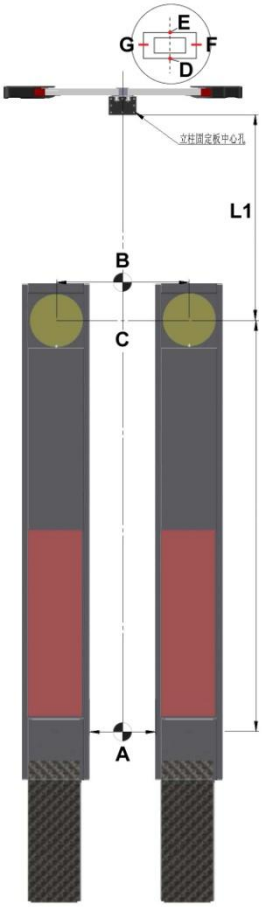


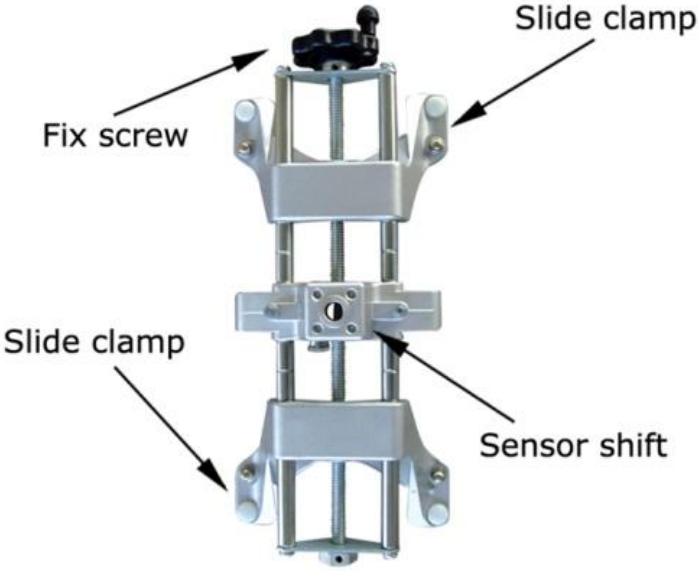

Diagram: Positioning

Measure the distance between two inner side of the runway of the lift and find its center point. Shown as A and B. Find the center line of the lift using those two points. With turn table locked, at the alignment level, find the center point of the turn table. Link the two center points of the turn table, as shown as C.

From the center line of the turn table, measure L1. Mark the first position of the post Mark the four point for the base of the post. Shown as E and D points.

# 3.3 Installing wheel clamps and target

## 3.3.1 Installing wheel clamps




Caution: Different wheel may have different clamping mechanism. Special fingers may be required when using high end wheel.
Only using universal wheel clamp to do run out compensation.

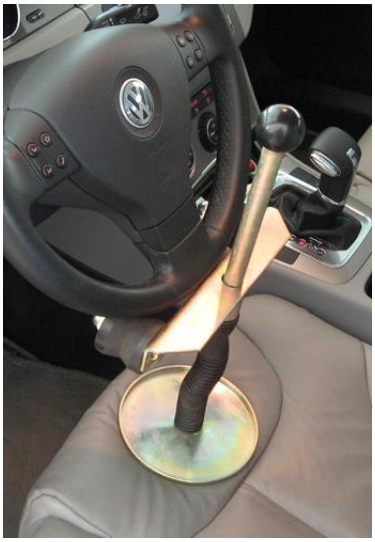
## 3.3.2 Fixing targets

Please check if the wheel clamp is firmly attached to wheel. Lightly lubricate the socket pins of the measurement board to protect the pin and socket. Please mount two small targets in the front and bigger one in the rear. Please keep the spirit level upside.

## 3.4 Installing/Removing brake depressor

Ensure properly installing brake depressor. Place a cloth underneath if necessary. After run out compensation, fit the brake clamp for further measurements.

## 3.5 Installing/Removing steering wheel holder.



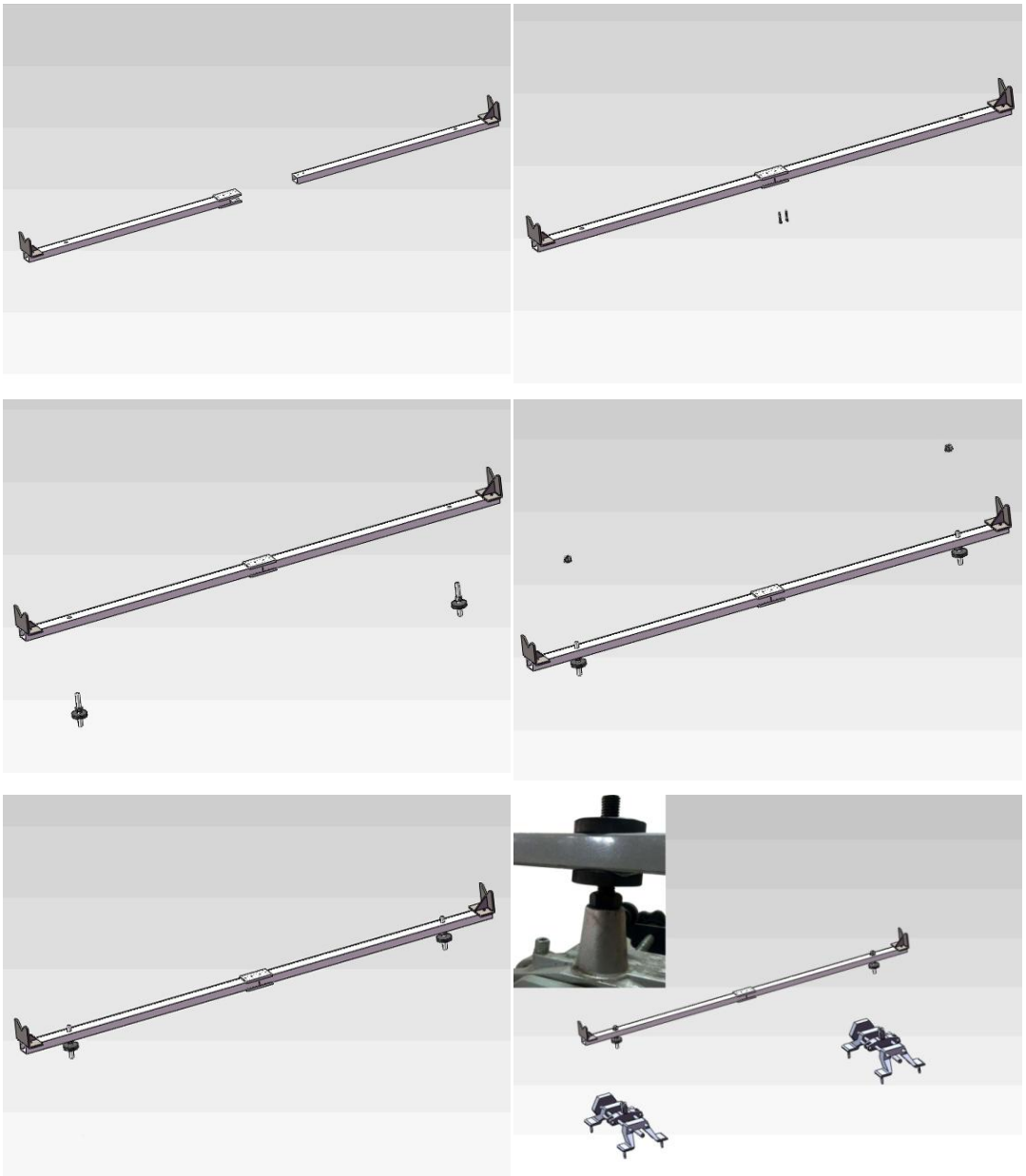
The steering wheel holder must hold the steering wheel in position and blocks the wheels.

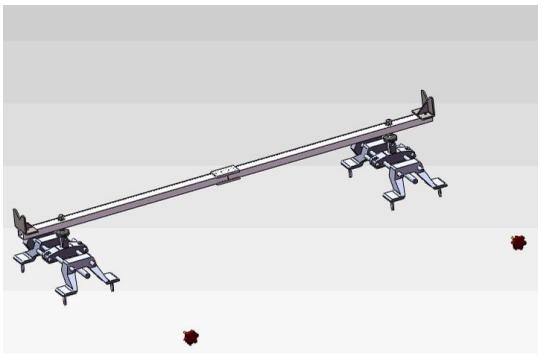
1. Place the steering wheel holder on the seat and press the plate against the seat.
2. Slide the arms downwards against the seat.
3. Release the holder so that pressure is exerted on the steering wheel by way of the seat cushion.
4. Remove in the reverse order.

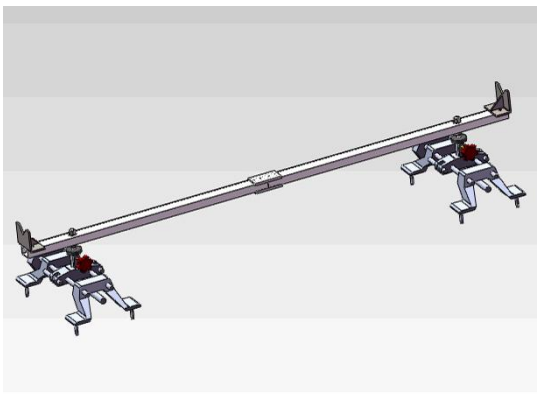
Ensure properly installing steering wheel holder. Place a cloth underneath if necessary. After run out compensation, fit the brake clamp for further measurements.

# 3.6 Assemble Calibration Kit

1. Connect two base support for calibration bar, use screw to lock them.
2. Place the base support for calibration bar to adjustable connection tool.
3. Place the base support bar to wheel clamps.
4. Install the knob to wheel clamp and fix them together.
5. Connect two-piece calibration rod together, make sure the screw is at the right position.
6. Install the knob to calibration rod.

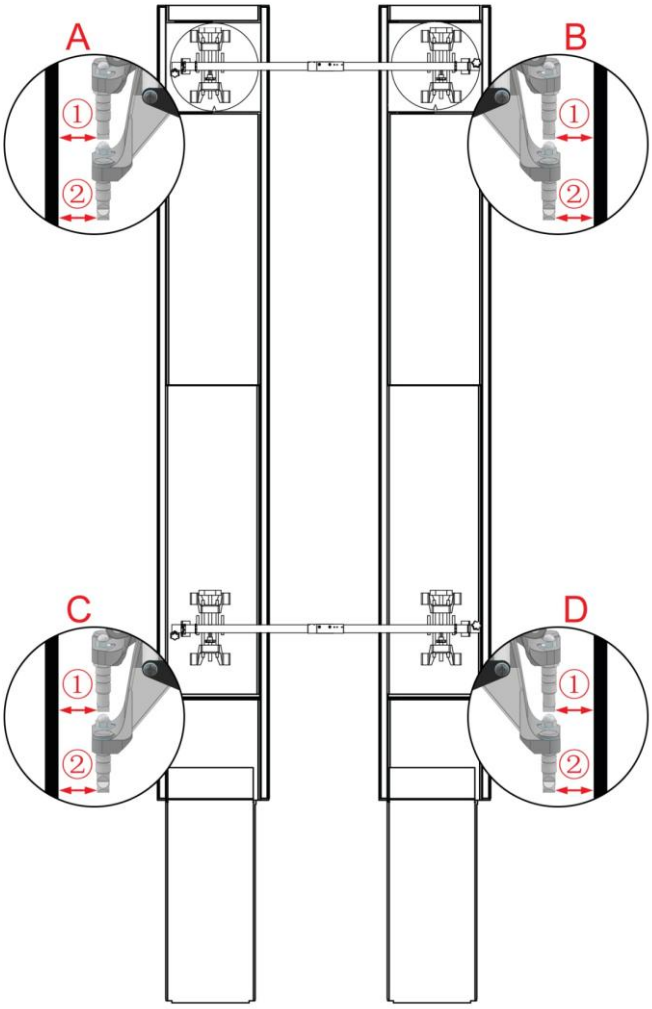


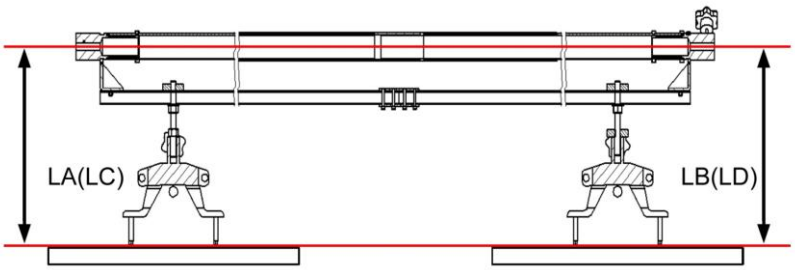




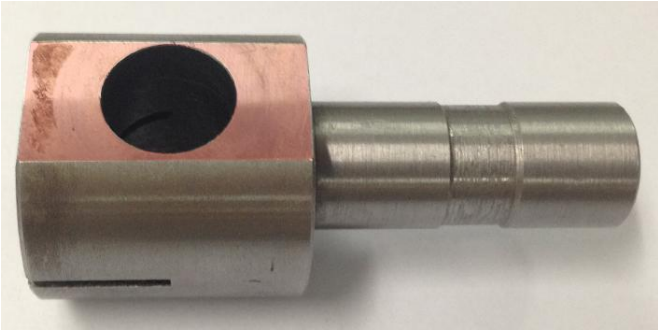
# 3.7 Placement of calibration fixture and targets

1. Place calibration fixture in front and rear position. A=B=C=D; LA=LB=LC=LD.

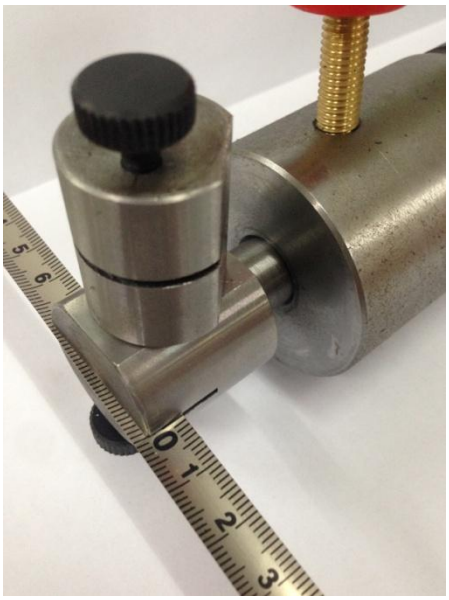



2. Place four right trangle tool to each hole of calibration bar.



3. Level the right triangle tool and lock them.



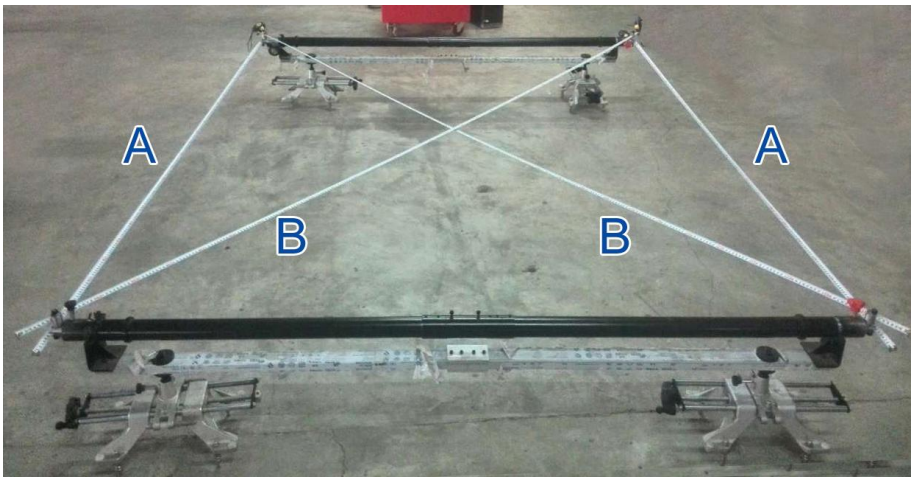
4. Put the 3m tape measurement in the right triangle tool and fixed one side at 100 mm.

5. Put two 3m long tape measurement in the right triangle tool from front to rear of the calibration fixture.
6. Adjust the calibration fixture until both side are equal.

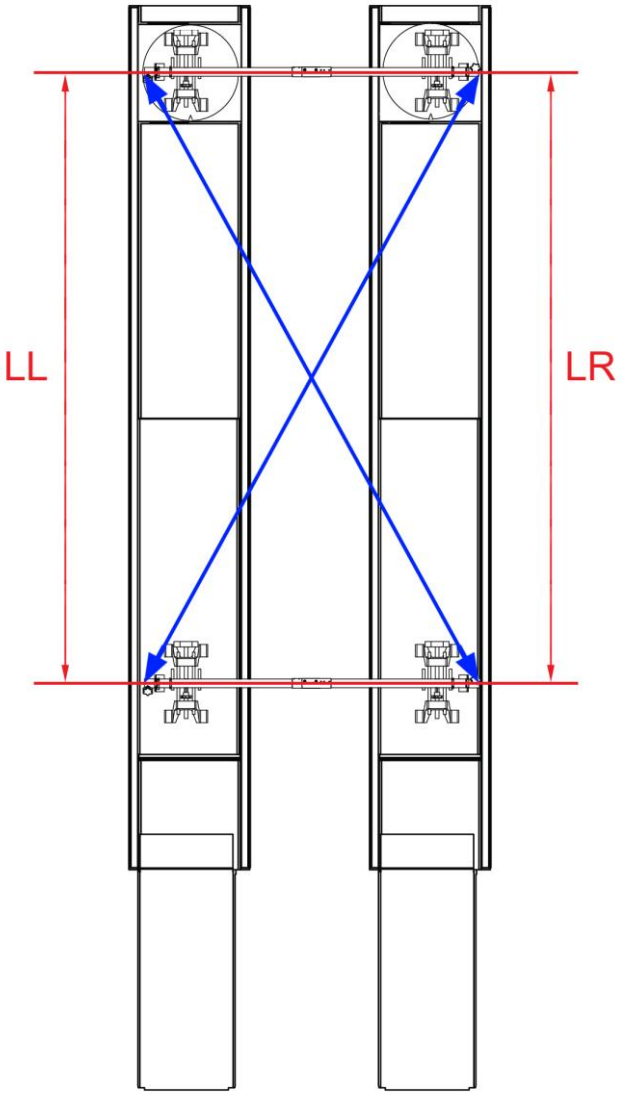
7. Put two 5m long tape measurement in upper right triangle tool and fix them at 100 mm.

8. Place two 5m tape measurement from front to rear calibration bar diagonally.
9. Adjust the calibration fixture so diagonally are equal.

10. Adjust until both A/A and B/B are equal.




| Wheelbase（Center） | Side（A） | Diagonal（B） |
|---|---|---|
| 2300 | 2270 | 2298 |
| 2400 | 2370 | 3073 |
| 2500 | 2470 | 3151 |
| 2600 | 2570 | 3231 |
| 2700 | 2670 | 3312 |
| 2800 | 2770 | 3391 |
| 2900 | 2870 | 3476 |
| 3000 | 2970 | 3557 |
| 3100 | 3070 | 3643 |


LL
LR

# IV. Software

## 4.1 Opening/Closing Alignment software

Switch on power supply and push the power button to start the computer. The computer should start the alignment software automatically. In case the alignment software does not start, click on the icon to start the alignment software.

If you do not see a shortcut for the alignment software, please make sure your alignment software is properly installed; contact your local service center if necessary.

## 4.2 Hot keys

Wheel aligner uses an IBM standard keyboard, there are 12 function keys from F1 to F12 located on the top of keyboard. There are also specific function keys located on the right side of keyboard, such as “Page Up”, “Page Down”, “Enter” “Home” and arrow direction keys. Instructions for these function keys will be mentioned in following sections and you will find their use very convenient.

F10 - Help

Version

PgUp - Previous

PgDn - Next

Home - Press HOME key under any screen to go back to software main menu screen

Warning: Please do NOT switch off power supply directly to shut down the computer. Switching off power directly may affect proper operation of the Microsoft Windows system.

Diagram: Main screen

Help

Previous

Next

Clear run out

ESC –Exit program

Version Info

Management

## 4.3 Visual Check

Click Or press F1 to enter visual check.

Diagram: Visual Check

Defective, replacement needed

Warning, repair needed

Normal, no action needed

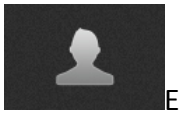
Next: Enter next screen

Print: Print check table or check report as desired

## 4.4 Standard Measurement

After visual check，click standard measurement to enter measurement screen. Or click or press F2.

Standard measurement: Select customer → Select vehicle manufacturer → Run out compensation → Caster Measurement → Rear Axle Measurement → Live Caster Adjustment → Front Axle Measurement → Print.

1. Select  Enter customer info. Click “new customer” and enter customer info.

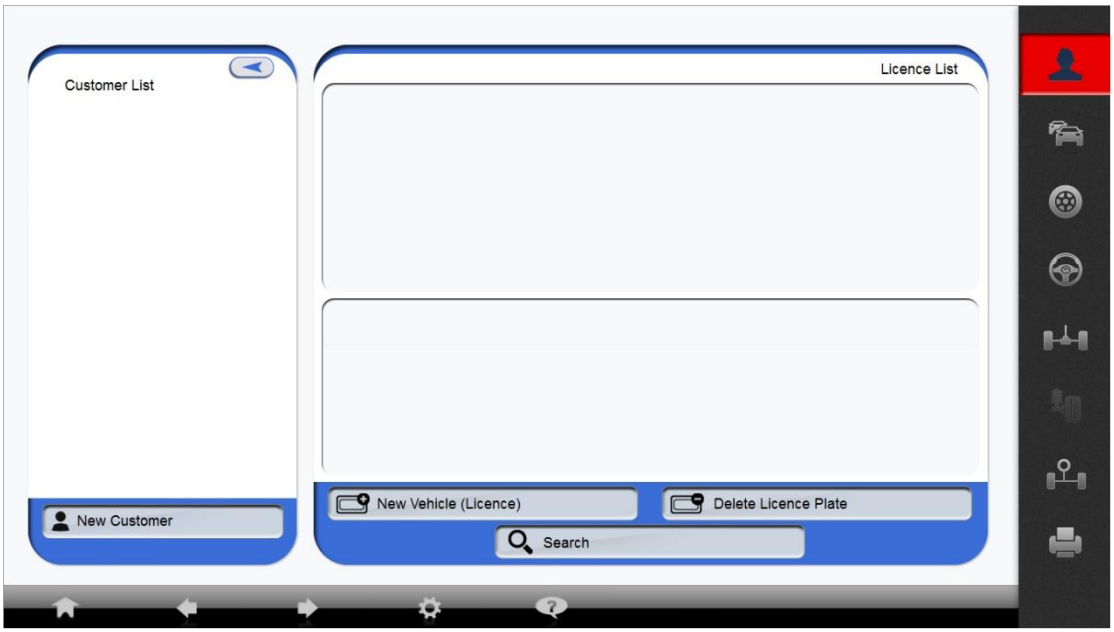



Diagram: Standard Measurement- Selecting customer

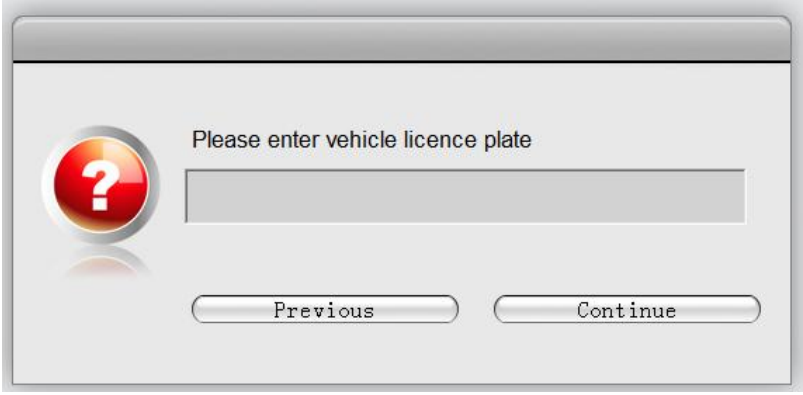
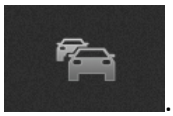



Diagram: Enter license plate number

2. Select vehicle model  . Select vehicle specification, Select vehicle manufacturer, year and model.

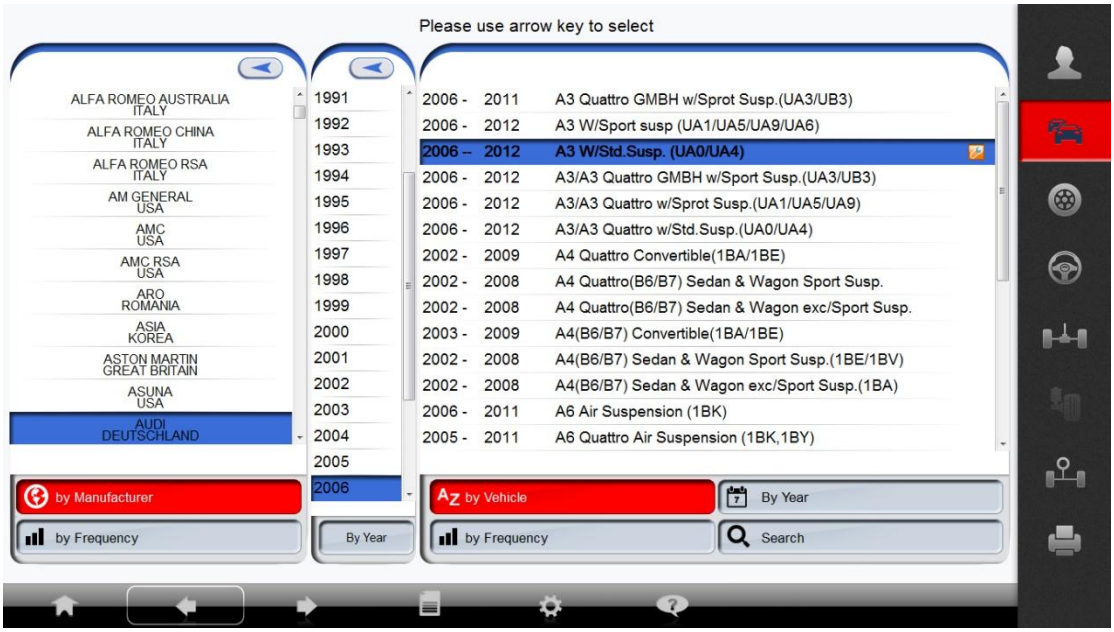



Diagram: Standard measurement- select vehicle model

Click next to enter manufacturer spec page.

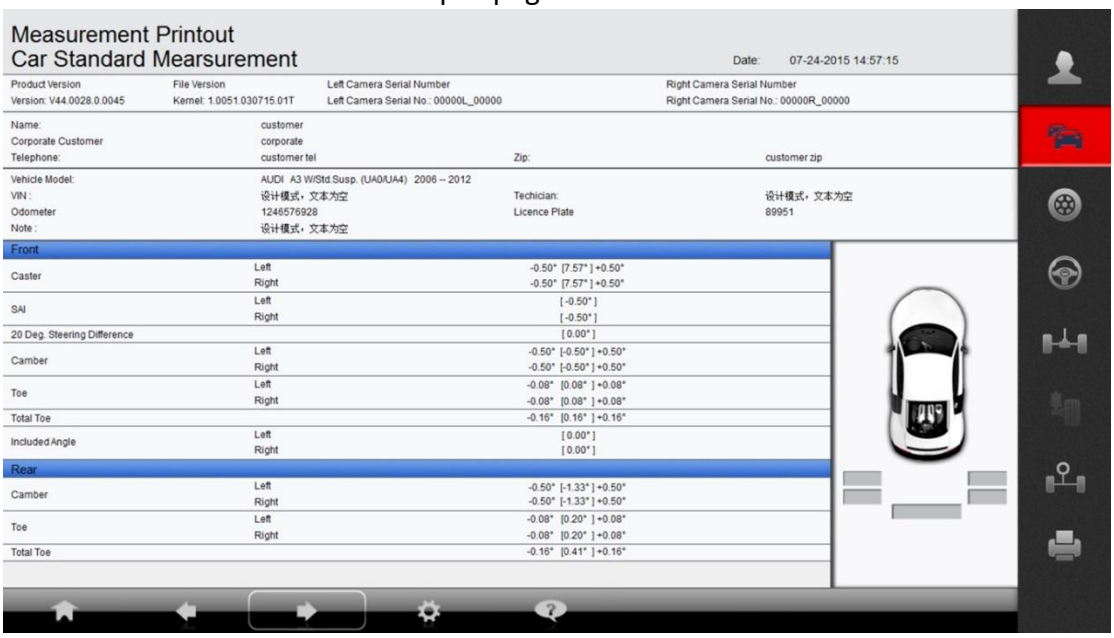
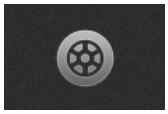



Diagram: Standard measurement – manufacturer spec

3. Click next or  to enter run out compensation.

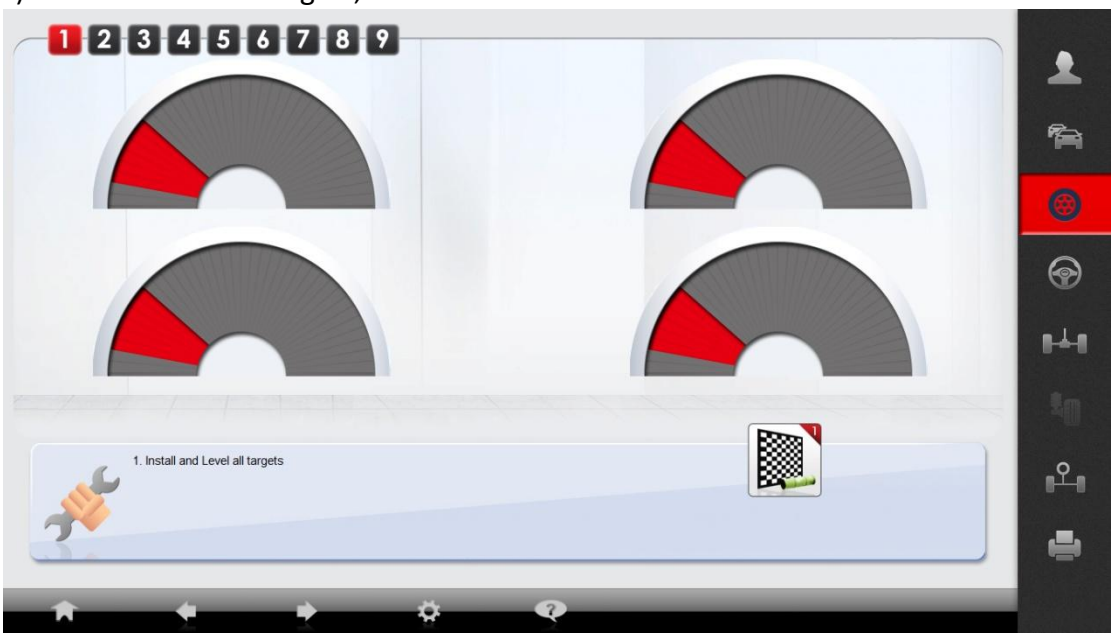
During the alignment process, run out compensation is very important. Without run out compensation may result in inaccurate alignment reading in toe and camber value.

Before enter next screen, please make sure both turn tables are locked and wheel stoppers are in place.

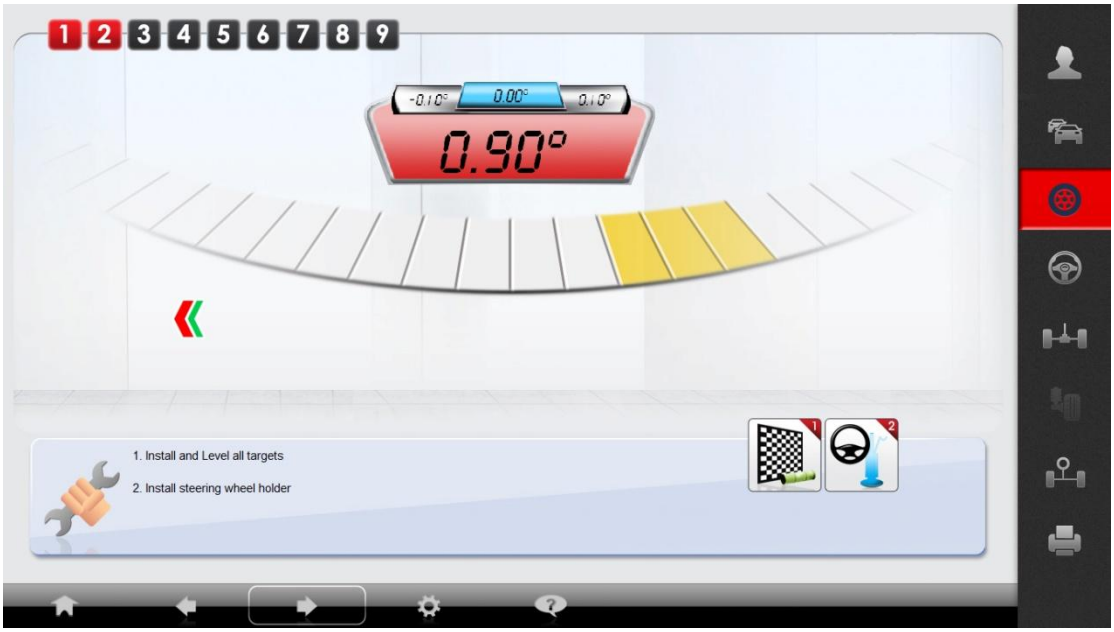
Before enter next screen, please place rear wheel stopper away from the tire, this distance may differ depending on the size of the tire.

Follow instructions indicated in the software：

1) Install and level targets,




2) Install steering wheel holder,



3) Release brake,

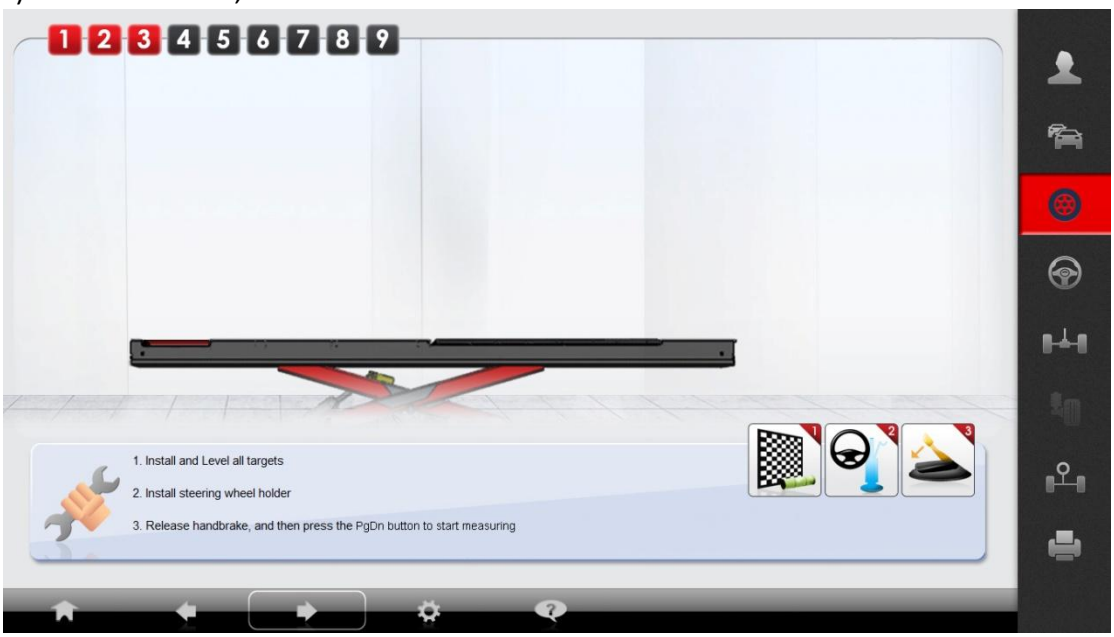



Diagram: Standard measurement- run out compensation

After the last 3 steps, click Next or PgDn to continue

Caution: Please note the top right corner may appears “STOP” sign. If it appears, please keep vehicles still. During the “STOP” sign shown on the screen, any movement may results in inaccurate alignment reading.

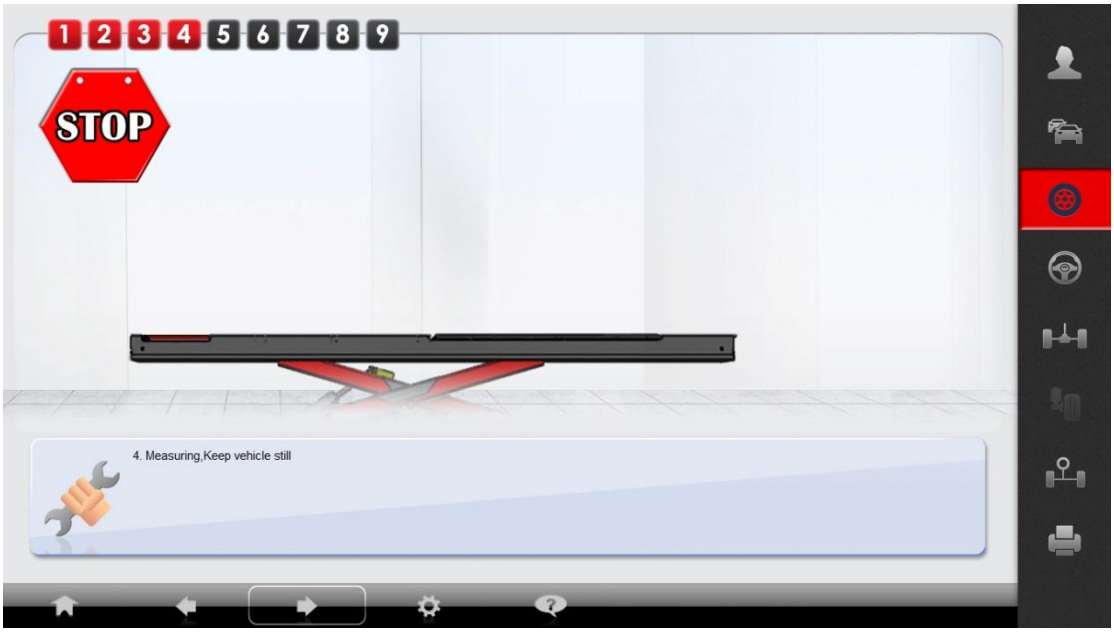



Diagram: Standard Measurement: Run out compensation

After first measurement, Push vehicle backwards 40 degrees, till the process is 100% finished, software display “STOP” to guide the operator stop.

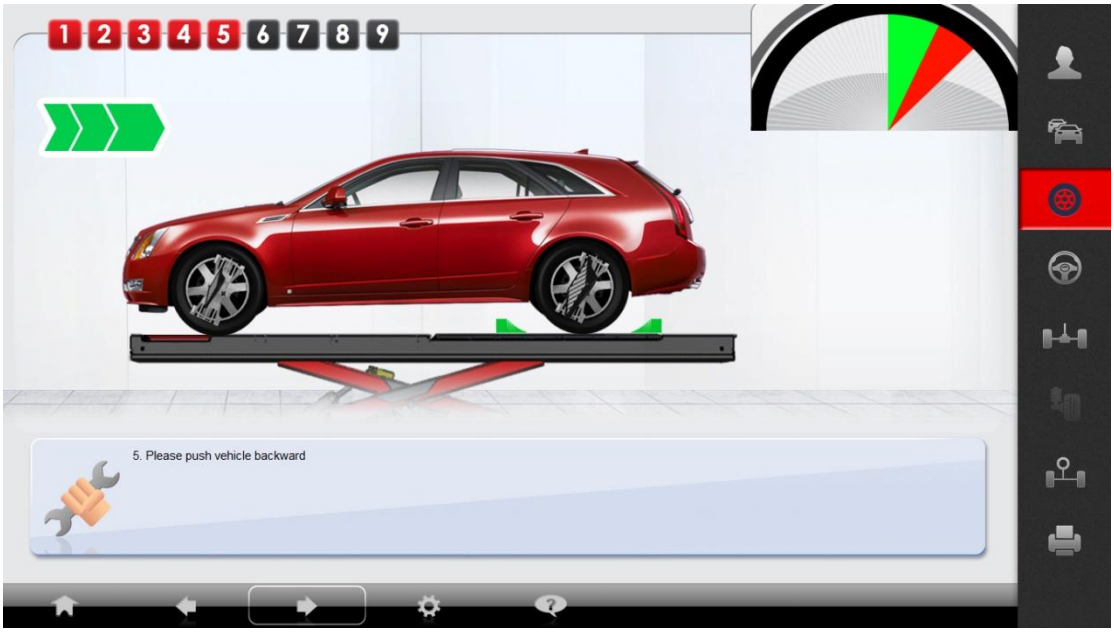



Diagram: Standard Measurement: Run out compensation

Once the bar is fully green, software reads 2nd value.

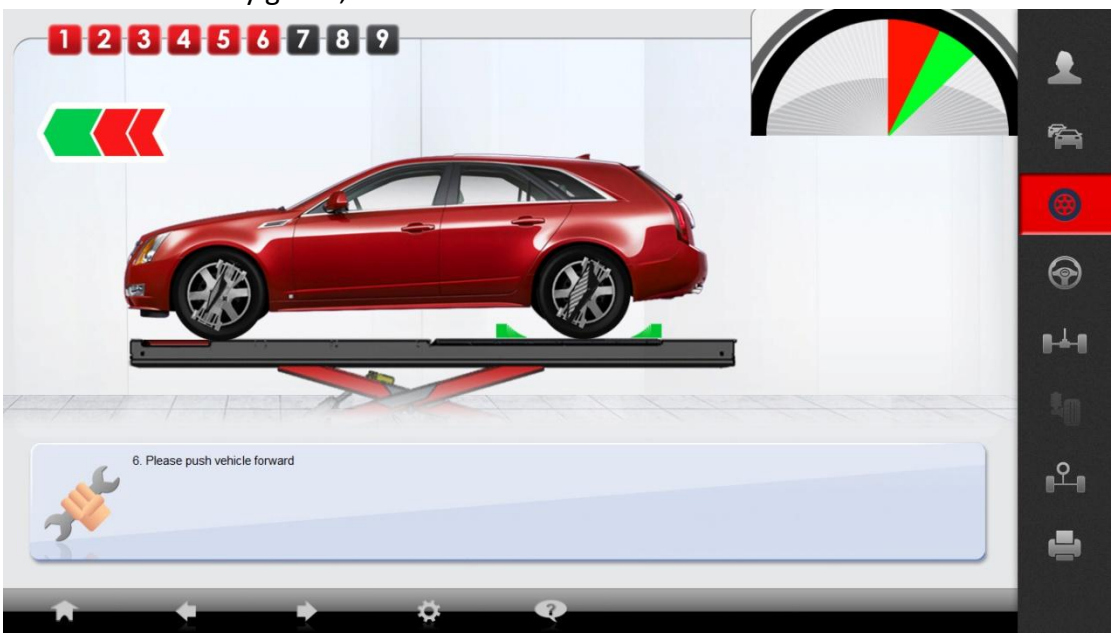



Diagram: Standard Measurement: Run out compensation

Push forward, push vehicle back to its original position until the progress bar is green.

Caution: Because one of the wheel stopper is at its original position, vehicle should stop at very close to 0 position. Move wheel stopper if needed.

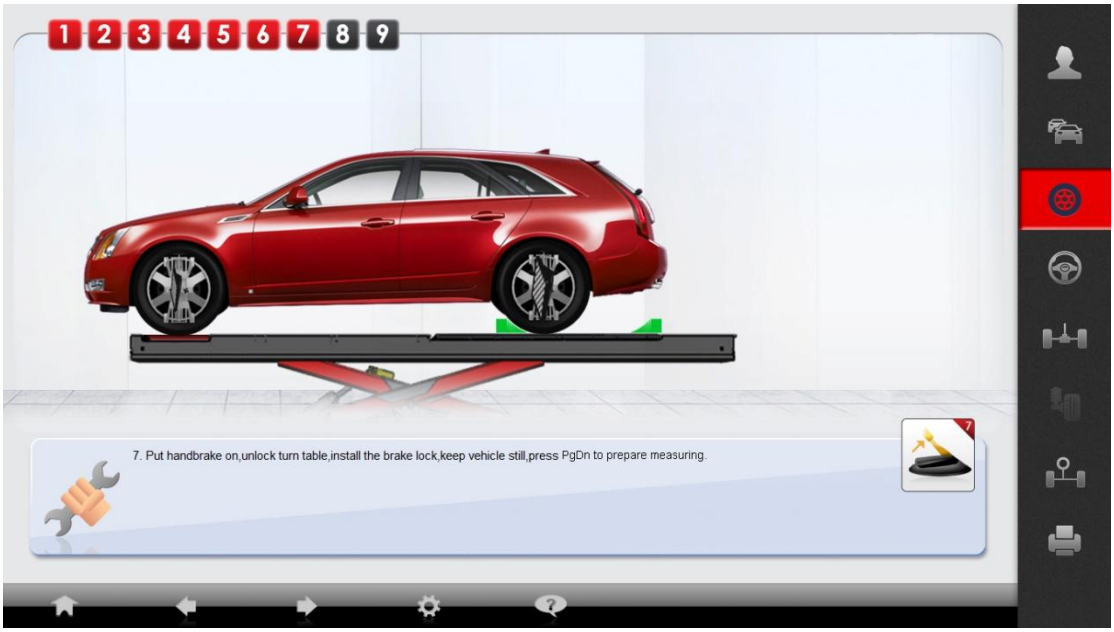



Diagram: Standard Measurement: Run out compensation

Push vehicle back to original 0 position, unlock turn tables and click next for next step.

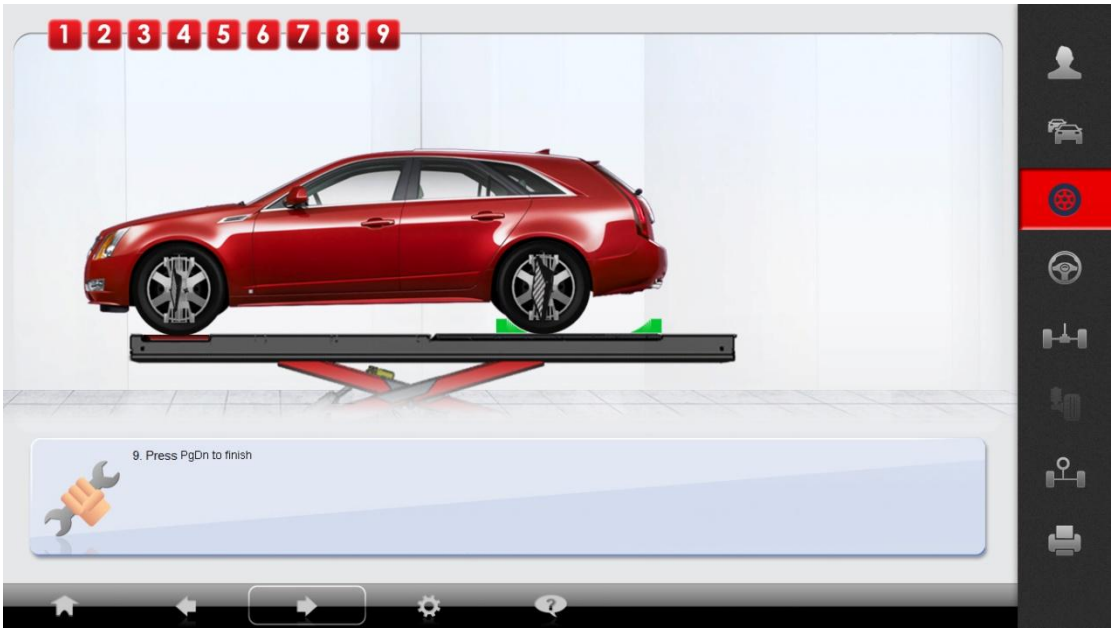
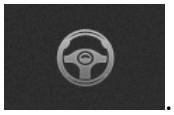



Diagram: Standard Measurement: Run out compensation

Click next to finish run out compensation.

4. Caster measurement  .

| |
|---|
| Caution: Caster measurement is disabled before full run out compensation is completed |

Option of 10 or 20 degree can be select in settings.

Enter caster measurement screen, software initializing. Centering steering wheel first and then follow instruction to turn steering wheel. After center steering wheel, screen will confirm and start caster measurement.

Diagram: Standard measurement - Caster

Diagram: Standard measurement - Caster

Turn steering wheel left 10 or 20 degree (depending on settings) until screen shows “stop”. Keep steering wheel still until the 10 or 20 degree with red background change to OK in green background.

Diagram: Standard measurement - Caster

Turn wheel to right 10 or 20 degree until screen shows stop, follow the same procedure as previously indicated.

Diagram: Standard measurement - Caster

Diagram: Standard measurement - Caster

Center steering wheel after taking 10 or 20 degree at both side.

5. Rear Axle

After caster measurement, software enters rear axle reading automatically. Follow the instruction and physically centering the steering wheel.

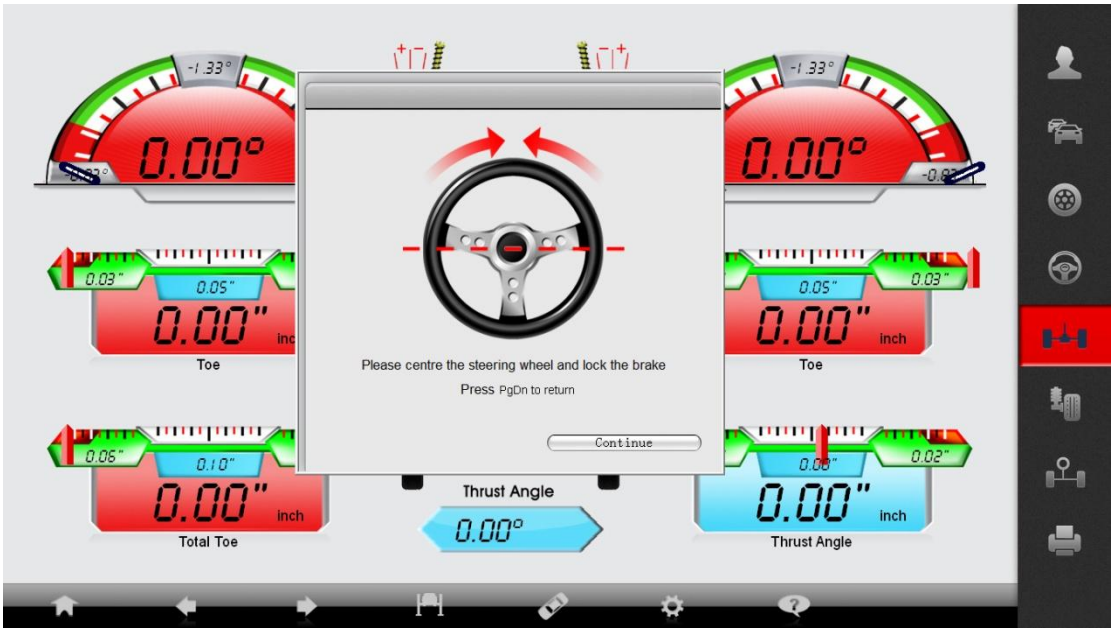



Diagram: Standard measurement – Rear Axle

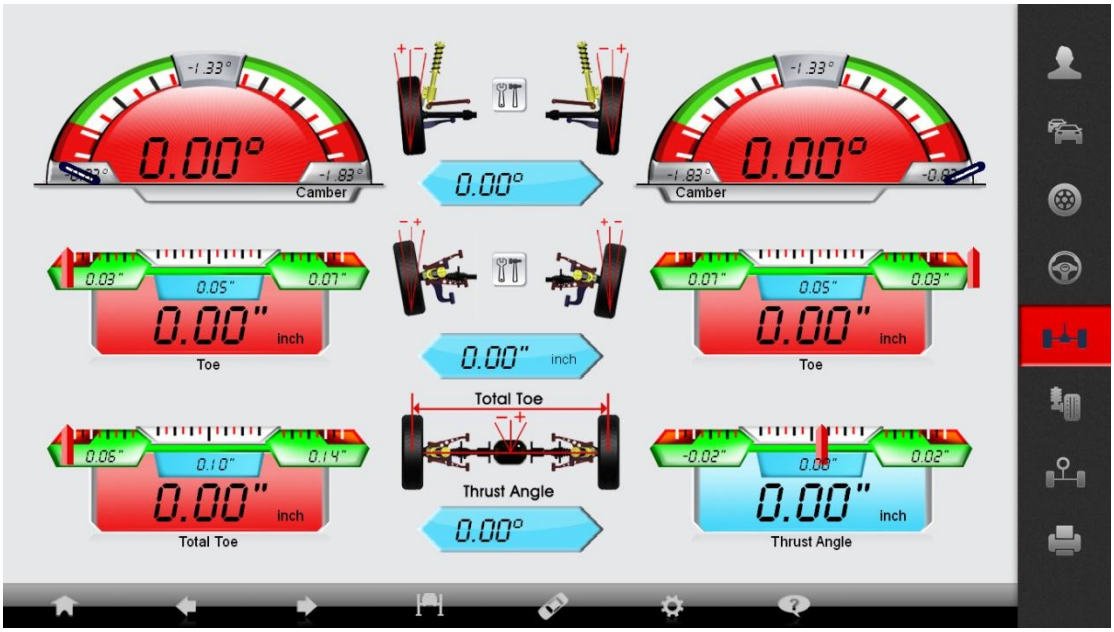
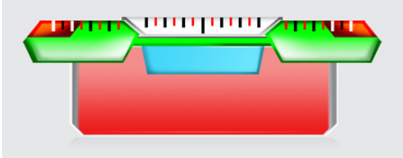
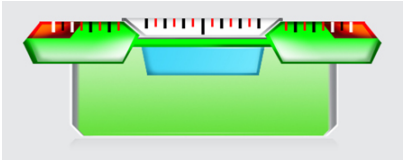



Diagram: Standard measurement – Rear Axle

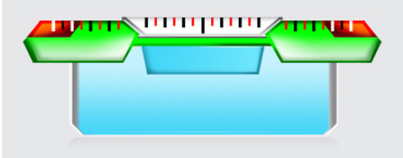
Rear axle screen displays rear camber, individual toe, total toe and thrust angle. All meters have manufacturer spec and tolerance. It displayed in order of minimum acceptable value, manufacturer value and maximum acceptable value. The background of meter indicates the value in acceptable range or not.



Red background indicates out of tolerance



Green background indicates within acceptable tolerance



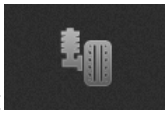
Blue background indicates close to manufacture value

When the reading is out of manufacturer tolerance, the wheel beside the meter indicate the direction of the wheel that is out of tolerance.

Zoom in：Double click live reading value can zoom in or use arrow key on the keyboard and click enter to zoom in

Illustration diagram: Indicates a illustration diagram is available.

Raised mode: Raising the vehicle and lock camber value

6. Live caster adjustment 

After rear axle reading, enter live caster adjustment screen.

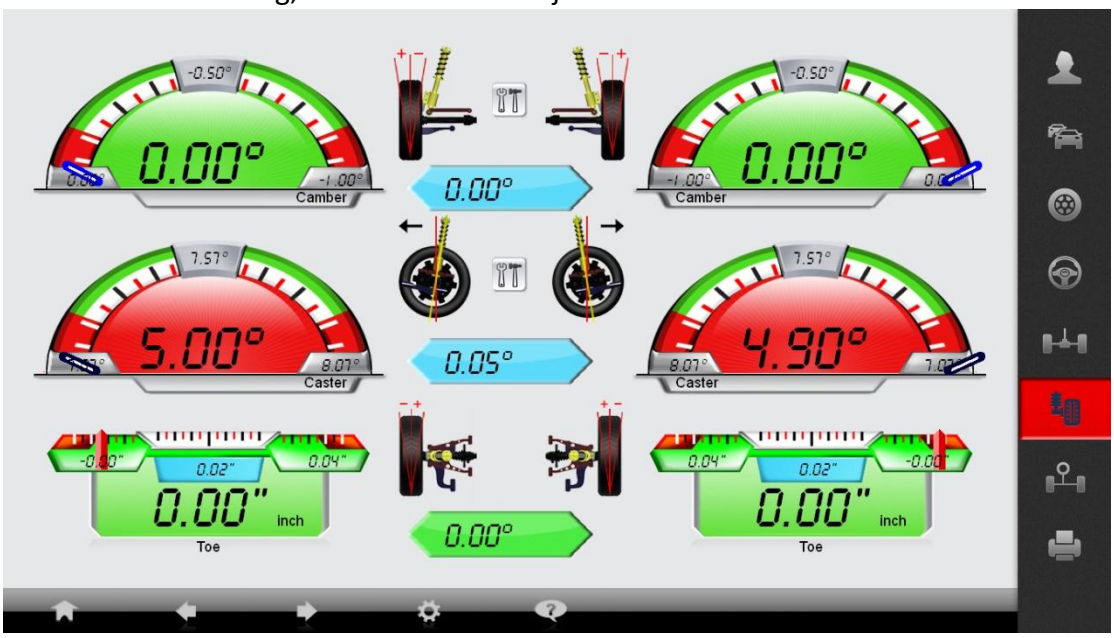



Diagram: Standard measurement – Live Caster

Live caster display: Camber, Caster and toe.

Note that live caster function is an estimated value of caster.

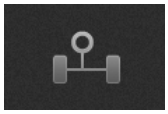
7. Front Axle 

Diagram: Standard measurement – Front Axle

Front axle displays: Camber, individual toe, total toe and setback.

Toe+: Toe adjustment

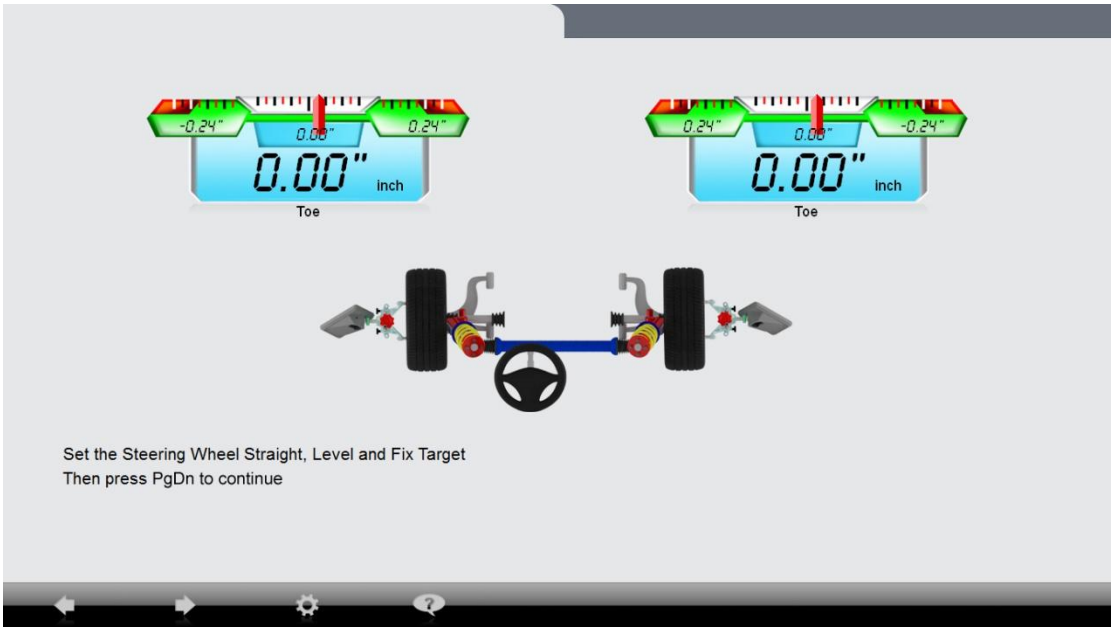



Diagram : Toe+

Enter super toe screen. The screen will instruct you to turn steering wheel straight ahead. Level and lock targets. Press Page Dn.

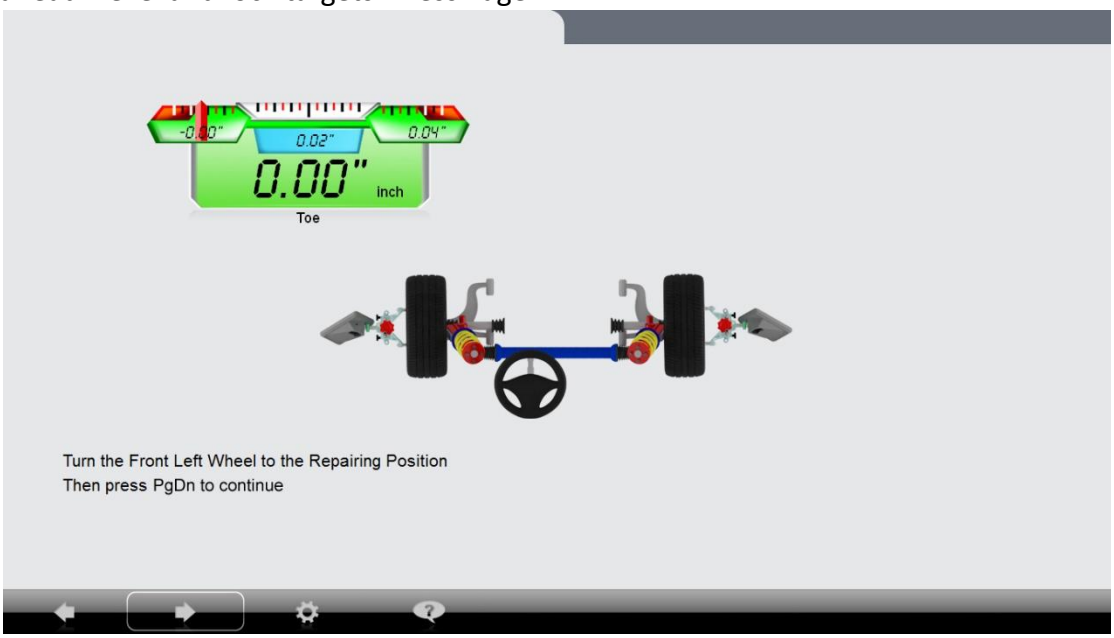



Diagram: Toe+

Turn steering wheel to left repairing position, level the target and follow instruction on the screen.

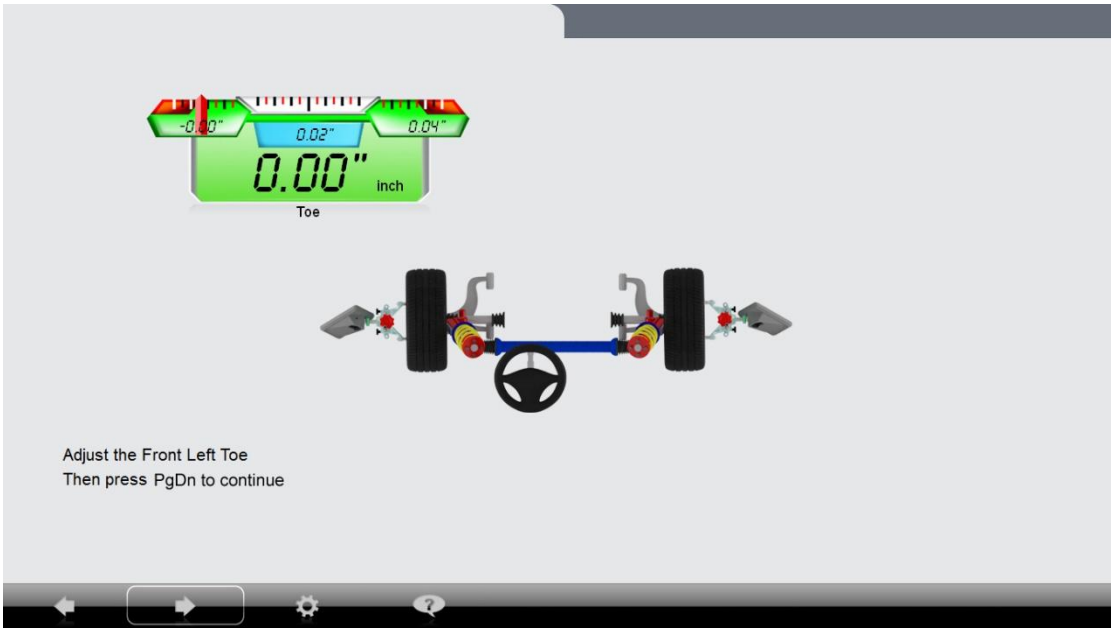



Diagram: Toe+

Adjust left toe.

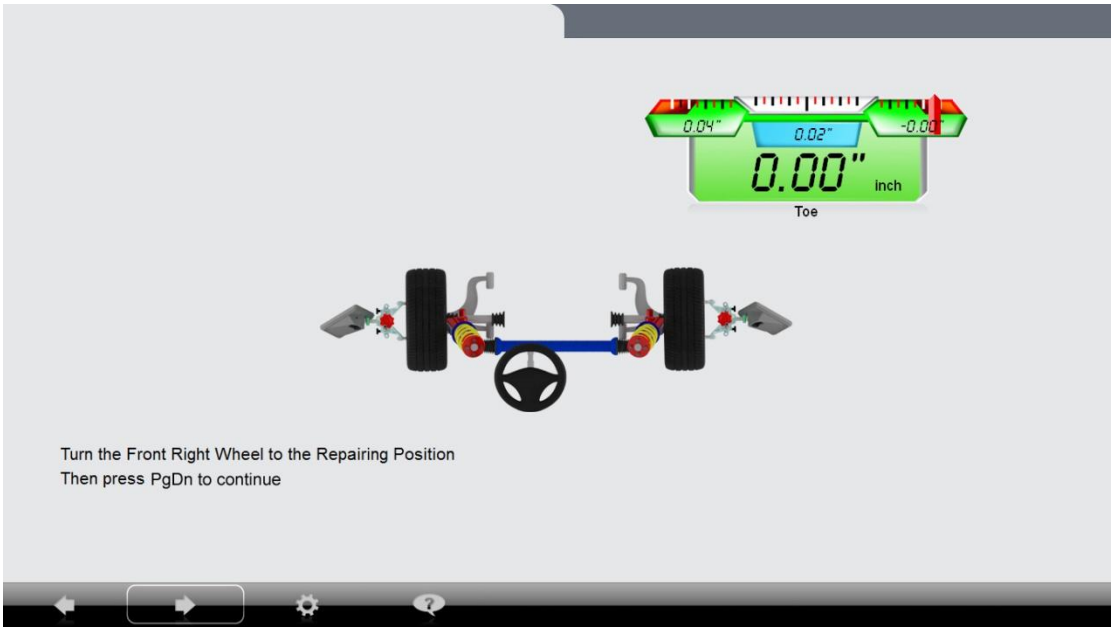



Diagram: Toe+

Turn steering wheel right to repairing position and follow instruction on screen.

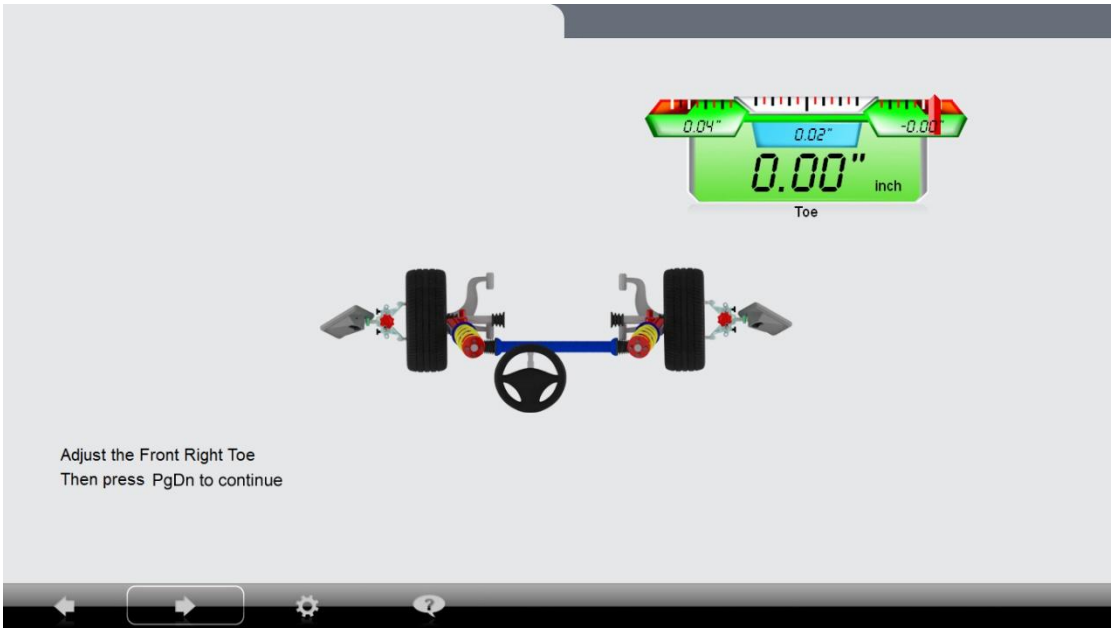



Diagram: Toe+

After the measurement, software gets required data and compare its data to manufacturer data, adjust the value to green or blue.

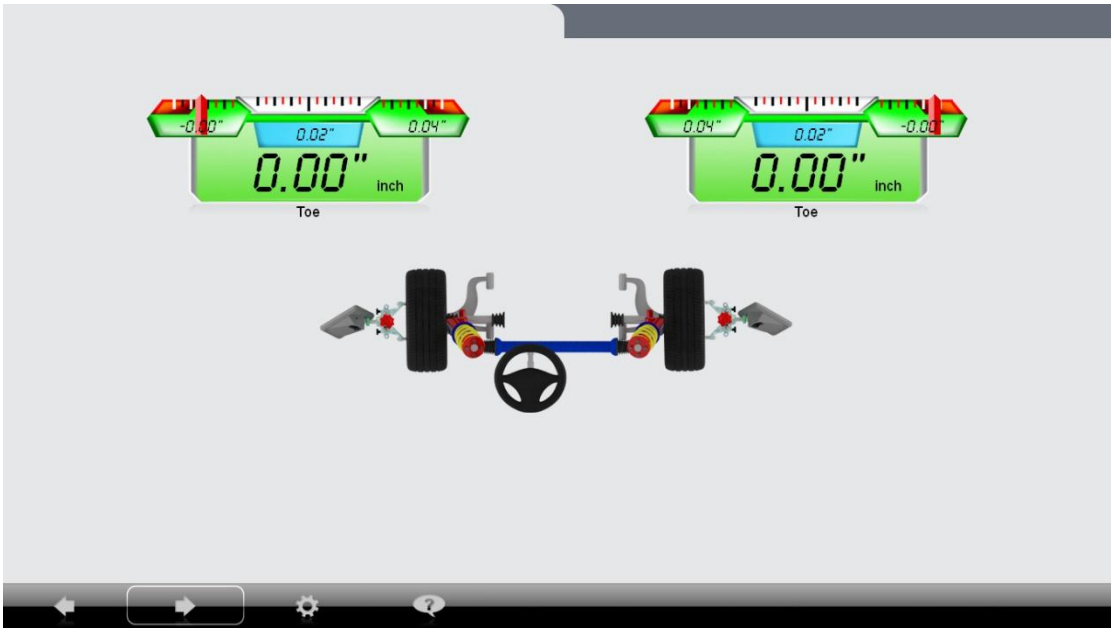



Diagram: Toe+

Toe Curve: VAG adjustment

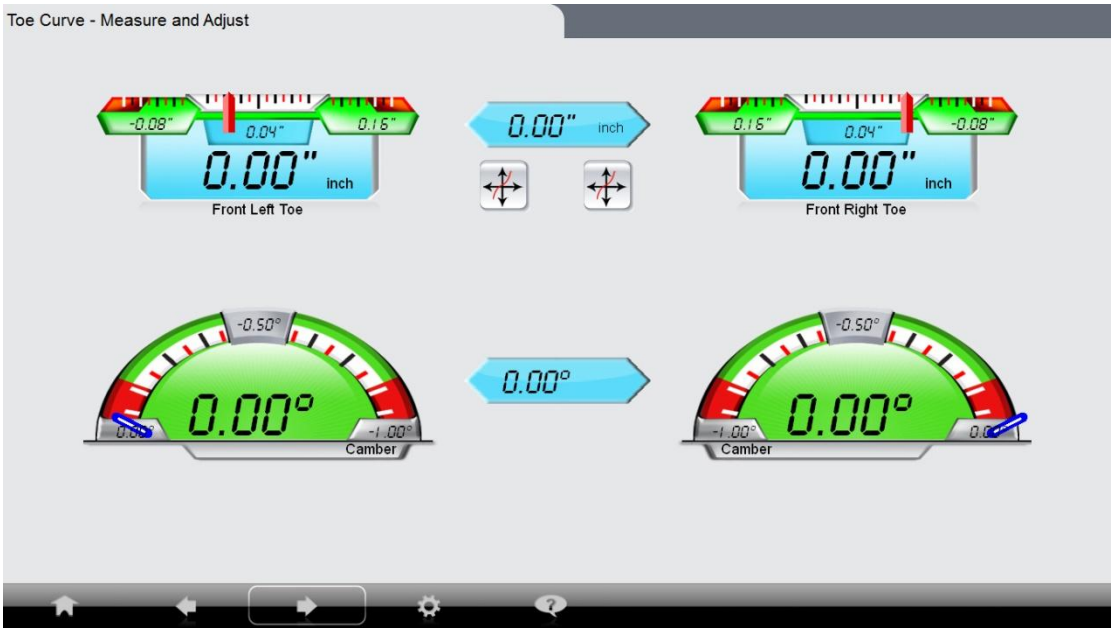



Diagram: Toe Curve

8. Print

Measurement Printout
Car Standard Mearsurement

Date: 07-24-2015 15:05:59

| | | | |
|---|---|---|---|
| Product Version | File Version | Left Camera Serial Number | Right Camera Serial Number |
| Version: V44.0028.0.0045 | Kernel: 1.0051.030715.01T | Left Camera Serial No.: 00000L_00000 | Right Camera Serial No.: 00000R_00000 |

| | | | |
|---|---|---|---|
| Name: | customer | | |
| Corporate Customer | corporate | | |
| Telephone: | customer tel | Zip: | customer zip |

| | | | |
|---|---|---|---|
| Vehicle Model: | AUDI A3 W/Std.Susp. (UA0/UA4) 2006 -- 2012 | | |
| VIN : | 设计模式，文本为空 | Techician: | 设计模式，文本为空 |
| Odometer | 1246576928 | Licence Plate | 89951 |
| Note : | 设计模式，文本为空 | | |

Before Adjustment | Manufacturer's Data | After Adjustment

| Front | Left | Right | Left | Right | Left | Right |
|---|---|---|---|---|---|---|
| Caster | 5.00° | 5.00° | -0.50° [7.57°] +0.50° | -0.50° [7.57°] +0.50° | 5.00° | 5.00° |
| SAI | 2.00° | 2.00° | | --.-- | 2.00° | 2.00° |
| 20 Deg. Steering Difference | | | [0.00°] | | | |
| Camber | 0.00° | 0.00° | -0.50° [-0.50°] +0.50° | -0.50° [-0.50°] +0.50° | 0.00° | 0.00° |
| Toe | 0.00° | 0.00° | - 0.02° [ 0.02° ] + 0.02° | - 0.02° [ 0.02° ] + 0.02° | 0.00° | 0.00° |
| Total Toe | 0.00° | | - 0.04° [ 0.04° ] + 0.04° | | 0.00° | |
| Set Back | 0.00° | | | | 0.00° | |
| Included Angle | 2.00° | 2.00° | [0.00°] | [0.00°] | 2.00° | 2.00° |

| Rear | Left | Right | Left | Right | Left | Right |
|---|---|---|---|---|---|---|
| Camber | 0.00° | 0.00° | -0.50° [-1.33°] +0.50° | -0.50° [-1.33°] +0.50° | 0.00° | 0.00° |
| Toe | 0.00° | 0.00° | - 0.02° [ 0.05° ] + 0.02° | - 0.02° [ 0.05° ] + 0.02° | 0.00° | 0.00° |
| Total Toe | 0.00° | | - 0.04° [ 0.10° ] + 0.04° | | 0.00° | |
| Set Back | 0.00° | | | | 0.00° | |
| Thrust | 0.00° | | | | 0.00° | |

Diagram: Standard measurement - result

The result page display all measurement values, red means out of range, black indicates normal. The left side is before adjustment value, center is manufacturer value and right side is after adjustment value.

Print: Prints a report with all info acquired and customer info

Manufacturer Value: enter manufacture spec page

Compare: compare values with previously measurement report

## 4.5 Quick Measurement

From main screen, click or F3 to enter quick measurement

Quick measurement：Select vehicle → Run out compensation → Front/Rear Axle → Print.

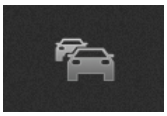
1. Select vehicle 

Diagram: Quick Measurement – Select vehicle manufacturer, year and model

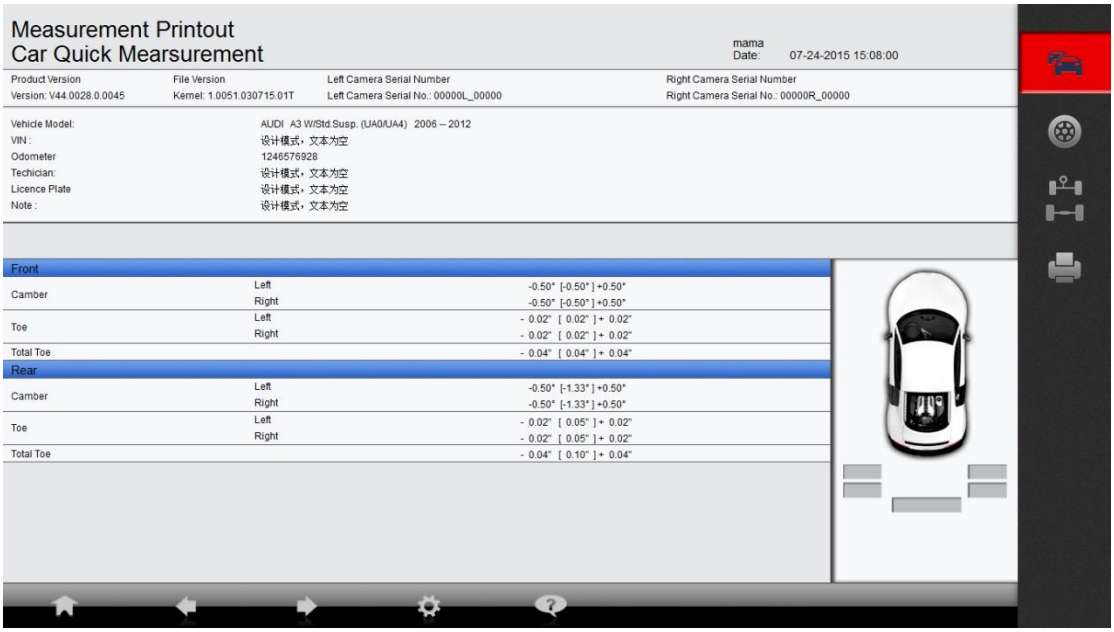
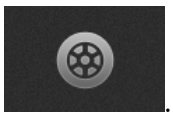



Diagram: Quick Measurement – Manufacturer spec

2. Run out compensation  .

After selecting vehicle spec, do run out compensation and follow instruction indicated.

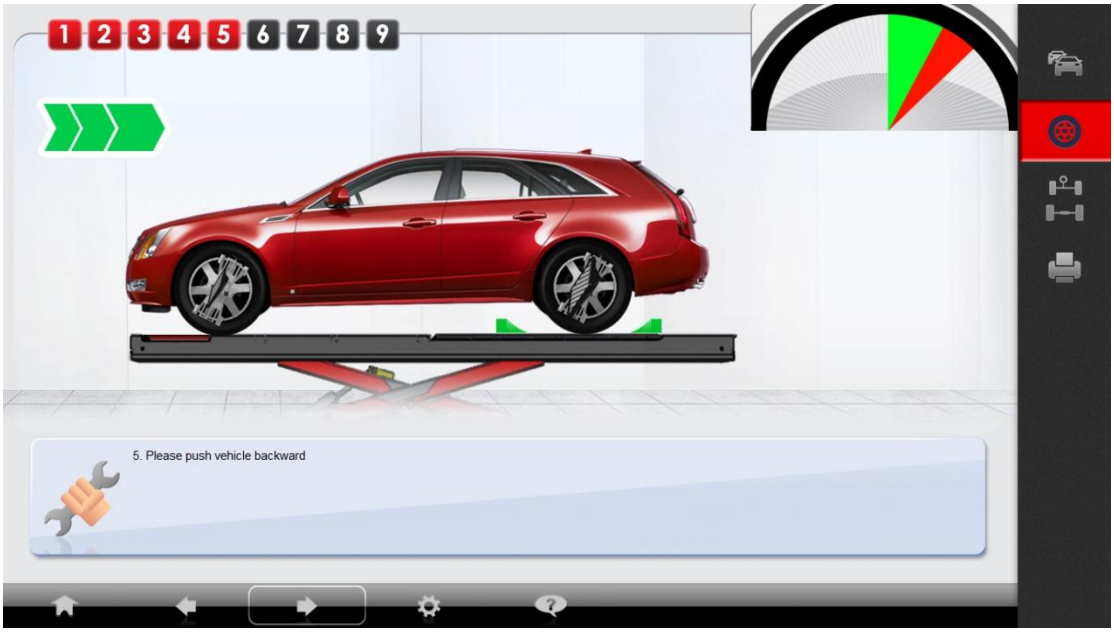
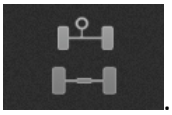



Diagram: Quick Measurement – run out compensation

3. Front/Rear Axle  .

| |
|---|
| Caution: Front/Rear Axle screen is disabled before doing complete run out compensation. |

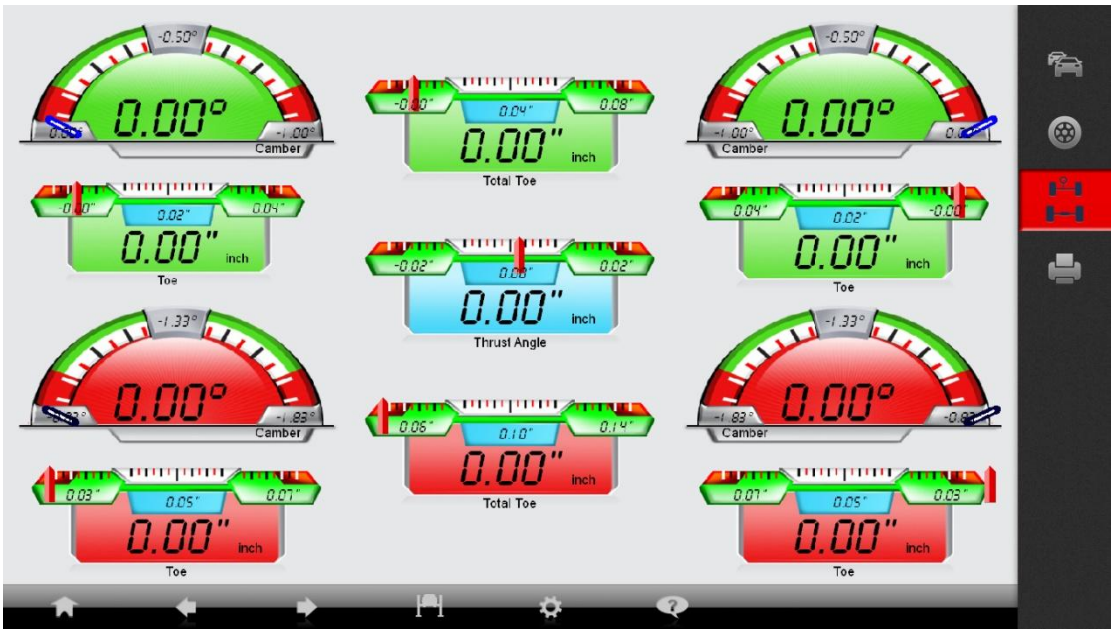



Diagram: Quick Measurement –Front / Real Axle

Front/Rear Axle screen displays front and rear camber, front and rear toe, front and rear total toe and thrust angle.

4. Print .

Diagram: Quick Measurement –Print

# 4.6 Aligner Management

From main screen, click or press F5 on keyboard to aligner management. Using this screen to access version number, settings, maintenances, customer information and database management.

Diagram: Aligner Management

- Click icon or press F1 to display software versions.
- Click icon or press F2 to changes aligner settings

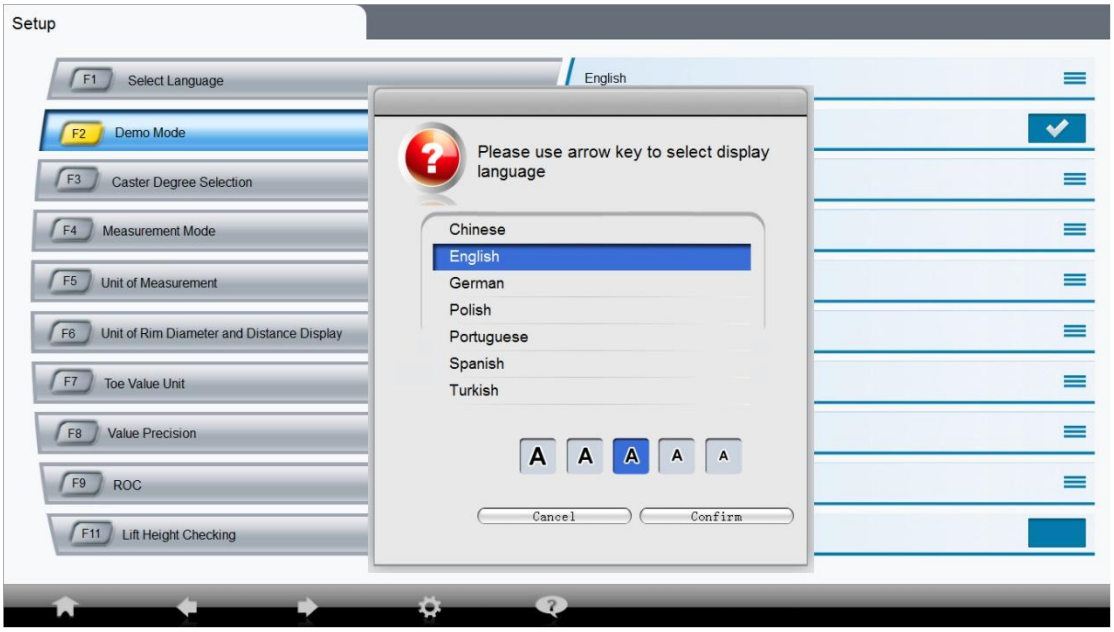



Diagram: Aligner setting with selection of display language

Settings：

F1：Language: Use “PgDn” to confirm.

F2：Demo mode: Software displays each screen without connecting cameras. In demo mode, use

Ctrl+left arrow key to demo vehicle moving forward and turning steering left or Ctrl+right arrow for vehicle moving backward or turning steering right.

F3：Caster Sweep: 10 or 20 degree.

F4：Measurement Mode：Four wheel or two wheel mode.

F5：Unit of measurement：Choose 1/60 degree or 1/100 degree.

F6: Unit of rim diameter and distance display: choose mm or inch.

F7：Toe value unit：choose degree、inch or mm.

If select mmm or inch as toe unit, enter tire diameter before measurement.

F8：Value precision：choose 0.01, 0.05 or 0.1, rounding of measurement result.

- Click

or F3 enter maintenance screen

Enter password “muenster”。

In this screen, calibrate aligner as target calibration, camera frame calibration, lift level calibration and thrust angle calibration.

Diagram: Simplified camera calirbation

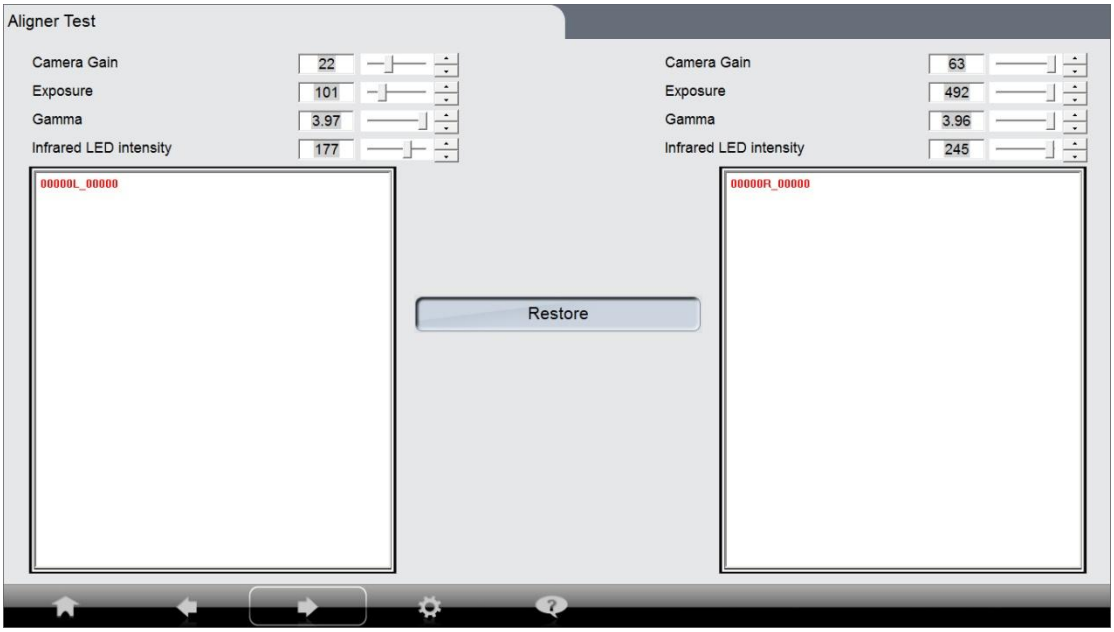



Diagram: Aligner test

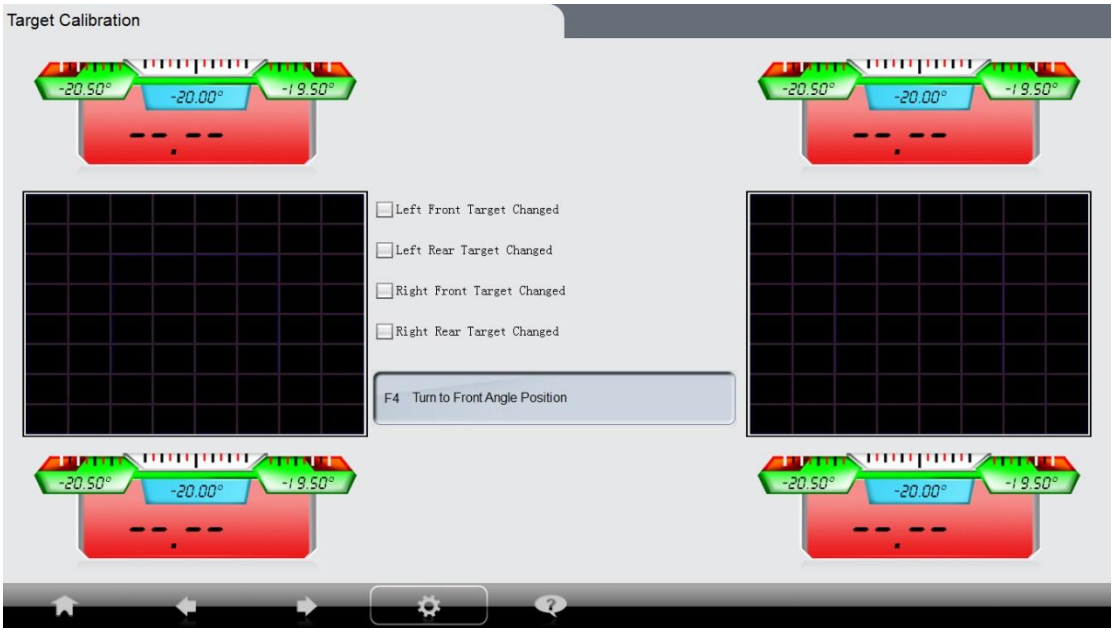



Diagram: target calibration

Diagram: Aligner Calibration

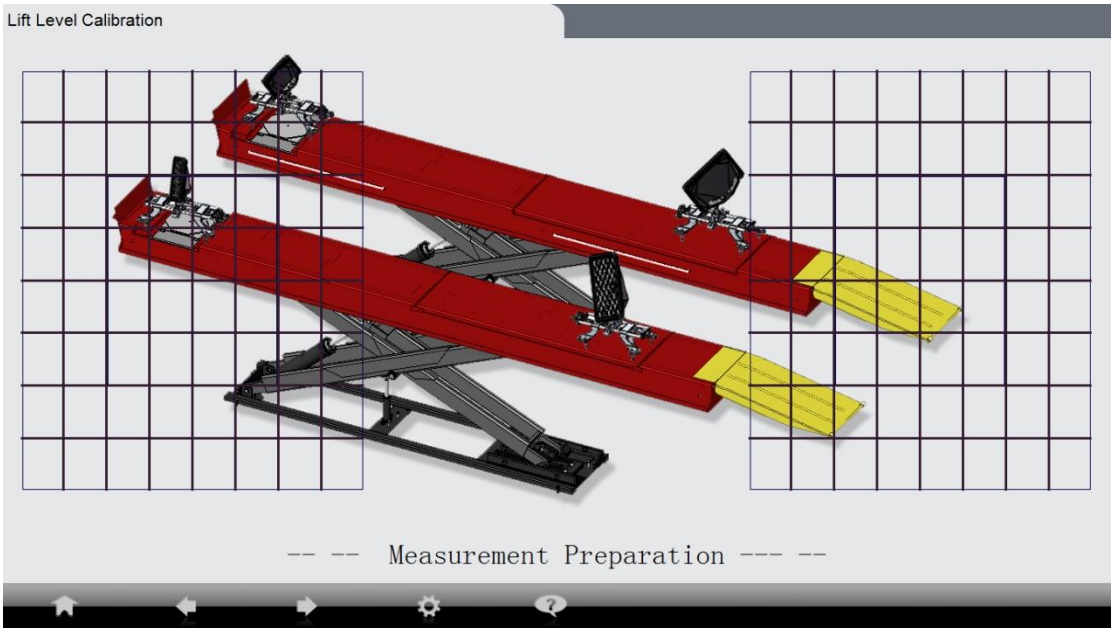



Diagram: Lift Calibration

- Click

or press F4 to enter database management. Enter password as “muenster”。

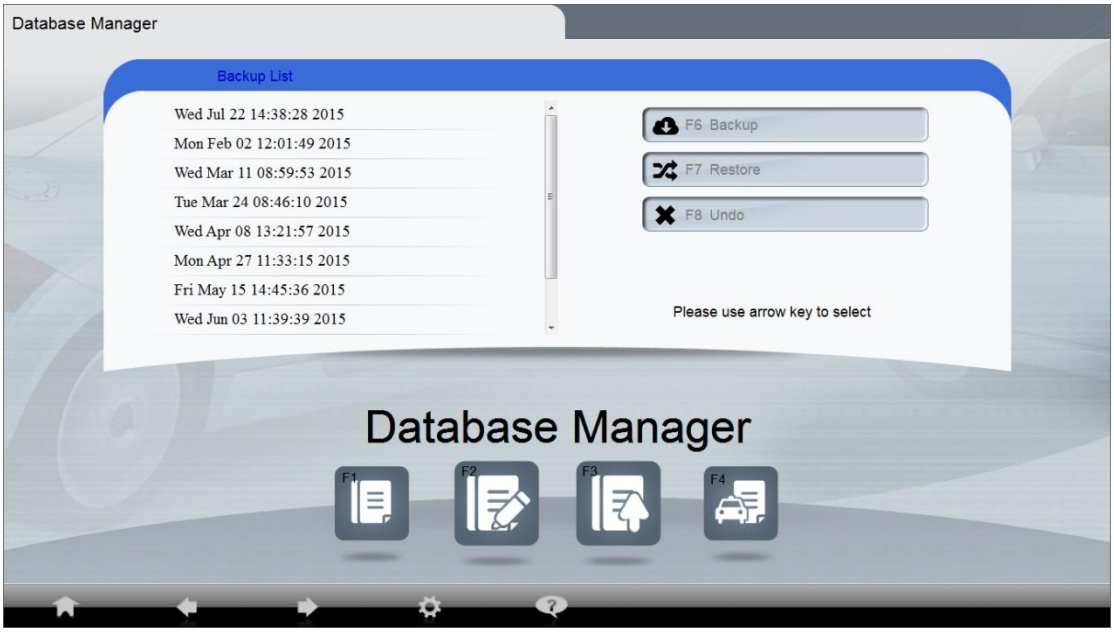



Diagram: Database management

Database management include vehicle database and customer database management. Operator can enter custom vehicle specs into database.

Database manager：

- Click or click F1 to add vehicle spec. Use arrow key to select manufacture. Click F1 again if the manufacturer is not available. When adding a new manufacturer, select nation first

Diagram: Select manufacturer

Diagram: Selection nation of manufacturer

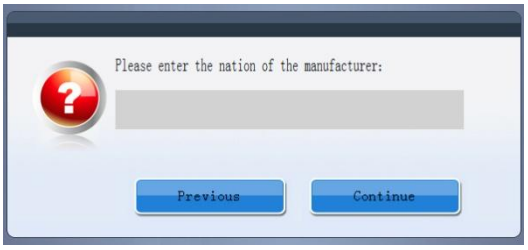



Diagram: Enter the nation of manufacturer

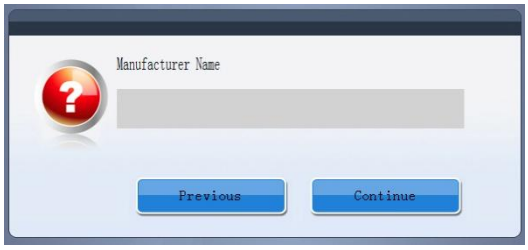



Diagram: Manufacturer name

Press PgDn to enter vehicle spec screen. Use arrow key to access different blocks.

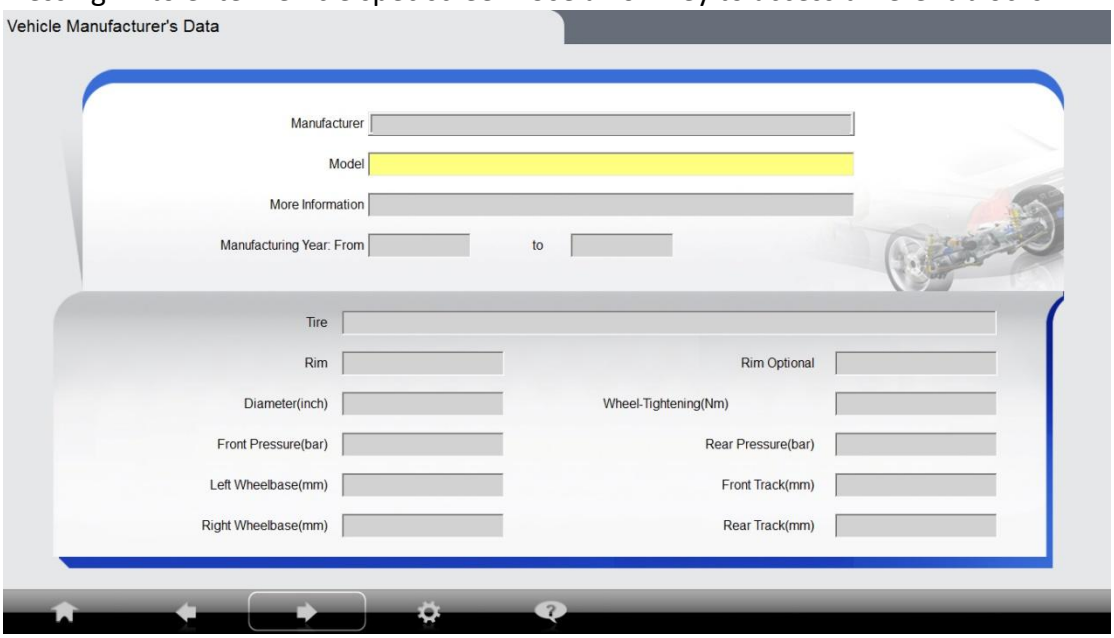



Diagram: Vehicle spec

After input data, press PgDn or next. Leave blank if data is not available.

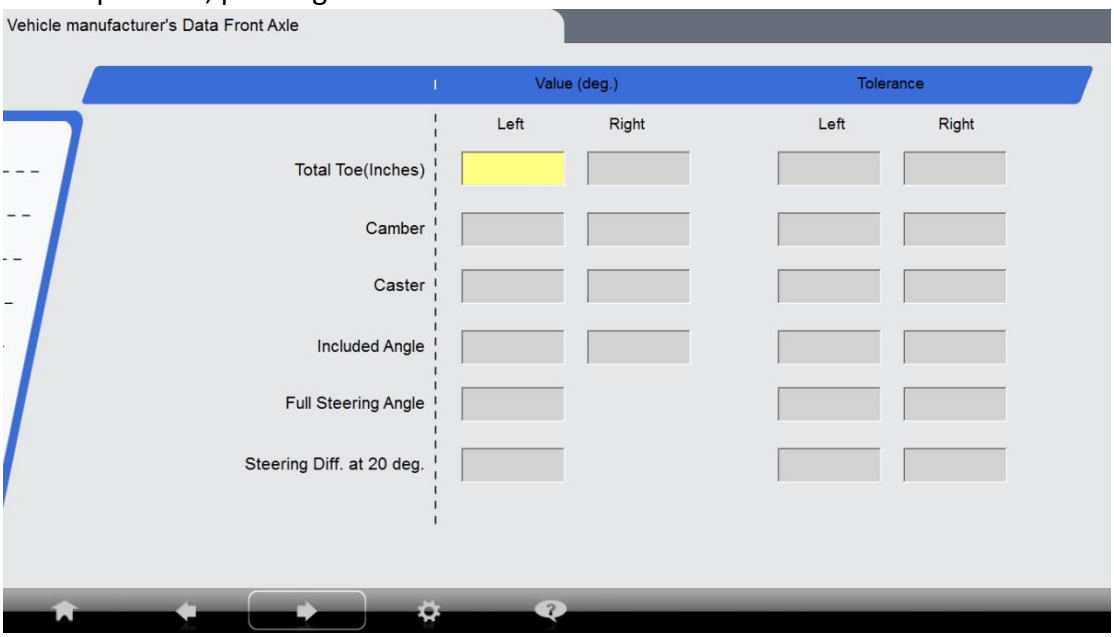



Diagram: Vehicle Spec – Front Axle

After enter front axle info, press PgDn to next screen.

Diagram: Vehicle Spec – Rear Axle

Press PgDn when finished to enter next page-leaving factory data.
Screen displays all data input. Check back and edit data by using PgUp to go back to previous page. Press PgDn to enter leaving factory data screen when finished editing. When all finished, press PgDn to save data. Go back to databank manager screen when finished.

- Click

or F2 to edit manufacturer spec.
- Click

or F3 to update vehicle data.

| |
|---|
| Only authorized technician should perform database update. Improper operation may cause database corrupted |

Exit SureAlign alignment software by press ESC key once, then press F8 , enter service password.

Get database update file from the manufacture or authorized local distributor

Copy supply.xpd or replace.xpd in root of C drive >> ie. C:/

Note: Supply.xpd will add new data to the existing database, thus may duplicate data. Replace.xpd will check and compare existing database then add only newer data to the database.

Attention: If customized data is entered and have the same vehicle name, year and model, the customized data may have been erased.

Once either the supply.xpd or replace.xpd is under C:/ root drive, click “aligner software” icon on the desktop to run alignment software. From the home screen, press F5-F4, enter service password, then F3. The alignment program will automatically update vehicle data. The middle of screen displays processing window. When upgrade is finished, this window disappears.

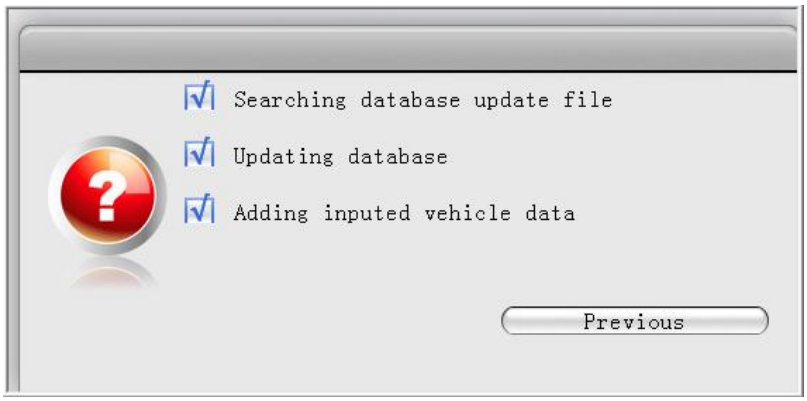



Diagram: Updating vehicle database

- Click

or F4 to use customer management.

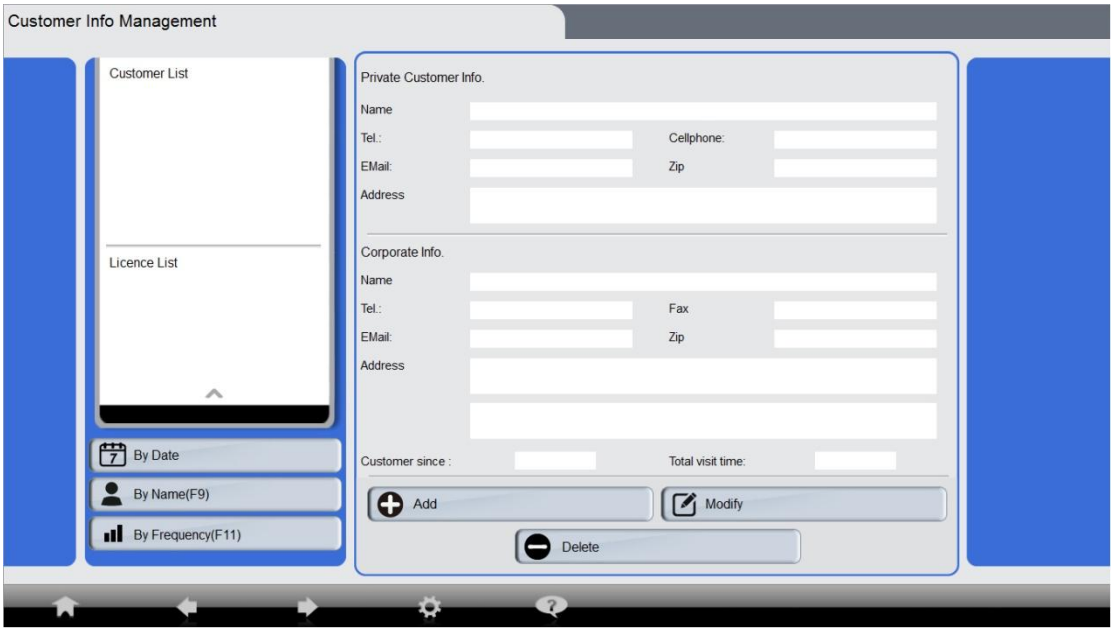



Diagram: Customer info Management

Customers' names are listed on the left side of screen. Select customer name by Up or Down arrow direction key. Right side of screen displays information of selected customers.

Press F8 or F9 or F11 to sort customers' name by required sequence.

Press F1 to add a new customer. Operator can input new customer data under new customer screen.

Press F2 to edit customer's information.

Press F3 to delete selected customer. Press PgDn to confirm.

Press Page Down to exit customer information manager screen. Press HOME to go back to main menu screen.

- Click

or F5 to set workshop info

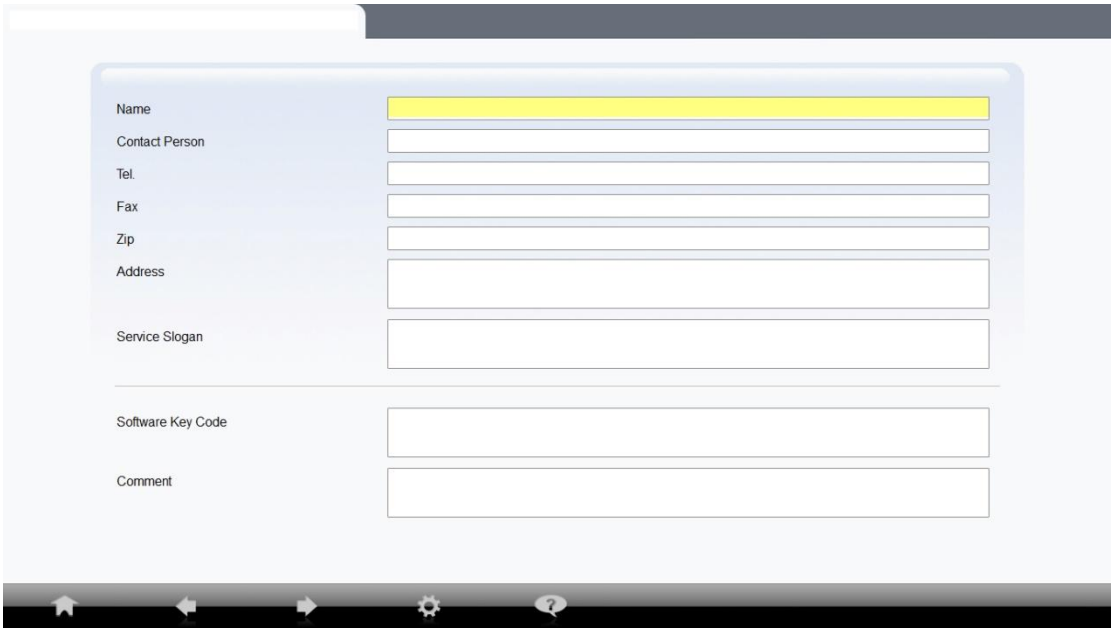



Diagram: workshop information

In this screen, you can customize workshop info. Enter workshop name, telephone number, fax or slogan and this will show on the print report.

# V. Technical data

## 5.1 Measuring Range

| Options | Range |
|---|---|
| Total Toe（Front and Rear Axle） | ±50° |
| Individual toe（Front axle） | ±25° |
| Camber（Front and Rear Axle） | ±15° |
| Setback | ±9° |
| Thrust Angle | ±9° |
| Caster | ±22° |
| King pin | ±22° |
| Wheelbase | 1.6-2.1m |
| Track width | 1.8-4.5m |
| Tire Diameter | 250-800mm |

## 5.2 Power supply unit

| Function | Specification |
|---|---|
| Power supply(voltage) | 220 – 240 V |
| Frequency | 50/60Hz |
| Power | 1Kw |

# Appendix I . Faults in operating sequence

| Description | Remedy |
|---|---|
| Computer does not start | Check power cable is firmly connected, check if the computer switch lights on.<br>Check the power bar is working properly<br>Check fuses in cabinet<br>Check power cable<br>Check if power cable has output voltage<br>Contact local authorized service centre |
| No display on monitor | Check if monitor switched on<br>Check if cable is firmly connected<br>Check power cable<br>Check VGA or DVI cable is connected<br>Contact local authorized service centre |
| Computer shuts off due to power surge, after restart, alignment software does not start. | After a power surge, computer software may become corrupted. Use backup software if available to restore to a previous working point. If reloading from OS needed, Contact local authorized service centre |
| Screen shows a black screen in alignment software and does not close. | 1. Check if the target has color lines or if the target is in the measuring range. Adjust the target position if needed.<br>2. If the target does not have color lines, but both targets are in the range, this can be the problem with both targets overlapping and interruption within the measuring range.<br>3. If the target does not have color lines, but both targets are in the range, no disturbance objects founts, target may be dirty. Clean target with care.<br>4. Cannot see target clear, but red LED beside camera is flashing. Use a cellphone camera to check if the LEDS are lighting up. Use front camera on an iphone as the rear camera of iPhone as a special filter. Check power adaptor has output voltage.<br>5. No target seen on the screen, exit software and rerun alignment software.<br>Contact local authorized service centre if needed. |
| After runout compensation, camber or toe value is very big | Measurement is interrupted during the measurement. Redo the run out compensation and check value.<br>Contact local authorized service centre if needed |
| Windows starts | 1. HASP key not found： |

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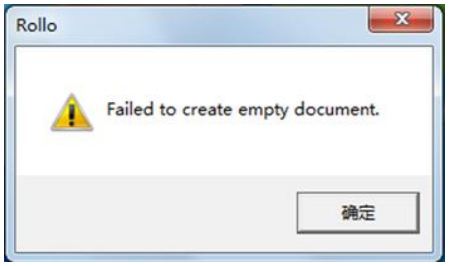
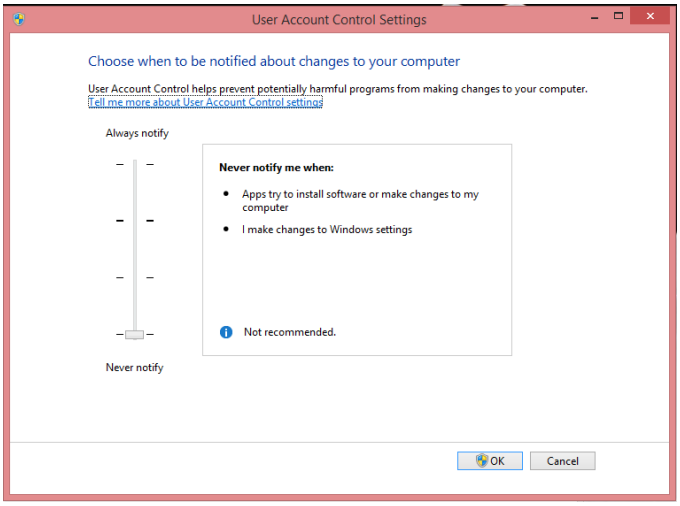
| ok but alignment software does not start | <br><br>● No software key is found on the computer<br>● Software key is plugged in but no red light on it, check driver is properly installed.<br>● If driver is not installed properly, download software key driver from HASP.com。<br>Contact local authorized service centre if needed.<br>2. Fail to create empty document.<br>  <br><br>This means database is corrupted<br>  <br><br>Recover database by going to c:/program files/wheel aligner/carcon<br>Delete ~carcon3.xpd<br>Rerun alignment software.<br><br>Check Settings in User Access Control and change the setting to Never<br>Control panel- User account and Family safety- user account- change user account |

| | |
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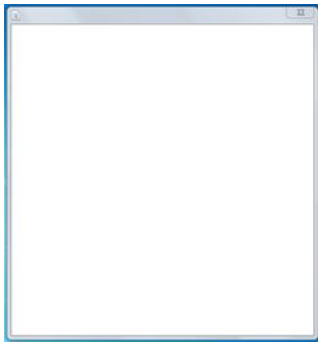
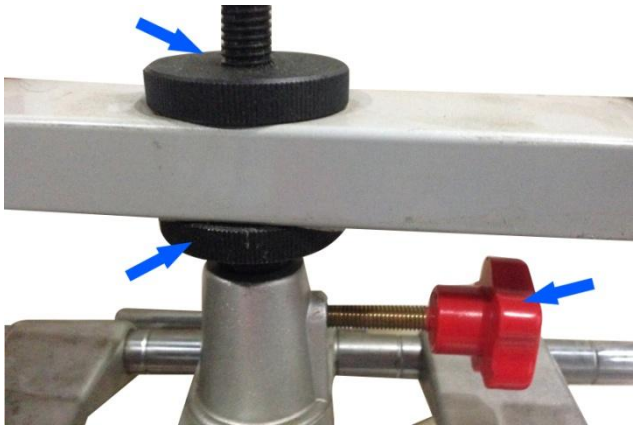
| | Contact local authorized service centre if needed<br>3. Executable software does not match software key.<br>  |
| Camera screen shows white? | Reconnect USB cable from camera to computer first. If does not solve the problem, check connect from USB cable to camera. Change cable if necessary. Contact local authorized service centre if needed |
| Restore camera data? | Main screen——F5——F3——enter password as ” admin”——F3——select backup data——open. |
| Backup camera data | Main screen——F5——F3——enter password as” admin”——F2——press f4 6 times——enter password as “admin”——save. |
| Check if post is leveled? | Use magnetic level to check if the post is leveled or not. |
| Camera adjustment tools? | 3mm、4mm、5mm Allen key. |

# Appendix II. Calibration Bar adjustment

## 1. Adjustment procedure

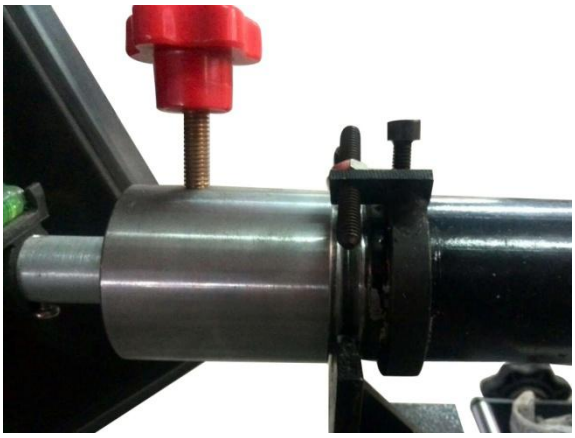
1. Repeated install/remove the connection joint to ensure the accuracy at the joint (at least 5 times.)

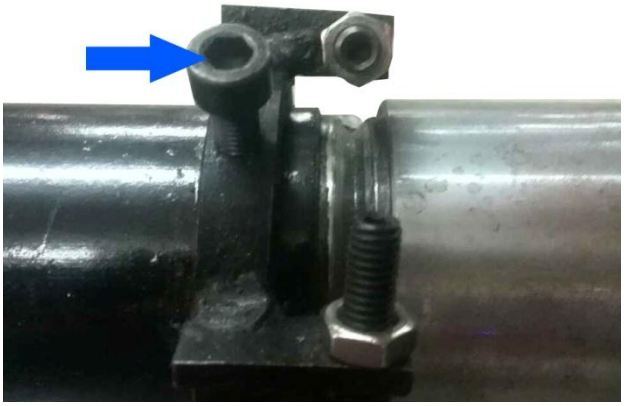
2. Tight the two screws on the joint, make sure the joint is firmly attached.
3. Lock the top and bottom screw on the calibration bar and ensure the calibration bar is fixed.



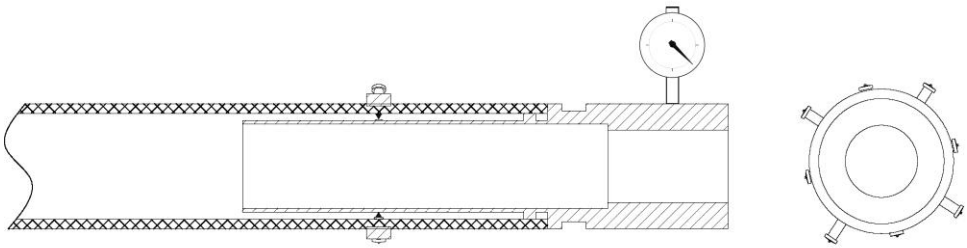
4. On one side of calibration bar, install a dial meter as illustrated below.

5. Loose the limiting tool so the calibration bar can be rotated.





6. Slowly rotate the camera bar, check the dial on dia meter and record the low and high point.
7. Adjust the screws on the calibration bar , loose one side then tight the other side as shown below.



8. Follow 6 and 7 until the run out is less than 0.03mm.
9. Adjust one side then the other side, until both calibration bar are within 0.03mm.

# 2. Warning

1. Before adjustment, make sure the clamp is firmly touching floor or surface, no movement is allowed.
2. During the adjustment, rotate the bar slowly in one direction. Rotate 10 or 20 degree each time. Check the value when it is still, find the high and low points.
3. During the measurement, do not use too much pressure, calibration fixture cannot move during the adjustment. If it is moved, redo the process.
4. After the adjustment, store the calibration bar in a safe location. Handling with care during the transportation. If damaged during the transportation, repeat this procedure.