

V1.01.000
2018-07-07

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Precautions

- Please read the User's Manual and the Installation and Parts Manual carefully before operating X-861.
- Only the qualified technician can operate the Wheel Aligner.
- The operator must have knowledge of computer application and basic theory of wheel alignment.
- The power voltage of X-861 is AC220V±10% 50±1Hz / AC110V±10% 60±1Hz (It can be customized according to the requirements of customer). The 3-terminal socket must be used, and the earth terminal must be well grounded. If the power voltage is not stable, please purchase and use AC voltage stabilizer.
- Before installing X-861 wheel aligner, the lift should be installed at first according to the requirements. Regularly check the lift for fastening and leveling, ensuring the test accuracy and personnel safety; Take away the roadblocks around the lift to prevent influencing operation.
- Don't install X-861 on a vibrated object or an oblique surface. Avoid direct sunlight and moisture.
- Turn off the power after operation. Check all bolts and parts after maintenance, and tighten the slackened bolts and parts in turn for safety.
- Since computer visual technology is used in recognizing the targets mounted on the wheels through the camera with high resolution, it is necessary to keep X-861 away from the outside infrared rays (e.g. sunlight) from directly lighting to the targets and reflecting to the cameras. It is also necessary to avoid blocking the light way from the targets to the cameras for a long time during the instrument is working.
- The targets of X-861 wheel aligner are the key components for testing. Do not damage their structures when using and storing. Keep the surface of target clean. Please use the soft cloth dipped with an appropriate amount of the neutral detergent or the absolute alcohol to wipe the surface of target lightly if there are some smuts on it.
- When using and storing, please pay much attention to prevent water from entering into the targets.
- The wires inside the post and the lateral beam are connected compactly. Don't touch or move them after first installation.
- The precision position calibration has been performed for the cameras after first installation, the user cannot move or wobble the post or lateral beam during or after using them.
- Without approval of the supplier, please do not disassemble the post and the lateral beam in order to avoid damaging the components, influencing the test accuracy and increasing the costs and

difficulties of maintenance and repair. For the damage caused by unauthorized disassembling will not be covered by the Warranty.

- The fastening method should be selected correctly and flexibly according to the actual conditions of the rim, the turning force should be equal when fastening, after fastening, please check the wheel clamp again.
- The force should be equal when using each knob, please don't fasten it too tight in order to avoid damaging the locking mechanism or other parts.
- After using, please cut off all power supply timely.
- The cameras of X-861 wheel aligner are the key optical components for testing. Do not impact them when using, keep the surface of the camera lens clean. Please use the lens paper to wipe the surface of the camera lens lightly if there are some smuts on it.

General Safety Instructions



Safety equipment may not be removed and/or disabled.



Any work on the electrical installation may only be performed by electricians.



The wheel alignment system may not be operated in explosion-prone surroundings.



The operator must provide appropriate fire protection measures at the measuring platform. In particular, any flammable or self-combusting items (such as cloths soaked in solvents or oil) and fluids, or foreign items and other ignition sources, should not be stored in the tool trolley.

Warning symbol tags used:



Legend: Pull the power plug before opening the housing!

Obligation by the operator to be considerate and avoid negligent acts:

The equipment was designed and constructed with consideration to required harmonized standards, as well as additional technical specifications. It therefore corresponds with the current state of technology and provides the maximum standard in safety during the operation.

The machine safety, however, can only be implemented during the operation, if all of the required steps have been taken. The operator of the machine has the obligation to plan these actions and check their compliance.

The operator must specifically verify that:

- The machine is only used according to specifications.
- The machine is only operated in perfect operational condition and that the safety equipment is routinely inspected as to their operational condition.
- The necessary personal safety equipment for operating, maintenance and repair personnel is available and being worn.
- The operating instructions are always in a legible condition and are completely available at the machine location.
- The machine is only operated, maintained and repaired by qualified and authorized personnel.
- The related personnel is instructed routinely in all pertaining questions of work safety and environmental protection, and knows the operating instructions, especially the safety instructions contained therein.
- All safety and warning labels attached to the machine are not removed and are legible.

Concrete safety instructions and applied symbols

Concrete safety instructions are provided in the following operating instructions which will point out any unavoidable remaining risks during the machine operation. These remaining risks contain hazards for:

Persons
Product and machine
The environment

Symbols used in the operating instructions should draw attention to the safety signs!



This symbol points out that specifically personal injury risks may be anticipated (Mortal danger, risk of injuries).



This symbol signifies that especially hazards for the machine, material and the environment may be encountered.

The most important objective of the safety signs exists in the prevention of personal injuries.

If the warning triangle with the wording “danger” is on a safety notice, hazards for the machine, material and the environment are not excluded.

If the warning triangle with the wording “caution” is on a safety reference, personal injuries are not anticipated.

The applied symbol cannot replace the text of the safety reference. The text must therefore always be completely read!

Basic safety measures during normal operations:

The machine may only be operated by trained and authorized personnel who know the operating instructions and are capable of working with them!

Prior to switching the machine on, check and verify that: Only authorized personnel are located within the working range of the machine.

No one can be injured when the machine is activated! Check the machine for visible damages prior to use and verify that it is only operated in perfect condition! Report any problems immediately to the supervisor!

Prior to each operating start, check and verify that all safety equipment operates perfectly!

Basic safety measures during service and maintenance:

Adhere to the inspection and maintenance intervals specified in the operating instructions!



Block access to the work area of the machine to unauthorized personnel prior to performing maintenance or repairs! Attach or set up a warning sign that points out maintenance or repair work!



Pull the power plug prior to any maintenance or repair work or switch off the main switch for the power supply and secure with a lock, if the power supply is installed.

The key to this lock must be in the hands of the person that is completing the maintenance or repair work! Only use perfect load suspension and lifting equipment when replacing heavy machine parts!



Properly dispose of environmentally

hazardous lubricants, coolants or cleaning agents!

Working on the electrical equipment:



Repairs on electrical equipment of the machine may only be performed by trained electricians!
Electrical equipment must be routinely inspected!
Re-attach any loose connections!
Immediately replace damaged lines/cables!
Always keep housings of electrical equipment closed!
Access is only permitted for authorized personnel with key/tools!
Never spray the housing of electrical equipment with a hose when cleaning!

Observe environmental regulations:



The legal regulations for waste prevention and proper recycling/disposal must be adhered to for all operations on and with the machine.
Especially during installation, repair and maintenance operations, water-polluting materials, such as:
Lubricants and oils - hydraulic oils - coolants.

Solvent-containing cleaning liquids may not pollute the ground or reach the sewage system!!
These materials must be stored, transported, collected and disposed of in suitable containers!

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Introduction

Thank you for using **X-861 wheel aligner** manufactured by **LAUNCH TECH CO., LTD.**

Definition

X-861 wheel aligner is a precision measurement instrument. The camera can automatically trace the target within 0-1800mm of the measurement height to measure the wheel alignment parameters and compare them with the specifications provided by vehicle manufacturer. It also gives instructions to the user for performing corresponding adjustments so as to get the best steering performance and reduce tire wear.

When Is Wheel Alignment Required

- The driver must firmly hold the steering wheel to maintain a straight-ahead driving.
- Abnormal wear of tires occurred, such as single side wear, concave-convexity wear and featheriness wear.
- Too heavy or too light steering, or shaking at high-speed driving.
- When the tire(s), steering joint or shock absorber are replaced.
- When the vehicle is impacted.
- After the vehicle has run for the first 3000km or 10000km.

Main Vehicle Alignment Parameter

The wheel alignment mainly consists of camber, caster, toe-in, steering axis inclination, toe-out on turns, wheelbase difference, track width difference, etc. They are designed mainly to improve the steering performance and driving stability of the vehicle, and reduce tire wear.

Toe-in and Toe-out

The toe setting is the amount by which the front or rear wheels point inwards or outwards at the front of the wheel in relation to each other (see Fig.1.1).

When the wheels point inwards they are said to toe-in, toe-in figures are given a positive value. Conversely when the wheels point outwards they are said to be toe-out and the figures are shown as a negative value.

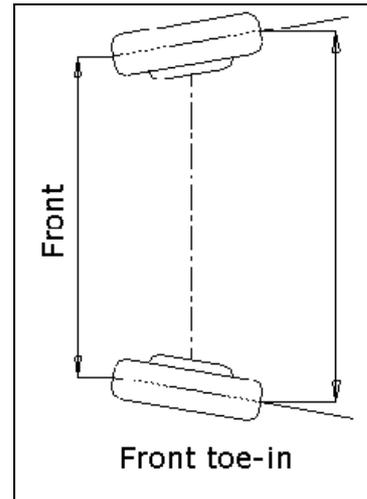


Fig.1.1

The purpose of correct toe is to ensure that the wheels run parallel when the vehicle is driving. An incorrect toe setting may affect the stability and controllability of the vehicle.

Camber

Camber is the leaning of the wheel inwards or outwards from the vertical.

If the road wheel leans outwards from the vertical, it is said to have positive camber and when leaning inwards from the vertical - negative camber, looking from the front or rear of the vehicle. See Fig.1.2.

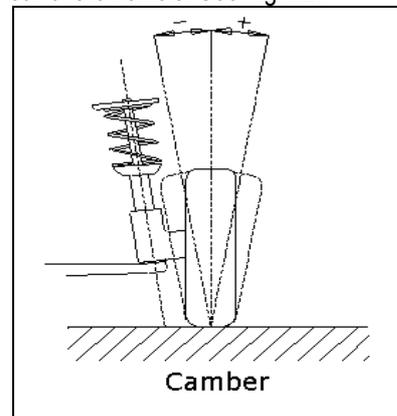


Fig.1.2

Camber is measured in degrees.

Steering Axis Inclination

Steering Axis Inclination (SAI) is the angle of inclination of the kingpin towards the center-line of the vehicle from the vertical (see Fig.1.3).

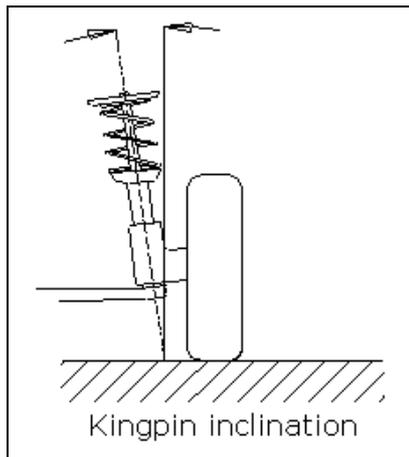


Fig.1.3

Correct steering axis inclination can equalize the loads applied on bearings so that the life of bearings can be prolonged and the controllability of steering is improved.

Without the inclination, the controllability of the steering may be affected; further more, the vehicle weight and the ground counterforce may cause significant stress in the axle and finally damage the axle.

Correct inclination of kingpin is also helpful for the vehicle to restore its straight-ahead position after steering.

Steering axis inclination is determined when the vehicle suspension is designed. It is not service adjustable.

Caster

Caster is the tilting of the kingpin either forwards or backwards from vertical, as viewed from side of the vehicle. See Fig.1.4

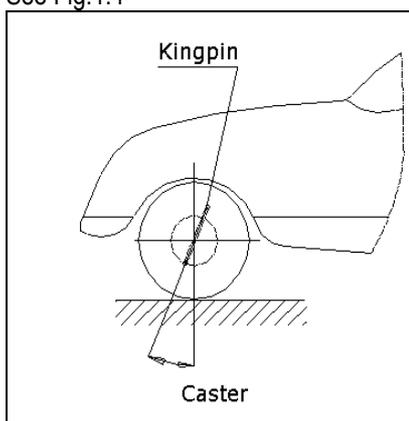


Fig.1.4

When the kingpin is tilted backwards from the vertical, caster is positive. When the kingpin is tilted forwards, caster is negative.

Caster angle influences the directional stability of the steering. To increase the tendency of the steering to self-centre, the steering will normally be designed with

positive caster.

Toe-out on Turns

Toe-out on turns is defined as the difference of the steering angle between the two front wheels when turning left or right by 20° as shown in Figure 1.5. The inner wheel will turn more degrees than the outer wheel when the vehicle is steered, the difference is usually about 2° . This angle is designed to reduce steering resistance.

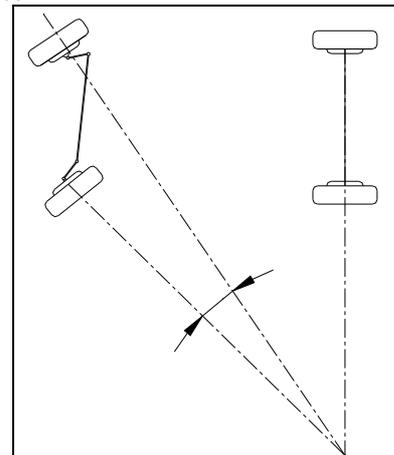


Fig.1.5

Note: This angle can be tested when a turntable is equipped for X-861.

Thrust angle

The thrust angle is defined according to the driven mode of vehicle.

- Rear wheel driven: The thrust angle equals half of the toe-in difference between the two rear wheels. As shown in Fig.1.6.
- Front wheel driven: The thrust angle equals half of the toe-in difference between the two front wheels.
- Four-wheel driven: The thrust angle equals half of the toe-in difference between the two front wheels plus half of the toe-in difference between the two rear wheels.

The thrust angle is defined as positive when the thrust line is towards left, and negative when the line is towards right.

If the thrust angle is not zero, the vehicle will have the side-moving trend. In this case, adjust the front toe-in of the drive wheels first, and then adjust the toe-in of driven wheels.

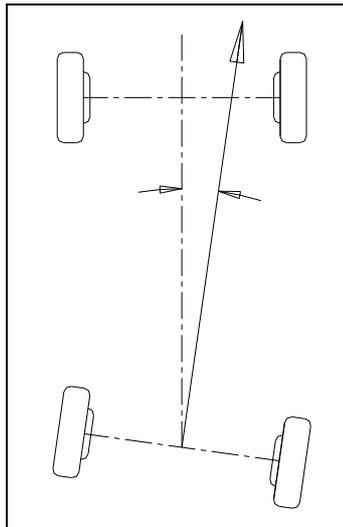


Fig.1.6

Wheelbase Difference

Wheelbase difference is defined as the angle between the joint line of the centre of two rear wheels and that of the front wheels. It is positive when distance between the centre of the right wheels is large than that of left wheels; and negative otherwise. If the track width is available from the vehicle specifications, then the wheelbase difference can be also expressed by angle. See Fig. 1.7

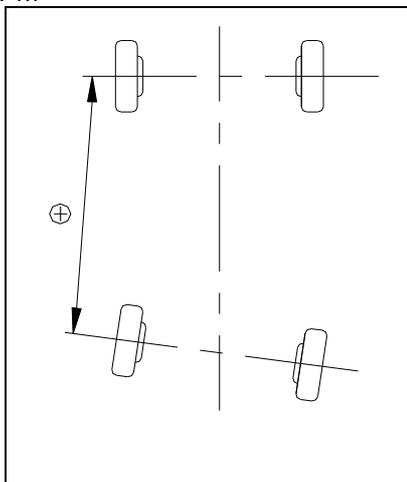


Fig. 1.7

Track width Difference

Track width difference is defined as the angle between the joint line of the ground-contact point of left wheels and that of the right wheels. It is positive when distance between the centre of the rear wheels is large than that of front wheels; and negative otherwise. If the wheelbases are available from the vehicle specifications, then the track width difference can be also expressed by angle. See Fig. 1.8.

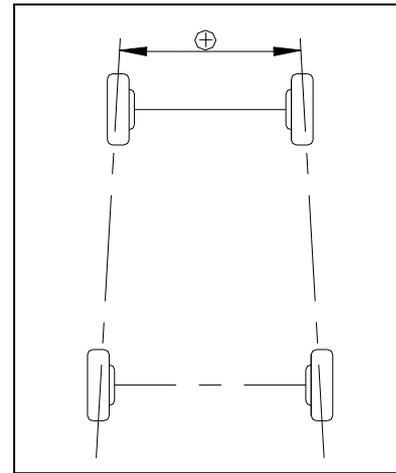


Fig. 1.8

Left (right) lateral offset angle

The relative offset in lateral direction between front axle and rear axle of vehicle is axle offset. When rear wheel axle is offset to right from the front wheel, the axle offset is positive, otherwise is negative. The angle between the bisector of the track width difference angle and the thrust line is axle offset angle.

Axle offset angle

The relative offset in lateral direction between front and rear axle of vehicle is axle offset. When LR (RR) wheel is offset outside from LF (RF) wheel, the left (right) lateral offset is positive, otherwise is negative. The angle between the connecting line from the front wheel center point to the rear wheel center point (same side) and the thrust line is left (right) lateral offset.

Delay angle

The angle between the connecting line from the LF (LR) wheel center point to the RF (RR) wheel center point and the perpendicular of the longitudinal geometry center line is called front (rear) delay angle. When the right wheel on the front (rear) axle is behind the left wheel, the front (rear) delay (angle) is positive, otherwise is negative.

Included angle

The sum of the SAI (Steering Axis Inclination) and the wheel camber is called included angle.

Functions and Features

- Complete test: The X-861 wheel aligner can be used to measure the most wheel alignment parameters, such as front wheel toe-in, front wheel camber, caster, steering axis inclination, thrust angle, rear wheel toe-in, rear wheel camber, wheelbase difference, track width difference, etc.
- Brand new 3D computer vision measurement: automatically test the aligning angles with high

- performance camera.
- Positive targets: There are no electronic components inside the targets, and no cables between the targets and the main unit, so the targets are very reliable and very convenient to use.
 - Provides many kinds of auto test processes and diagram operating interfaces, very simple and clear to operate; the whole test process can be performed automatically, and there are some humanity tips on the corresponding interfaces.
 - Complete databank: Wheel alignment data of over 20,000 vehicle models is stored in the system.
- User can also add new data to the databank.
 - It can save the history data, easy for customer measurement.
 - Profuse vehicle adjustment animation and HELP information.
 - Provide real-time help with help system.
 - Provide the function of data back-up and restoration, and of software upgrade.
 - Provide the function of camera searching for the target automatically/manually and the function of camera tracing the target dynamically.

Specifications

Item	Test Range
Toe-in	0~±20°
Camber	0~±10°
Caster	0~±20°
Steering axis inclination	0~±20°
Thrust angle	0~±5°

Notes:

1. *The right of changing the design will be reserved by manufacturer;*
2. *The above test range can be confirmed only when the user follows the specified operation procedures.*

Requirements on Surroundings

Item	Specifications
Storage temperature	-10°C~+55°C
Working temperature	0°C~+40°C
Relative humidity	≤85%
Light requirement	No direct strong lights irradiate the target and reflect to the camera
The height difference between the left rail and right rail of lift	<2mm (front to rear)

Working Principle

The working framework of X-861 wheel aligner is as shown in Fig.1.9. The whole system is composed of data collecting system and data processing system.

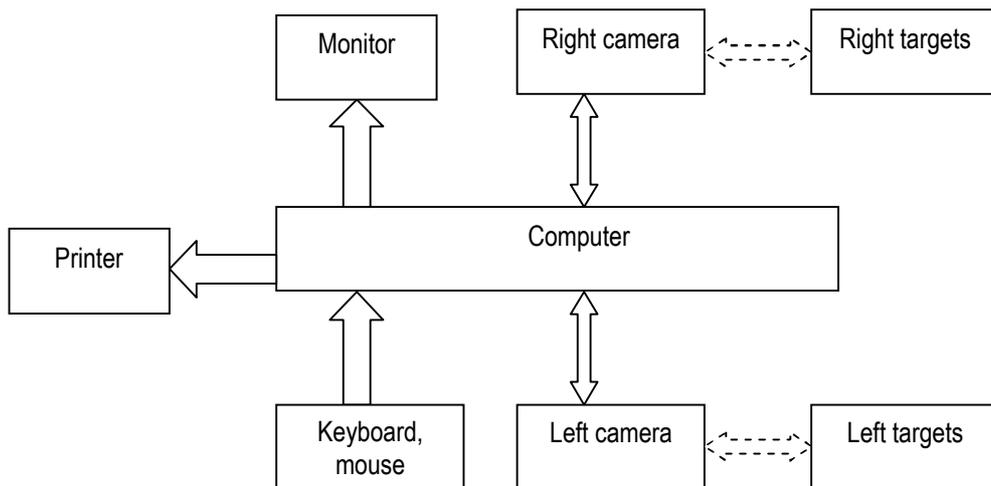


Fig.1.9

The data collecting system consists of 2 cameras with high resolution and 4 targets. The left and right cameras capture the images on the left and right targets, and transmit them to the data processing system. The targets are attached on the wheel rims via wheel clamps. So the geometrical relationships among 4 wheel rims are calculated according to the images captured by cameras from the targets and further to confirm the aligning parameters of the wheels.

The data processing system is the core part of X-861 wheel aligner. It consists of a computer, power supply system and interfaces. Its function is to execute the operation commands, process the data and display the information together with the original data of vehicle manufacturer. It also gives instructions for making adjustment to the vehicle and print out corresponding report.

The wheel aligner compares the measured results with the original data of vehicle manufacturer and gives instructions to the user for adjustment, so its databank should contain enough information. X-861 wheel aligner's databank contains over 20,000 models alignment data, and user can also add new vehicle wheel alignment data into the databank when necessary.

Structures

assembly , cabinet(including computer host, monitor, keyboard and mouse), lateral beam assembly (including cameras), wheel clamps, targets, communication cables, mechanical turntables, steering wheel holder and brake pedal depressor, etc. The overall structure of X-861 wheel aligner is as shown in Fig.2.1.

Overall Structures

X-861 wheel aligner mainly consists of the post

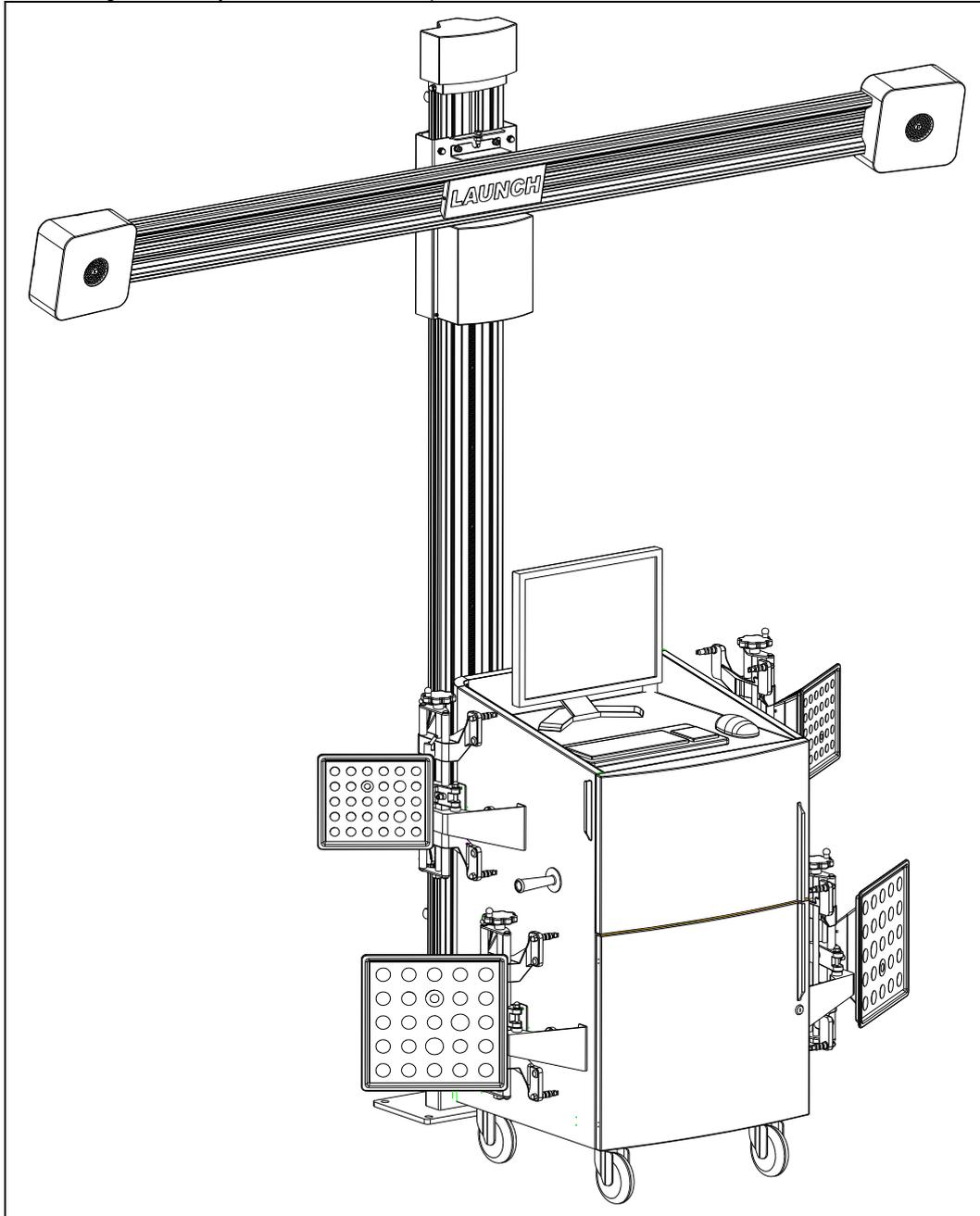


Fig.2.1

Wheel Clamps and Targets

X-861 wheel aligner has 4 target-clamp assemblies, which are monitored by cameras, are the key components for whole test system. There are some bull-eye signs for installing the wheel on the targets as shown in Fig.2.2.



Fig.2.2

The installation of wheel clamp is crucial to the test result. The claws should be in even contact with the wheel rim without touching the lead weight.

Communication Cables

There are 2 USB signal cables, 1 RS232 signal cable and 1 power supply cable between the computer host and the cameras of X-861 wheel aligner, please take care to prevent the cables from being damaged.

Turntable and Transition Bridge

X-861 has two mechanical turntables (standard configuration, see Fig.2.3).



Fig.2.3 mechanical turntables

The turntables are placed at the front wheel positions of the vehicle on the lift. Each turntable is equipped with a transition bridge, the transition bridge is placed between the turntable and the lift to ensure the wheel move on the turntable smoothly.

Basic Operation Procedures

Get Vehicle Information

Ask the owner for vehicle drivability problems, symptoms, and wheel alignment history, and find out vehicle information such as make, model and year, etc.

Check each chassis part carefully, including rubber boot, bearing, rock arm, tripod end, shock absorber, tie rod end and steering mechanism, for any looseness or wear. Then check to see if the tire pressure, tire track widths of the left and right wheels are alike.

Wheel Alignment Checking

Perform the wheel alignment checking after the initial condition is known.

Adjustment

If the measured values are not in accordance with the specifications given in the databank, the appropriate wheel alignment adjustment should be performed.

Test-drive

After finishing the wheel alignment, test the vehicle to see if the abnormal conditions are eliminated. Re-perform the wheel alignment if necessary.

Operation Instructions

Preparation

1. Ask the owner for vehicle drivability problems and symptoms, wheel alignment history, and find out vehicle information such as make, model and year, etc.
2. Drive the vehicle onto the lift or over the pit, ensure that the front wheels are centered with the turntables; Apply hand brake to ensure human safety. To prevent the turntable from turning, lock the turntables with the lock pins before driving the vehicle; release the lock pins after the vehicle is placed well.
3. Check each chassis part carefully, include dust cover, bearing, rock arm, tripod end, shock absorber, tie rod end and steering mechanism, for any looseness or wear. Then check to see if the tire pressure and track widths of the left and right wheels are alike.
4. Install the wheel clamp-target assembly on the wheel and turn the knob to lock the wheel clamp. The claws of the wheel clamp should be fixed on the external or internal edge of the rim according to the practical condition. Ensure equal depth for each claw and avoid attaching it on the distorted area. Use the safety belt to bind the wheel clamp to the wheel rim to avoid falling accidentally.
5. Insert the power plug of the wheel aligner into the standard 3-pole power receptacle.

Program Operation

Turn on the power switch, start the computer and enter the main interface of the measurement program. The screen displays the main function menu. There are 3 functions available in the main menu: [Alignment], [Preferences], [Maintenance]. See Fig.4.1 and Fig.4.2.



Fig.4.1

All wheel alignment functions begin from the Home Alignment tab which is the default or “home” screen. The screen contains a series of icons that execute alignment related functions. The Home key, located along the toolbar, always returns to this screen.

A description of the function icons is given below.



Fig.2.1

1-Run Wizard – The Wizard selection launches a pre-programmed alignment process of gathering the alignment angles. The process is directed by the Wizard that is selected at that time.

2-Vehicle Selection – To select the Make, Year, and Model of the vehicle to be aligned.

3-Vehicle Specifications – Displays the selected vehicle's alignment specifications and gives access to adjustment animations and assistance.

4-Customer Data – This advanced feature, when activated, opens a data entry screen used to record customer information and his vehicle information. Information can then be retrieved alphabetically.

5-Measure Menu – This group of icons allow quick access to several angular measurement screens such as Caster, SAI, Steering Angles, and Vehicle Dimensions.

6-Adjust Menu – This selection of icons gives access to a variety of features that assist the technician with adjustment of alignment angles. Some of these features include Live Caster, A-arm Adjust, Rear Shim Programs, and Cradle Adjust.

7-Exit-To Exit and shutdown the computer.

Using the Wizard Procedure

The Wizard procedure sets the aligner to follow a certain process path resulting in a completed alignment. Each pre-programmed procedure, called a Wizard, sets the aligner up to perform certain functions in a redetermined order and determines whether certain functions can be skipped.

Begin a New Alignment

This screen gives the choice to start a new alignment or continue with an alignment already in progress. If the "OK" icon is selected the computer memory of the previous alignment is erased allowing a new customer and vehicle to be setup. If the "Continue current alignment" icon is selected, all customer, vehicle, and alignment measurements are retained and the software returns to the alignment readings screens. Select Vehicle Manufacturer, Year and Model.

Tip: The order of the manufacturer, year, and model appear will vary depending on how the specifications are set up (see Setup).

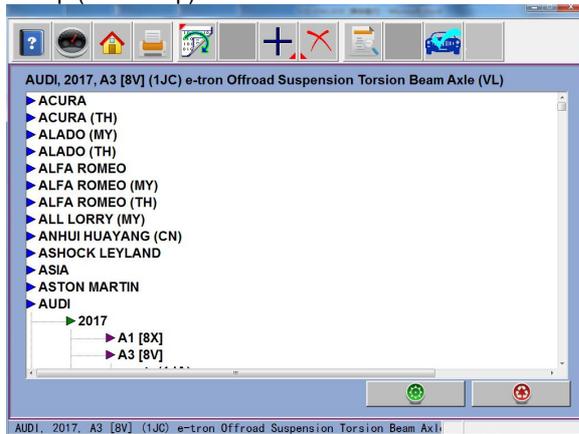


Fig.2.2

Vehicle Manufacturer

This screen shows the vehicle manufacturers in specification database.

The vertical scroll bar on the right indicates there are additional choices further down the page. Click on the down arrow on the scroll bar move down. Using the down arrow key on the keyboard also moves down the screen. Once the desired manufacturer is in view, double-click on the name to expand out the model selections.

Double-click again to contract. Also, the keyboard's right arrow key expands and the left arrow key contracts the list.

Vehicle Year

Select the year of manufacture using the up/down keys or pointing device on the scroll bar to move up or down to the desired year, then double-click or press the right arrow key to expand out the years this model was made.

Vehicle Model

Use the direction keys or pointing device to select the model of the vehicle, then select "OK", press Enter, or double click the selection.

View Specifications

This screen displays Year, Manufacturer, and Model of

the selected vehicle with Minimum, Preferred and Maximum specifications for the front and rear wheels. Dashes in any position indicate there are no manufacturer specifications for that wheel or angle. For angles not displayed on this screen, refer to the specification book included in the literature package. A "wrench" icon to the right of the specifications field indicates the Aligner has assistance available for adjusting that angle. Clicking on the wrench launches the adjustment help features described on the next page. The Edit Specs toolbar button (F8) allows editing of the displayed specifications prior to beginning the measurements. This is useful if a Technical Bulletin has been issued that alters manufacturer's specifications. Pressing "Ctrl-Alt-F8" simultaneously allows specs to be viewed at any time from within the alignment process.

Adjustment Animation (Optional function)

Illustrations of adjustments specific to the selected vehicle can be viewed by clicking on the "wrench" icon to the right of the specifications field.

Animations are also accessible from the readings screen. An animation of the adjustment procedure will appear on the screen. Animations can be paused, stopped and restarted at the operator preference by using the controls at the immediate bottom of the animation screen. Select "OK" or "Cancel" to return the operation to the current screen.

Additional Assistance

Included to the right of the animation window is a text box which illustrates three types of information regarding the current alignment adjust procedure.

Information is requested by clicking on the icon associated with the assistance.

These icons are:

. Adjustment Instructions

Adjustment instructions are provided by selecting the first of three function buttons on the Animation screen.

. Parts Required

The center selection displays parts required to complete the alignment process, parts such as shims, eccentrics or other aftermarket supplied parts.

The displayed parts are linked to the selected shim manufacturer setup in the "Preferences" section.

Enter Customer Data

The Customer Database feature allows entry of information about the customer and his vehicle. With the database this information can be saved for later recall. In addition, the aligner stores this information along with the results of the wheel alignment service.

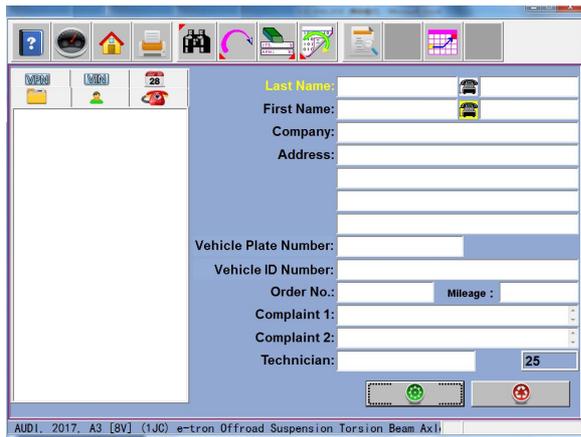


Fig.2.3

A database is a collection of information to be sorted and retrieved as needed for analysis. Available information includes the car owner's name, address, phone number; the vehicle make/model/year, VIN number, and mileage; plus the date of service along with before and after alignment readings. This information is stored on the computer hard drive for later retrieval. Once retrieved, the information can be reviewed and can become the starting point for a new alignment

Adding Customer Information & a New Customer

Using the “mouse” device or TAB key to move around each of the text blocks, the operator enters information about the customer and his vehicle using the keyboard. Selecting OK will save the record to file for later retrieval.

A new record can be entered by clearing all information on the data window.

Information is cleared by selecting Clear Fields on the toolbar (F7). Once the screen has been cleared, enter the new customer information as desired. If another record is desired for an existing customer, highlight his name as using the pointing device, and begin entering information at the blank screen.

Selecting a Stored Record

Stored or existing records can be sorted and retrieved in several different ways – drill down through data records, sort alphabetically by last name, by telephone number, vehicle license plate number, vehicle VIN number, by date or by listing of all records. Once the desired record is visible, clicking on the plus sign expands the list to bring up a particular data set. When selecting alphabetically, select the first letter of the customers name and highlight it using the pointing device. Double click with the left button when the desired record is highlighted. The complete record will be displayed with stored data.

Editing an Existing Record

An existing record can be edited by selecting the desired customer record. Once the record is displayed, move between information fields with the pointing device or

TAB key. When the “I” bar is within the field to be edited, make the desired corrections. Data is saved when “OK” is entered.

Inspection

Inspection reports are a valuable tool for the reporting of vehicle problem areas. Reports can be printed and retained for shop files or given to the customer to reinforce his comprehension of the work performed, or the work necessary before an alignment can be performed. In many cases worn or damaged components will affect the quality of the wheel alignment.

A Wizard procedure can contain up to six vehicle inspection reports or lists.

These lists are contained within the Wizard process or they can be selected manually selected from the Main Alignment tab.

- . Pre-Alignment Inspection
- . Tire Inspection
- . Brake Inspection
- . Under Car Inspection
- . Under Hood Inspection
- . Courtesy Inspection

Vehicle Positioning Sequence

The next screen displayed is the Target Acquisition screen. This screen shows the status of each target and prompts the operator to proceed to the next step when all four targets have been acquired. The vehicle is then moved approximately 8" (20 cm) causing the targets to rotate about the spindle. The computer compares the initial target positions with the final target positions to calculate the axis of rotation for each wheel.

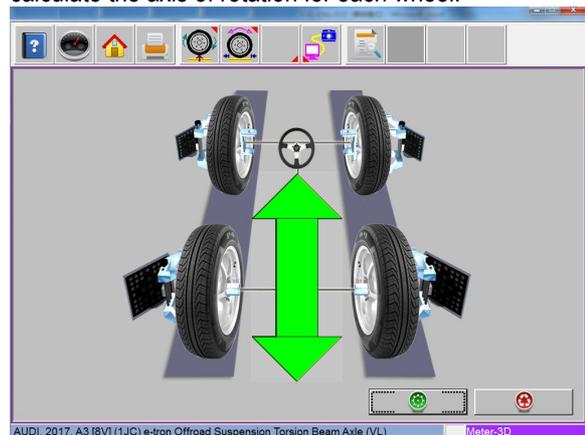


Fig.2.4

When the Target Acquisition screen is first displayed the cameras search for the wheel targets.

The graphic images of each wheel target are shown away from the wheel and are displayed in red. As the cameras locate each of the wheel targets, the target graphics change from red to blue and appear installed on the wheel.

This means the target has been “acquired”. When all four wheel targets are located, the first Vehicle Positioning screen is displayed.

NOTE: If one or more targets are never acquired, chose the Camera View button (F8) on the toolbar to help determine the cause, such as blocked vision.

The Vehicle Positioning screen displays arrows that prompt you to move the vehicle backwards, approximately 8 inches (20 cm). Find a spot under the front of the car to push backwards. Some users prefer to use the left rear wheel to pull the vehicle back. The graphic image on the screen follows the vehicle's movement as you roll the vehicle backward.

Too Far Back

A small red STOP sign will prompt you when the necessary backward wheel rotation has been reached. Hold the vehicle steady until the RED stop sign disappears.

When the aligner is ready, the screen displays a green arrow to prompt you to move the vehicle forward and return it to its starting position. Grab the vehicle where it is convenient and roll it forward onto the turntables where it began.

Wheel Wobble Message

The aligner may detect wheel wobble during positioning. The screen indicates which wheel wobbled. To ensure high accuracy, we recommend restarting the positioning sequence if wheel wobble is detected. Select the OK button to return to the Target Acquisition screen to repeat vehicle positioning. If the CANCEL button is selected the software will accept the out-of-tolerance positioning values and proceed.

Install Brake Pedal Depressor and Pull Turntable and Slip-plate Pins

Once positioning has been completed a prompt appears to install the brake pedal depressor. This is done to prevent rolling of the wheel during the Caster/SAI swing. Wheel roll during the swing results in incorrect SAI measurements. It is suggested you repeat the swing unless it is known the vehicle is without caster or SAI problems.

Perform Steering Angle Measurement

The Standard Wizard goes to the Steering Measurement screen before displaying any readings. It is also possible to begin steering measurements from any of the readings screens by simply rotating the steering wheel in either direction, assuming this has been set up from Features on the Preferences tab. As you rotate the steering wheel, the aligner tracks the wheel targets. When the steering wheel is rotated more than 5 degrees, the Steering Measurement screen is automatically displayed. Seven steering measurement position icons

are displayed across the top of the screen, three icons for right-turn measurements, three icons for left-turn measurements, and a center steering wheel icon.

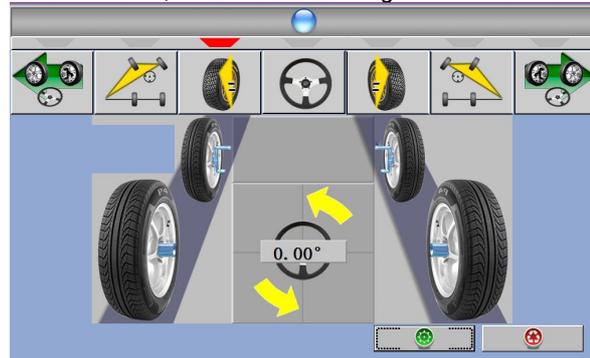


Fig.2.5

The icons indicate the steering positions for measuring caster and steering axis inclination (SAI) simultaneously, toe-out-on-turns (TOOT), and maximum steering angle. As you rotate the steering wheel toward each measurement position, a “cursor ball” at the top of the screen tracks the wheel movement, and a red status bar appears above the desired icon.

The left and right caster and SAI measurement positions are at approximately +10 and -10 degrees, while the TOOT positions are at approximately +20 and -20 degrees. The maximum steering angle positions vary, depending on the vehicle.

Arrows adjacent to the steering wheel displayed in the lower portion of the screen prompt the correct direction to rotate the steering wheel. A numerical readout in the center of the steering wheel indicates the steering angle in degrees.

As the wheels approach each measurement position the cursor ball turns yellow indicating it is time to slow down. When the wheels reach the correct position, the ball turns green, and a red stop sign appears on a green background in the center of the screen. As the measurement for each position is complete, a green box appears around that icon, the icon appears depressed, the status bar turns green, and the red stop sign disappears.

When the desired steering measurements are completed, the software prompts the operator to center and lock the steering wheel before performing any alignment adjustments. After a few seconds the Aligner automatically advances to the alignment readings screens if “Screen Timeouts” has been enabled.

Readings Screen

The Readings screen displays the primary vehicle alignment information in an intuitive, three dimensional format. The screen appears as a vehicle with the body lifted off, viewed from the rear and above.

Review the figure above to become familiar with the screen layout and functions.

Each wheel angle has a numeric reading as well as a graphical meter display indicating directional orientation and relationship to specifications. Camber meters, located along the top of each tire, have a line that indicates camber relative to the preferred specification. Toe meters, projected onto the ground in front of each tire, have an arrow that indicates the toe angle. Caster is represented by a meter in front of each wheel. The numeric value for caster is directly above the meter. When a meter is green, the reading is within specifications. When the arrow is centered within the green it is at the preferred value.

A red meter indicates the reading is out of specification. The red meter contains a green band, indicating the direction of needed change. A gray meter indicates there is no specification for that angle. All numeric readings on this screen are actual live measurements, including caster. If any angles require correction, make sure the brake pedal depressor is engaged and the steering wheel is centered and locked, and then simply begin the adjustment. As the angles change the display will update to reflect the new readings. The numeric values change and the meter indicators move in the direction of change. Click on OK to proceed to the next readings screen.



Fig.2.6

Rear Readings Screen

After the All Readings screen, the Rear Meter Readings screen appears.

This screen display, both in meter and numerical format, the angle measurements and information needed to determine if corrections are necessary.



Fig.2.7

The display is divided into three rows: Camber, Toe and Thrust Angle. The columns represent the left and right side of the vehicle. The Camber and Toe meters have minimum and maximum specifications along the top, a numeric readout of live readings, and a color coding to indicate the relationship of live values to specification. Grey meters indicate no specification has been entered for this angle. Red meters indicate the angle is beyond manufacturer's specification. Green meters indicate live values are within specification. Elevated readings can be viewed by selecting the "Jack" icon located right of the cross values.

Front Meter Readings Screen

The Front Meter Readings screen is similar to the rear. Caster is displayed with the top meters. Camber meters are located in the middle of the screen and toe meters are at the bottom. Caster, camber and toe are "live" displays which can be referenced while making adjustments. When measurements are within specification, the center portion of the meter is green. If red is displayed, the readings are outside of specifications. Grey meters indicate this angle has no specification. Elevated camber and caster readings can be viewed by selecting the "Jack" icon located right of the cross values.

Full Screen

Use arrow key move and choice white color frame, choice ZOOM (F8) to show full screen display of one meter. Click F8 button again, it return full screen display (smaller). Double click any meter, it can be enlarge or become smaller.

Use TAB or Mouse key to click and choice different icons.



Fig.2.8

directory. Custom reports must be created by Crystal Reports* by the user or authorized agent. A custom "BMP" logo can be imported as well.

3 - Set Default Report - Determine the desired report to be used as default and for one click printing.

4 - Zoom - Select this button to enhance the size of the displayed report.

Click OK to continue printing or Cancel to go back to the print menu.

All Readings Screen

After Front Readings the final readings screen is All Readings. This screen shows all alignment readings numerically in a chart format. The numbers are color coded to indicate the reading's relationship to specifications.

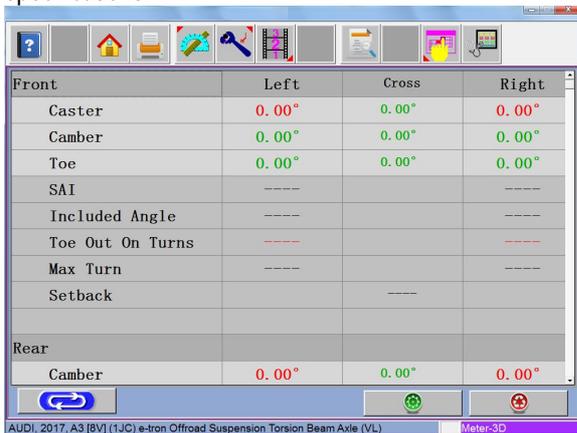


Fig.2.9

A scroll bar on the right side of the screen indicates there is more information below. Click on the down arrow of the scroll bar to reveal Front and Rear Diagnostics values (if measured).

Loop Button

There are four possible "readings" screens – 3-D Readings, Rear, Front, and All Readings. These 4 screens can be "looped" from the All Readings screen. When the All Readings screen is displayed, the 3-D, Rear and Front Readings screens are retrieved by pressing the "Loop" button located at the lower left corner of the screen.

Print Results if you need

Select Print on the toolbar (F4) on either the Front or Rear Readings screen to go to the Printer Menu screen. The options are:

- 1-Select Desired Alignment Report - Select the desired type of report to be printed from the drop down box.
- 2 - Import from a disk - This selection allows a customized report or logo to be imported to the system

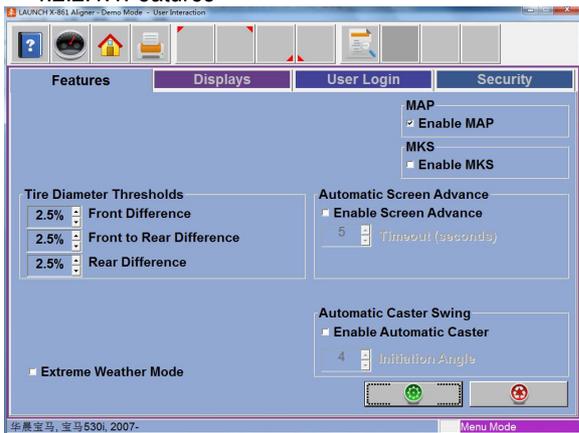
Software Setup

Operator can choose their liked method. Before or after wheel aligning, operator can change data anytime.

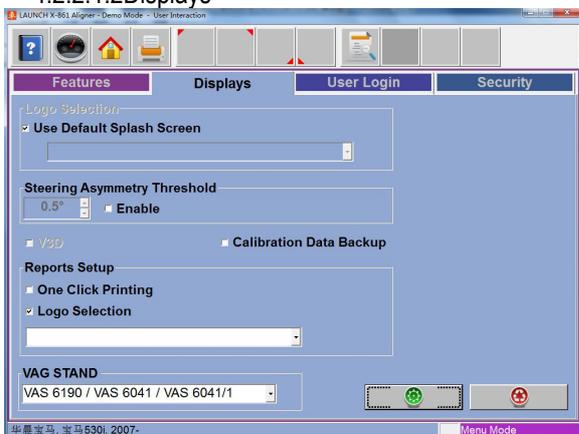


Fig.4.2.2

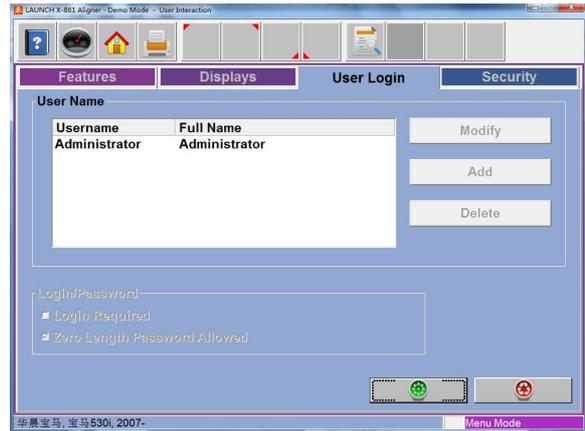
4.2.2.1.1 Features



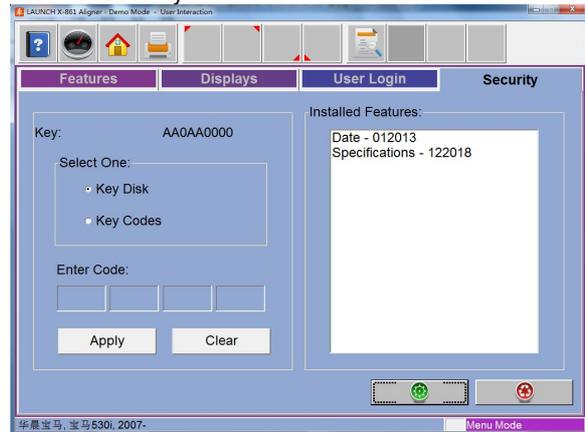
4.2.2.1.2 Displays



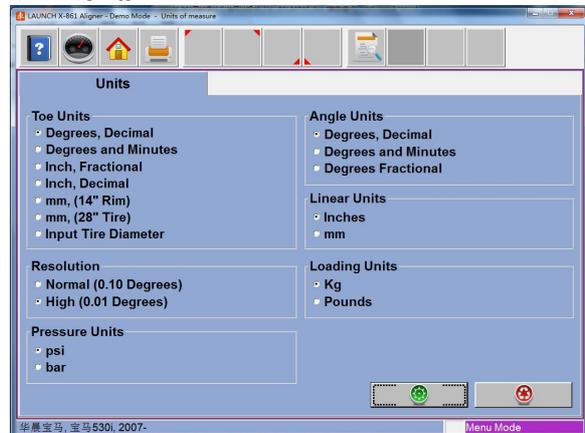
4.2.2.1.3 User Login



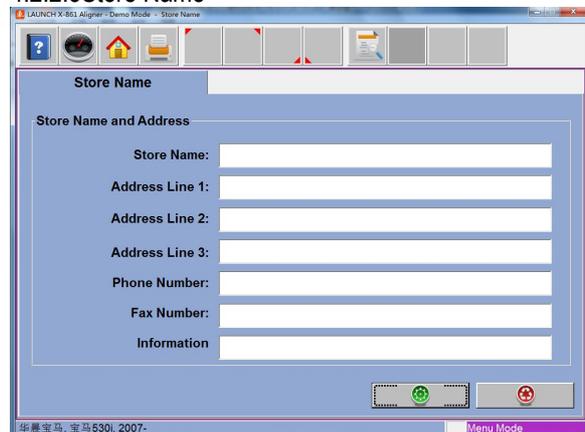
4.2.2.1.4 Security



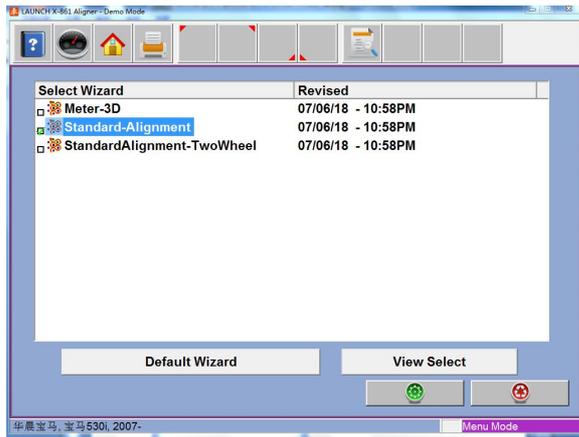
4.2.2.2 Units



4.2.2.3 Store Name



4.2.2.4 Guide



Maintenance Menu

This screen is the hub of user service and maintenance. The Imaging alignment machines are relatively maintenance free when compared to conventional systems. Some routine task may be required form time to time to assure optimum performance. The Maintenance Menu accesses the utilities required for these tasks.

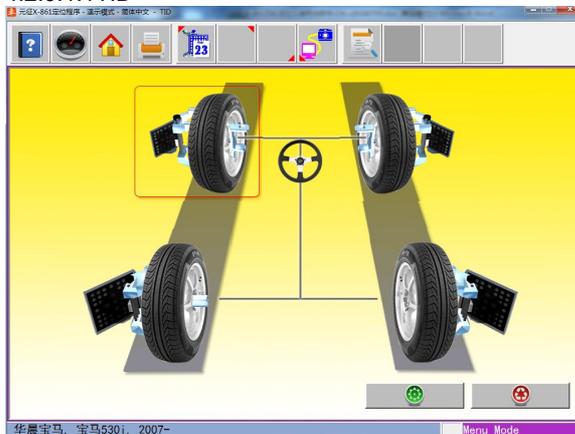


Fig.4.2.3

4.2.3.1 Calibration



4.2.3.1.1 TID



1 Using the arrow keys, move around until the red box is around the target for which ID is to be performed. You can also click on the desired

target with the pointing device.

2. An instruction screen appears asking to place the desired target on the front wheel on the side of the vehicle it is normally on.

3. This insures that the wheel does not move side-to-side during the procedure. If it does move, the software will advise at the end of the procedure that the Target ID has failed and must be repeated.

4. The front wheels of the vehicle must be raised to allow the targets to rotate according to the on-screen instructions. Click OK to proceed.

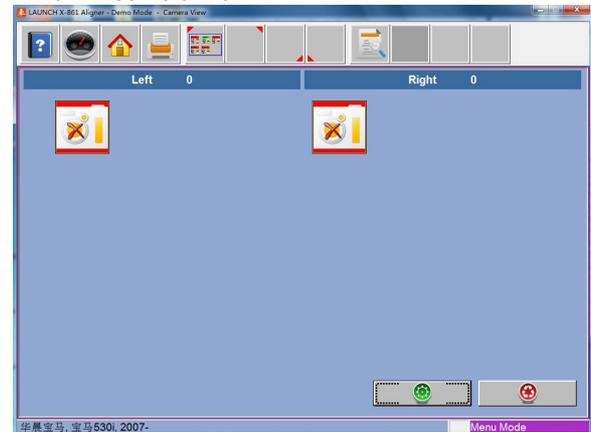
5. Follow the on-screen arrows instructing you to rotate the wheel/target forward (about 30 degrees) until a stop sign appears. Hold steady while the stop sign is displayed until the software takes its readings and automatically advances.

6. Following the on-screen arrows, rotate the wheel/target back (about until the stop sign appears). Hold steady while the stop sign is displayed until the software takes its readings and automatically advances.

7. Follow the on-screen arrows instructing you to rotate the wheel/target forward (about 90 degrees) until a stop sign appears. Hold steady while the stop sign is displayed until the software takes its readings and automatically advances.

8. If this is the last target for the ID procedure, then lower the wheels. If other targets are to be ID'd, do not lower the wheels. Click OK to return to the Target Selection screen. Choose another target to ID if desired. Click the Cancel button to exit the selection screen and return to the Maintenance tab.

4.2.3.1.2 Camera View



Press shortcut key "Ctrl + Alt + T", you can switch the lateral beam Up/Down mode between Manual and Auto. When lateral beam Up/Down mode is switched to Manual, press the key "↑" to raise the lateral beam, and press key "↓" to fall the lateral beam.

4.2.3.1.3 Camera Identification

This is a Service Utilities used in the initial setup of the aligner. It is generally used only once to define the type and number of cameras used on the system. It is a password protected feature and has no user value. (Note: The password is provided by LAUNCH)

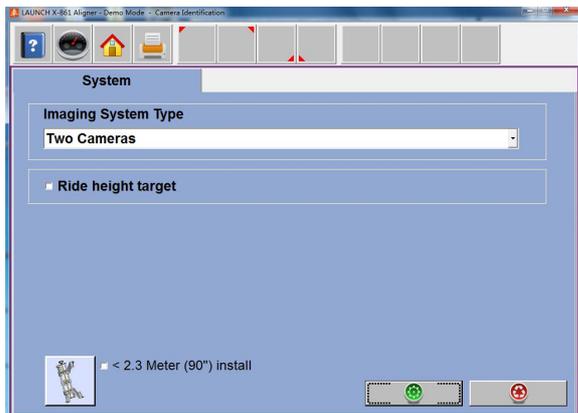


4.2.3.1.5RCP

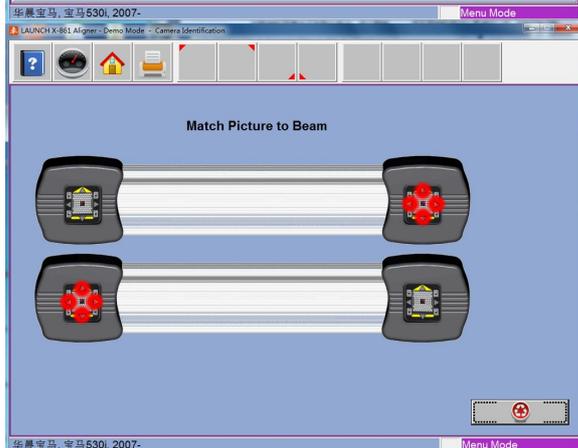
Click the [Camera calibration] icon, the system will enter the interface

Enter the password (Note: The password is provided by LAUNCH), and click [OK] button

1. Step1:Slide the right turntable to position.Place cal bar on the right with the small target on the outside turntable,and the large target towacenter of the rail.



2 Step2:Extend the plunger under the rear foot.

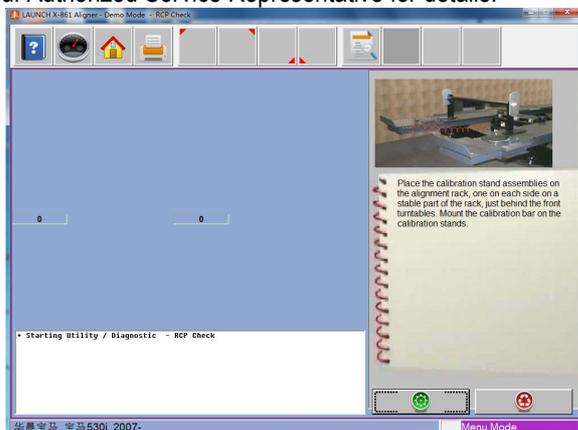


3 Step3:Retract the plunger.Place the cal bar with the small target on the right rail,the large target on the left rail with the feet centered front-to-rear on the turntables .slide the turntables inboard if necessary.

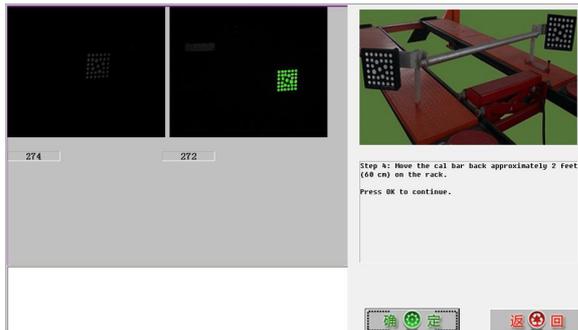
4.2.3.1.4RCP Check

Utility to check the accuracy of the current RCP used by the aligner.

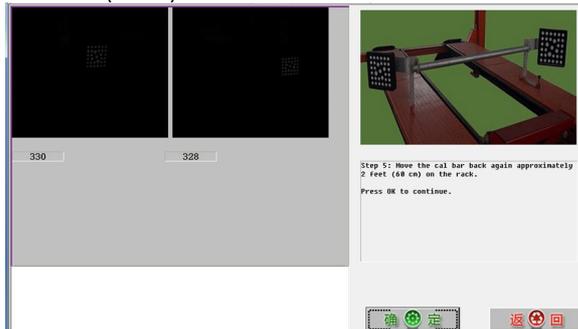
This is a Utility Normally performed by a Service Technician to verify conformance to specification. A calibration fixture is required to perform this task. See your Authorized Service Representative for details.



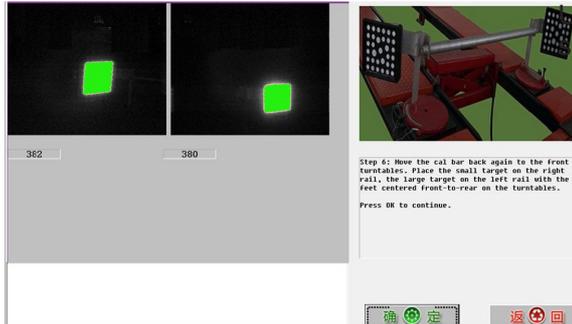
4. Step4:Move the cal bar back approximately 2 feet(60cm) on the rack.



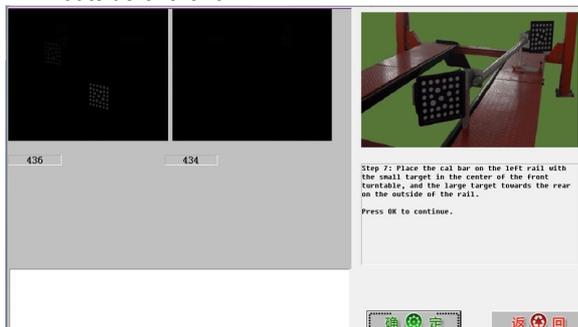
5. Step5: Move the cal bar back again approximately 2 feet(60cm) on the rack.



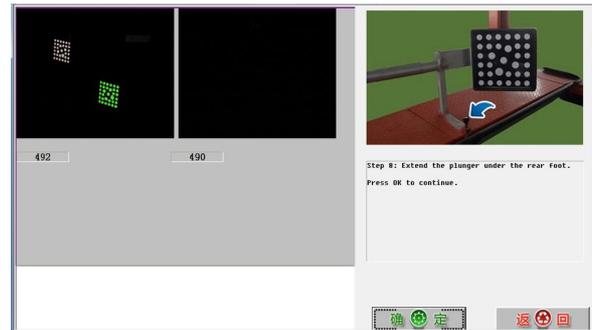
6. Step6: Move the cal bar back again to the front turntables. Place the small target on the right rail, the large target on the left rail with the feet centered front-to-rear on the turntables.



7. Step7: Place the cal bar on the left rail with the small target in the center of the front turntable, and the large target towards the rear on the outside of the rail.



8. Step8: Extend the plunger under the rear foot.



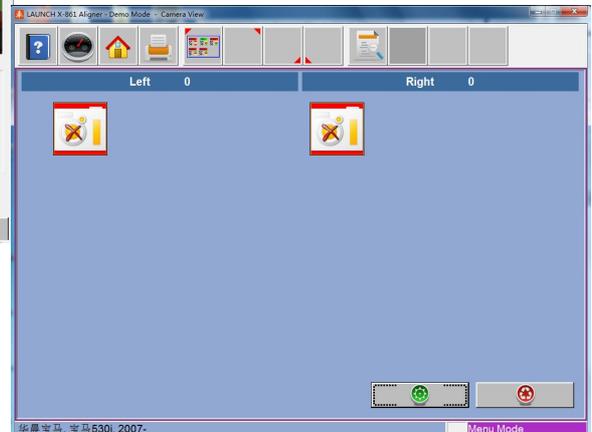
RCP Complete, Exit Calibration.

4.2.3.2Diagnostics



4.2.3.2.1Camera View

Used to acquire raw camera images. This screen shows the view of the targets as seen by the cameras on each side of the vehicle.



4.2.3.2.2Data Examination

RMS

Rms should be less than 0.06. The maximum value is 0.15.

Target Blobs (Blobs)

The target spots (dots) can be identified. The number in brackets is the number of possible dots.

Back Subtract

Counteract background noise.

The wheel aligner is set in automatic mode and cut off in normal way. However, in a very strong workshop, the automatic way will open this function.

Distance (”)

Using inches as a unit shows the distance of the

camera from each target.

Target Angle (°)

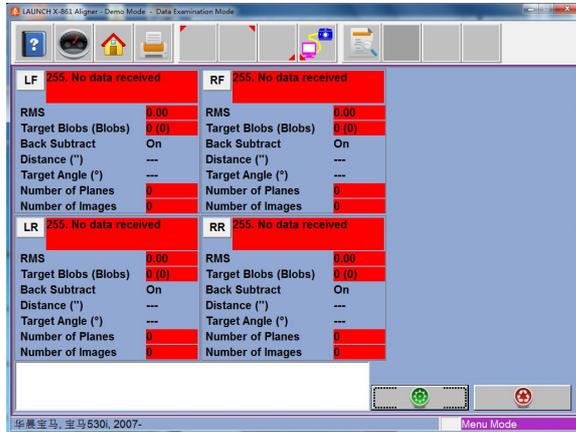
The angle of the target .

Number of Planes

The number of planes obtained by the camera.

Number of Images

The number of original images obtained by the camera.



Frequently Asked Questions (FAQ)

Industrial Computer Cannot Start Up, Without Any Prompts.

- Check the power socket and plug.
- Check the connection. Check the power switches of computer host and monitor. Check the indicator.
- Check the contrast and brightness.

Computer Cannot Enter Windows 7.

- The hardware start files are lost.
- BISO setting error.
- Hardware malfunction.

Mouse and Keyboard does not Respond

- Check the connection of mouse and/or keyboard.
- Check the matching of mouse and/or keyboard to computer host.
- Mouse or keyboard damaged.

Printer does not Respond

- Check connection of printer cables.
- Check printer drive program and settings.
- Check computer virus.

X-861 Program does not Run

- Program file lost or error.
- Program registry list damaged.

Why the blocking tip box does not appear when you turn the steering wheel and block the rear target?

It is normal. The test result will not be influenced without tip box, but please do not block any one of the front targets when you test the extreme point and toe-out on turns.

When you turn the steering wheel, the tip box appears in case of the light path has been blocked, how to handle it?

If the tip box appears among the 20° area, please stop turning the steering wheel, move the blocks away and

then continue to turn the steering wheel.

Why does it have obvious difference between left and right minimum turning radius after alignment?

It is caused by the mistaken position between the steering wheel and the steering column. Alignment in this system is performed in the normal case of Steering Wheel Centered, i.e. it is based on Steering Wheel Centered, so it is necessary to ask the user about the maintenance and use history of the steering wheel, eliminating the interference of the mistaken position between the steering wheel and the steering column, centering the steering wheel according to the experience.

Maintenance

To prolong the service life of the equipment, the user should maintain it with care. The X-861 wheel aligner is of precision equipment which requires periodical maintenance.

Computer

- User should have a basic knowledge about computer software and hardware to insure the normal operation of the computer.
- The computer host and the monitor should be firmly secured on the right positions. Do not put them in a freezing, wet, extremely hot or direct sunlight place, or near the source of radiation and heat.
- Don't foist anything into the computer host and the monitor through the gap.
- Do not switch on/off the computer too frequently.
- Don't change the BIOS setting at will.
- Don't delete the unknown files in the hard disc at will to avoid abnormal computer operation or death.
- The computer is used only for X-861 Wheel Aligner; don't install other software to the Wheel Aligner computer to avoid computer virus. The computer is scanned to ensure it is free of virus before leaving factory.
- Don't use other software to avoid possible virus. LAUNCH warranty does not cover the system problem arising from the virus.
- After a long period of use, the dust and oil dirt will be accumulated on the computer host and the monitor. Please cleanout it with neutral detergent or dehydrated alcohol. Avoid using oil or caustic product.
- Never disassemble the computer and move the inside cables and cards to avoid damage of the inside components.

Wheel Clamp and Target

- The wheel clamp should be cleaned and lubricated timely to insure that the span of claws can be easily adjusted and attached.
- The targets of X-861 wheel aligner are the key components for the alignment measurement, do not damage their structures when using and storing, keep the surface of target clean. Please use the soft cloth dipped with an appropriate amount of the neutral detergent or the absolute alcohol to wipe the surface of target lightly if there are some smuts on it.
- Don't disassemble the targets and clamps to avoid damage of their elements. LAUNCH will not guarantee for this kind of failure.

Printer

- Read the operation instruction of the printer carefully.
- Install suitable printer drive program, and apply right printer setting.
- If the printed words are not clear, it may be that the ink is used out. Please replace the printer ink cartridge in time to resume the printing quality.
- For other printer related problems, please contact the customer service center.

Post, Lateral beam and Signal Cables

- There are two precision CCD cameras inside the lateral beam. The precision position calibration has been performed for the cameras after first installation. The user can not move or wobble the beam equipped with the cameras no matter during or after using it.
- Since computer visual technology is used to recognize the targets mounted on the wheels through the camera with high resolution, it is necessary for X-861 wheel aligner to prevent the outside infrared rays (e.g. sunlight) from directly lighting to the targets and reflecting to the cameras, and it is necessary to avoid blocking the light way from the targets and the cameras for a long time during the instrument is working.
- The wires inside the post and the lateral beam equipped with the cameras are connected compactly. Don't move them after first installation.
- Without approval of the supplier, please do not disassemble the computer host and the lateral beam equipped with the cameras in order to avoid damaging the components, influencing the test accuracy and increasing the costs and difficulties of maintenance and repair. For the damage caused by unauthorized disassembling will not be covered by the Warranty.

Turntables

The mechanical turntables are precision components. Avoid hitting during operation and never splash water on them.

When moving the vehicle on the turntable, please insert the locking pin to avoid the turntable sliding.

Generally speaking, it is not necessary to lubricate the turntables frequently.

Warranty

THIS WARRANTY IS EXPRESSLY LIMITED TO PERSONS WHO PURCHASE LAUNCH PRODUCTS FOR PURPOSES OF RESALE OR USE IN THE ORDINARY COURSE OF THE BUYER'S BUSINESS.

LAUNCH electronic product is warranted against defects in materials and workmanship for 1 year from date of delivery from Launch to the user. This warranty does not cover any part that has been abused, altered, used for a purpose other than for which it was intended, or used in a manner inconsistent with instructions regarding use. The exclusive remedy for any automotive meter found to be defective is repair or replacement, and LAUNCH shall not be liable for any consequential or incidental damages. Final determination of defects shall be made by LAUNCH in accordance with procedures established by LAUNCH. No agent, employee, or representative of LAUNCH has any authority to bind LAUNCH to any affirmation, representation, or warranty concerning LAUNCH automotive meters, except as stated herein.

Banxuegang,
Longgang,
Shenzhen, Guangdong,
P. R. China, 518129

Disclaimer

THE ABOVE WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Order Information

Replaceable and optional parts can be ordered directly from your LAUNCH authorized tool supplier. Your order should include the following information:

1. Quantity
2. Part number
3. Item description

Customer Service

If you have any questions on the operation of the unit, please call: +86-0755-84528767 or 4000666666.

If your unit requires repair service, return it to the manufacturer with a copy of the sales receipt and a note describing the problem. If the unit is determined to be in warranty, it will be repaired or replaced at no charge. If the unit is determined to be out of warranty, it will be repaired for a nominal service charge plus return freight. Send the unit pre-paid to:

Attn: Customer Service Center
Shenzhen Launch Tech. Co., Ltd.
LAUNCH Industrial Park,
North of Wuhe Rd.,