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# Operators Manual

## EEWA717A and EEWA719A Aligner Systems





# Safety Information

For your safety, read this manual thoroughly before operating the equipment.

The 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 product, 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 service methods and perform wheel alignments in an appropriate and acceptable manner that does not endanger your safety, the safety of others in the work area or the equipment or vehicle being serviced.

It is assumed that, prior to using the Aligner, the operator has a thorough understanding of the vehicle systems being serviced. In addition, it is assumed he has a thorough knowledge of the operation and safety features of the alignment rack or lift, and has the proper hand and power tools necessary to perform wheel alignments.

When using your garage equipment, basic safety precautions should always be followed, including:

1. Read all instructions.
2. Care must be taken as burns can occur from touching hot parts.
3. Do not operate equipment with a damaged power cord or if the equipment has been dropped or damaged until it has been examined by a qualified serviceman.
4. Do not let cord hang over edge of table, bench or counter or come in contact with hot manifolds or moving fan blades.
5. If an extension cord is necessary, a cord with a current rating equal to or more than that of the equipment should be used. Cords rated for less than the equipment may overheat. Care should be taken to arrange the cord so that it will not be tripped over or pulled.
6. Always unplug equipment from electrical outlet when not in use. Never use the cord to pull the plug from the outlet. Grasp plug and pull to disconnect.
7. Let equipment cool completely before putting away. Loop cord loosely around equipment when storing.
8. To reduce the risk of fire, do not operate equipment in the vicinity of open containers of flammable liquids, such as gasoline.
9. Adequate ventilation should be provided when working on operating internal combustion engines.
10. Keep hair, loose clothing, fingers, and all parts of body away from moving parts.
11. To reduce the risk of electrical shock, do not use on wet surfaces or expose to rain.
12. Use only as described in this manual. Use only manufacturer's recommended attachments.
13. ALWAYS WEAR SAFETY GLASSES. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses.

**IMPORTANT!! SAVE THESE INSTRUCTIONS  
DO NOT DISCARD!!**

.....  
**Safety Instructions**

**IMPORTANT!! SAVE THESE INSTRUCTIONS**



Risk of electrical shock.

- **Do not operate equipment with a damaged power cord or if the equipment has been dropped or damaged, until it has been examined by a qualified service person.**
- **If an extension cord is necessary, a cord with a current rating equal to or greater than that of the equipment should be used. Cords rated for less current than the equipment can overheat.**
- **Unplug equipment from electrical outlet when not in use. Never use the cord to pull the plug from the outlet. Grasp plug and pull to disconnect.**
- **Do not expose the equipment to rain. Do not use on wet surfaces.**
- **Plug unit into correct power supply.**
- **Do not remove or bypass grounding pin.**

*Contact with high voltages can cause death or serious injury.*



Risk of electrical shock. High voltages are present within the console unit.

- **There are no user serviceable items within the console other than the keyboard and printer.**
- **Service on the unit must be performed by qualified personnel.**
- **Do not open any part of the console other than noted areas.**
- **Turn power switch off and unplug the unit before servicing.**

*Contact with high voltages can cause death or serious injury.*



Risk of eye injury. Debris, dirt, and fluids may drop from vehicles.

- **Knock off any loose debris. Clean surfaces as needed to avoid any materials from falling.**
- **Wear approved safety glasses when servicing.**

*Debris, dirt, and fluids can cause serious eye injury.*



Risk of crushing. Vehicles may roll off alignment lift if not secured.

- **Leave automatic transmission in park or manual transmission in gear unless equipment operation steps require vehicle in neutral.**
- **Apply parking brake unless equipment operation steps require wheel movement.**
- **Use wheel chocks whenever vehicle is positioned on the lift.**
- **Follow rack or lift manufacturer's safety recommendations when lifting a vehicle.**

*Vehicles rolling off lifts can cause death or serious injury.*



Risk of entanglement or crushing. There are moving parts on vehicle lifts during operation.

- **Keep all persons clear of lifts.**
- **Read lift manufacturer's operation instructions carefully.**
- **Follow lift manufacturer's safety recommendations.**

*Contact with moving parts could cause injury.*



Risk of pinching or crushing body parts when jacking vehicles.

- **Keep hands and other body parts away from jacking surfaces.**
- **Do not use unapproved adapters (i.e. wooden blocks) when jacking a vehicle.**
- **Do not bypass any jack manufacturer's safety features.**
- **Read jack manufacturer's operation instructions carefully.**
- **Follow jack manufacturer's safety recommendations.**

*Improperly used or maintained jacks can cause injury.*



Risk of burns.

- **Do not touch hot exhaust systems, manifolds, engines, radiators, etc.**
- **Wear gloves whenever performing a service near hot components.**

*Hot components can cause burns.*



Risk of injury. Tools may break or slip if improperly used or maintained.

- **Use the correct tool for the task.**
- **Frequently inspect, clean, and lubricate (if recommended) all tools.**
- **Follow recommended procedures when performing vehicle services.**

*Tools that break or slip can cause injury.*



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## **Introduction**

The following chapters detail all variations of software features which may or may not be included in all aligner models. This document primarily is designed to cover software navigation and features with minimum regard to the hardware platform in which it resides. There are many variations of aligner models each of which may utilize different features of the base software package.

## **Getting started**

The aligner software offers extraordinary power and versatility. This section of the manual describes how to begin enjoying the many features and benefits. References are often made to other sections of the Operator's Manual.

## **Assembly and Setup**

Installation and setup of a new aligner is best handled by a qualified Representative. If unsure of who to contact, refer to the back page of this manual.

The aligner must be calibrated to at least one rack, lift, or other surface where wheel alignments are to be performed.

All software is loaded onto the computer's hard drive. The Software Discs shipped with the unit contains the alignment software as a backup, and is not needed when performing alignments. All standard alignment features are activated at manufacture. Advanced features when available, are activated as they are purchased with "Activation Codes".

Setups for the PC hardware and Microsoft® Windows® are preset at the factory to maximize performance and should not be altered.

## **Aligner Location**

Locate the aligner in a location that provides the most convenience for the operator. Visual contact with the monitor is necessary during most steps of a wheel alignment.

## **Power ON**

The main power switch for the aligner is located on the rear of the cabinet. This switch applies power to all of the aligner's components except the WAP. Most of the individual electronic components contain a power switch as well. Make sure the monitor's power switch and the computer's power switch (in cabinet drawer) are left in the ON position at all times.

When the power switch is turned on, the unit initiates the computer boot-up. The boot sequence may take several minutes. If any problems are encountered during the boot-up sequence, consult the Maintenance and Service section of this Operator's Manual. The computer will automatically load the alignment software beginning with the logo screen. Click OK to advance to the Home Alignment screen indicating the aligner is ready for operation.

## Aligner Components

### Console

The console houses many of the aligner components including the power supplies, the computer system and provides places for the display monitor, keyboard, and printer. The measurement Pods are stored on the sides of the cabinet when not in use.

The upper shelf of the console provides a location for the display monitor and space for a mouse and keyboard.

The console also houses the computer system and a printer.

**NOTE:** Do not expose the aligner or measuring Pods to water, heavy dust environments, or operations that produce metal chips. Do not block the rear of the computer or disable the cooling fan.

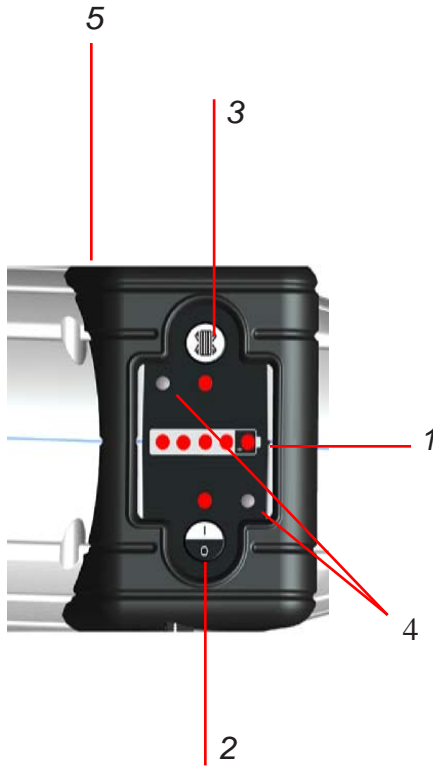
### Computer Connections

Installation of the aligner includes connection of devices to the computer. Care should be taken if there be any reason to examine those connections, or change a component such as the pointing device.

**Note:** Refer to the manuals supplied with the computer and the maintenance chapter for computer connections.

**CAUTION!** THERE ARE NO SERVICEABLE PARTS INSIDE THE COMPUTER. DO NOT ATTEMPT TO OPEN THE COMPUTER CASE FOR ANY REASON. CALL FOR SERVICE IF A COMPUTER PROBLEM IS SUSPECTED.





### Wheel Clamps

Wheel clamps are adjustable to different wheel sizes and types.

Two types of rim claws are supplied, one standard set and a set used for those vehicles with lug mounted wheel covers.

### Measuring Pods

Each Measuring Pod is mounted to a wheel clamp. To attach, make sure the pivot shaft key way is facing up, then insert the shaft into the hole in the clamp center slide. Tighten the Hex Head Cap Screw, then tighten the jam nut to prevent loosening. There are 2 Pods, a right rear and a left rear.

Some functions of the aligner can be controlled from the measuring Pods. Study the keypad to become familiar with the layout of the Pod controls which are:

- 1 Battery condition/Front Runout indicator LEDs
- 2 On/Off
- 3. Runout
- 4. Diagnostics LEDs
- 5. Master reset - not shown

### Aligner Software

Operation from the console is accomplished primarily by a single mouse click to initiate each function. The right mouse button is not utilized within the alignment software.

A standard keyboard is included for data entry. All aligner functions can also be controlled from the keyboard similar to the remote and the measuring Pods. The function keys (F1 - F12) located on the top row of the keyboard have decals that are the equivalent screen icons.

In addition, the keyboard has a "Print Screen" key. When this key is pressed the currently displayed screen will be captured and printed.

1



## Screen Layout and Navigation

The software features a common interface throughout its many screens. Becoming familiar with the various screen navigation functions is essential for efficient use of the aligner.

**1-Toolbar** – these buttons appear on every screen, and correspond to the F1-F12 keys on the keyboard. The functions for F1-F4 are common to every screen, while the functions of F5-F12 vary depending on the screen

2



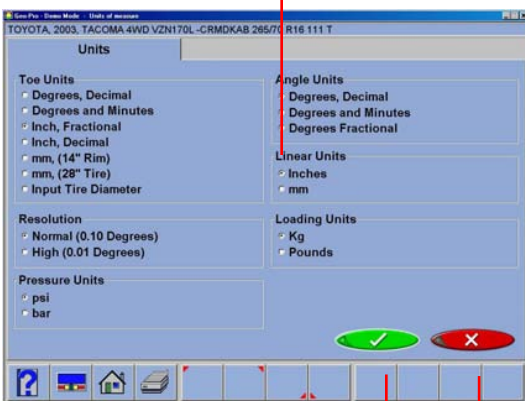
**2-Screen Tabs** – these tabs move to other major areas of aligner operation. Each tab contains a new set of Function Icons to perform functions related to the title on the tab

**3-Status Bar** – contains aligner setup and information on the vehicle selected

**4-Radio Buttons** – enables the selection of one item among a list. Click on the button to the left of the description to enable that function

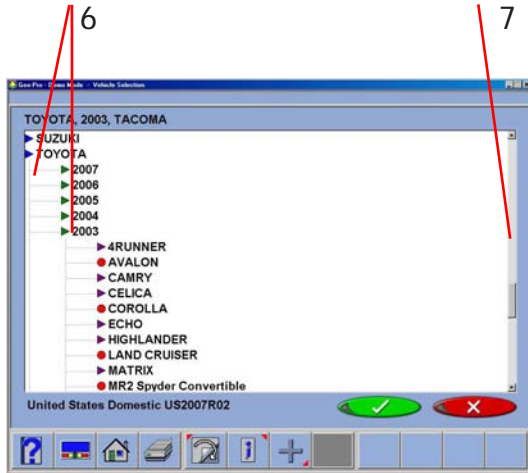
3

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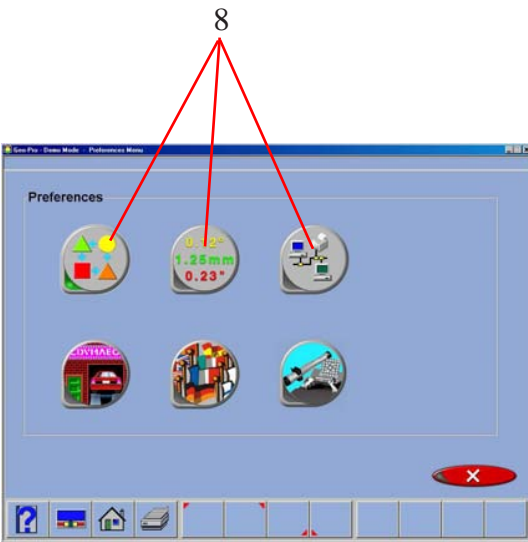


**5-OK and Cancel Buttons** – most screens have these two buttons. **OK** saves the information and/or tells the software the user is ready to move to the next step. **Cancel** leaves the screen, losing the information and/or moving back a step, or possibly skipping the step shown on-screen

5

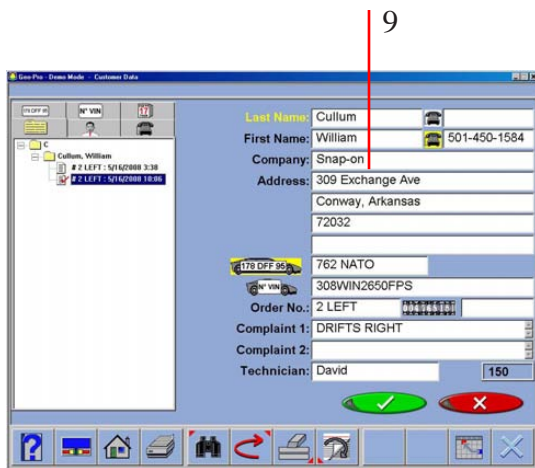


**6-Drill Down Selections** – on the Vehicle Selection screen there are a series of choices with an arrow next to them. To make a manufacturer selection, double-click with the pointing device to expand to the next level. Double-click on the year to further expand for the model selections. To completely contract the selection, double-click on the arrow or name of the manufacturer



**7-Scroll Bars** – when these are present on the screen, either vertical or horizontal, clicking on the arrow moves the screen view in that direction to show additional selections or information. You can also click and hold the center slider and move it up or down to create large movement.

**8-Function Icons** – when the pointer is positioned over any function icon, a text pop-up appears describing its function. When the left mouse button is clicked, this function begins



**9-Text Fields** – some screens have text blocks that allow the user to type information

**Click to Select** – some screens feature columns and rows where a specific action is indicated. To use these, click in the box as desired

## Toolbar Buttons

Toolbars are found on every screen within the software. The following legend identifies the button and refers to the pages where the button's function is described.



**Help** – launches context-sensitive help screens.



**Meters** – jumps directly to the alignment meter screens.



**Home** – jumps directly to the Home Alignment tab.



**Print** – launches the Print Report screen.



**Measure** – from any readings screen, launches the Measure screen.



**Adjust** – from any readings screen, launches the Adjust features.



**Animation** – launches help with performing angle adjustments.



**Zoom** – makes the selected meter fill the entire screen.



**Unzoom** – returns from a zoomed meter to the standard meter screen.



**Custom Specifications** – when selecting a vehicle, brings up any custom vehicles that have been saved.



**Restore OEM** – during editing of specs, returns to OEM values.



**Plus and Minus** – when editing specs, values increase or decrease.



**Delete** – during custom specs, deletes the highlighted record.



**Languages** – allows the on-screen or printout languages to be changed.



**Edit Setup** – allows changing of system setup items



**Information System** – if equipped, calls up vehicle repair information.



**About** - Gives information regarding software revision and options along with copyright statement.



**Logo Screen** - Selecting this button displays the Logo screen for display during idle time.



**Aligner Diagnostics** - Pod values can be observed and analyzed during readings display in the event of concern.



**Find** - During the customer data entry process, selecting this button allows the user to search for an archived file using “Name”, “Phone” or vehicle “License” number.



**Sensor Update** - Occasionally, firmware updates are made available for enhanced Pod operation or addition of features. Select this button to begin the load process.



**Current Record** - Recall the Customer record that is currently stored in memory.



**Clear All Fields** - Select this button to clear all fields within the data file currently open.



**Pod Voltage** - This displays a screen showing values critical for proper cordless operation.



**Recall the Current Alignment** - Displays the current alignment stored values.



**Toggle Editing Mode** - Select this button to toggle the method of editing a displayed specification. A custom specification can be edited by either using the +/- keys or by directly entering desired values.



**Calibration Utilities** - Stored calibration factors can be saved and retrieved. Files containing factors and other data can be saved to a floppy for retrieval or restoring to a machine.



**Setup** - The Preferences Menu is selected from the toolbar icon when a *basic* software package is used as the operating system.



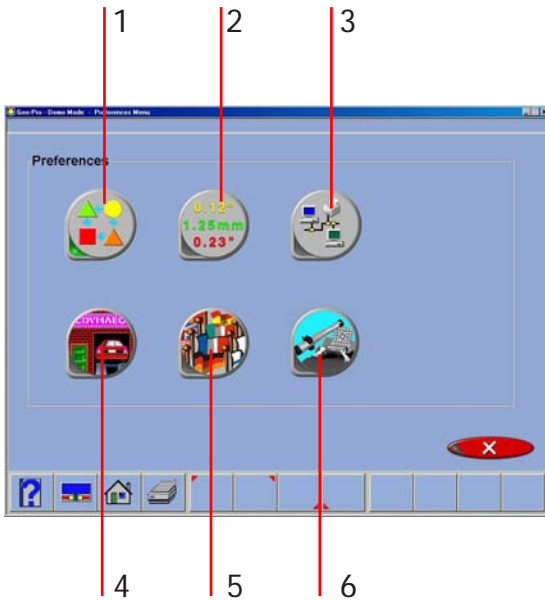
**A-Arm Toggle** - Click to change from adjusting the upper A-Arm to the Lower A-Arm.





## Setup - Preferences

The Preferences Tab is used to setup various functions and features within the software. Numerous operating attributes or “preferences” can be altered to suit the operator’s individual tastes. Although the aligner is shipped with the most common elements selected as default, an operator is able to tailor several elements of the alignment process as well as the display features to customize his machine. Operator preferences can be altered before the alignment process begins or any time thereafter.



## Preferences Screen

The Preference Screen allows access to the following setup selections, each identified by an icon.

**1- Interaction** – controls several functions, which alters interaction between the software and the user

**2- Units** – selects the units to be displayed for angle and linear measurements

**3- Connectivity** – activates access to a shop management networking system

**4- Store Name** – allows a store name and address to be entered for the customer printout

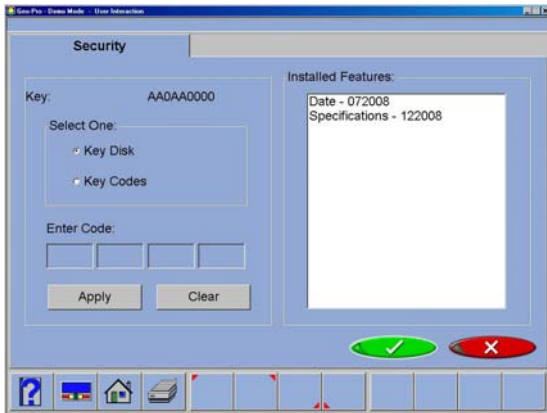
**5- Languages** – selects from various languages for the screen and printout, also selects alignment database

**6 - System** - Selects the desired rack to use

## Interaction

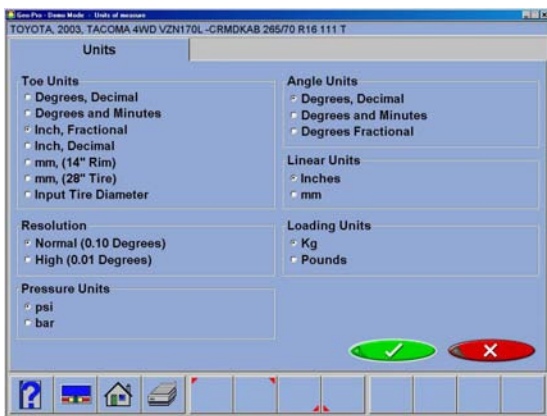
### Security

Security is a utility screen used to activate advanced or optional features. Some software options may be purchased after the initial sale of the Aligner. To activate optional features, an operator or factory representative will be required to obtain “activation codes” which enables software features. Activation codes are unique to one aligner and may not be used on other machines.



### Units

There are many different units of measurement for wheel alignment angles and dimensions depending on local practices, vehicle manufacturer requirements, or operator preference. Choose the Units icon from the Preferences tab. Click on the radio button next to the desired selection of units of measure. Once a prescribed unit of measure has been chosen, all readings and specifications will be stated in those units on all readings screens.



**Toe Units** – move the pointer over the toe units best suited to the operator's requirements and highlight the button left of the desired unit. The choices are, with examples:

- Degrees, Decimal – 0.5 degrees
- Degrees and Minutes – 0' 30"
- Inch Fractional – 1/4"
- Inch Decimal – 0.25"
- mm (14" rim) – European metric display – 20 mm
- mm, (28" tire) – US metric display – 20 mm
- Input tire diameter – prior to bringing up toe specifications during the alignment program, the Aligner will ask for the actual vehicle tire diameter. The toe specs and readings will then be calculated based on that input value.



## Resolution

Use the Resolution selection to choose how numeric displays are to be read during the alignment program. Choices are Normal (0.10 degree or tenths of a degree) or High (0.01 degree or hundredths of a degree) resolution. Regardless of choice it won't effect the accuracy of the aligner, simply the number of digits after the decimal point and the associated roundoff.

The selection will effect the way Alignment readings are viewed. Adjustments using a 0.10 degree resolution will be easier to obtain than when using the 0.01 degree setting. Aligning the car to within hundredths of a degree requires a greater degree of precision on the technician's part to obtain exact readings.

## Angle Units

Specify the units in which all angular measurements will be displayed such as: caster, camber, SAI, included angle, thrust angle, etc.

Examples:

- Degrees, Decimal – 0.5 degrees
- Degrees and Minutes – 0' 30"
- Inch Fractional – 1/4"

## Linear Units

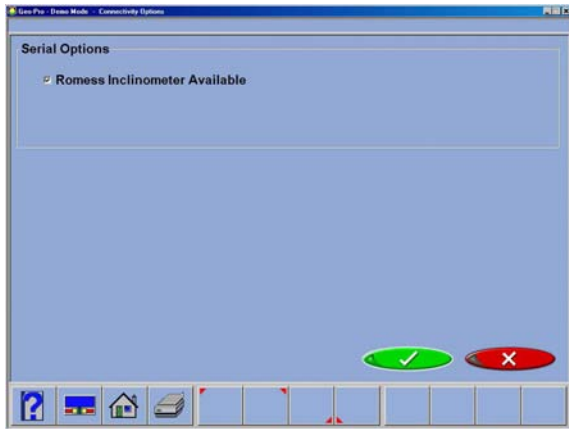
Specify the units in which all linear measurements (setback, vehicle dimensions, etc.) will be displayed.

## Loading Units

Where applicable, values can be expressed in either kg (kilograms) or in lbs. (pounds).

## Pressure Units

Units depicting pressure as in reference to tire pressure can be expressed in psi or in bars.



## Connectivity Options

An interface is available for networking the aligner to a shop management computer system. This interface allows sharing of information between the aligner and a host computer. (Optional software required)

## Romess Inclinometer

This menu is also where the “Romess Inclinometer” is activated for use with certain makes of vehicles, Mercedes Benz for example. **NOTE:** Not available.



## Store Name

Information entered into the Store Name selection will be utilized on the alignment results printout. Several lines of information is available for printing. The name of the business, address, city and state are entered. Also available for display is a phone and fax number if desired.



## Regional Settings

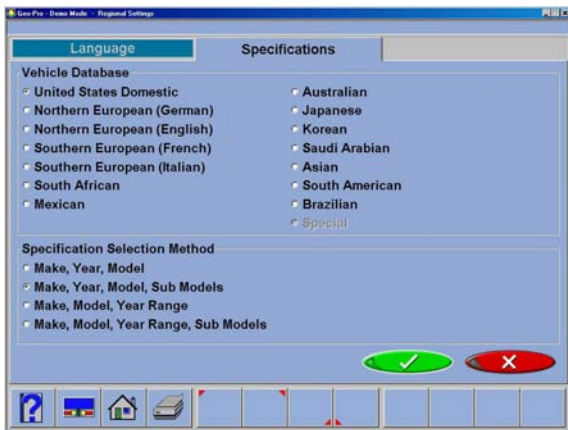
A variety of different languages are available. This feature allows a printout in a language different from the screen operating language. When the Languages icon is selected from the Preferences tab, two additional tab selection screens appear:

**Languages** – selection of screen language

**Specifications** – select from the database of vehicles from a variety of countries or regions.

## Languages

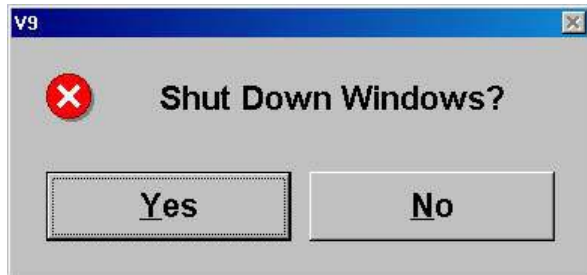
To change the screen language, select from the list using the pointing device, or arrow up/down. To select the Alternate Language, use the pointing device to move to down, click to select. Select “OK” when both screen and alternate languages are highlighted. All screens will now be in the chosen language. English is the first selection on both lists should it become necessary to change the unit back to the default setting. Selecting “Ctrl-Alt-F8” toggles to the Alternate language.



## Specifications

The specification tab allows for changing the spec database to suit the country where the aligner is operated. Also selected is the order in which the make, model, and year appear can be altered.

**Note:** Some automotive markets not specifically identified on this screen have vehicles from a variety of sources. It may be necessary to change databases in order to locate specifications on some vehicles.



## Shutting Down the Computer

***CAUTION! TO AVOID DAMAGING IMPORTANT FILES IT IS NECESSARY TO SHUT DOWN WINDOWS PROPERLY BEFORE TURNING OFF OR RESTARTING THE ALIGNER OR THE COMPUTER.***

Use the following steps to shut down the aligner from within the Alignment software:

1. Return to the Home Alignment screen.
2. Click on the "Shutdown Windows" button located in the lower left corner of the Advanced Main Menu screen and in the tool bar of the Basic Menu screen.
3. Answer "Yes" when prompted, the computer system will then shutdown automatically.

From the Windows desktop:

1. Close any programs or windows that may have been opened.
2. Click the Start button, and then click Shut Down.
3. On the Shut Down Windows box that appears, select "Shut down the computer?" Click "Yes" to proceed.
4. The computer will automatically shutdown, if not, a screen message lets you know when you can safely turn the power off to the aligner.

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### Steps to Performing a 4-Wheel Alignment

There are many reasons why a wheel alignment may be performed on a vehicle such as:

- Accelerated or uneven tire wear
- Pull, wandering, or other steering / handling problems
- After replacement of worn suspension or steering system components
- After-collision repairs
- Routine vehicle maintenance

Regardless of the reasons for alignment, it is important that the technician performs these **Basic** steps necessary to address and correct all problems. Other diagnostics are available for advanced testing.

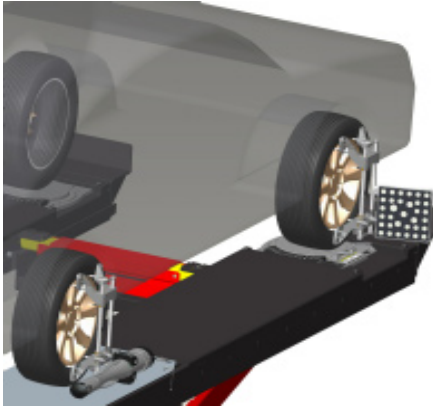
1. Gather information from the vehicle owner – ask about any drivability symptoms of misalignment. Inquire if the vehicle has been in a collision or has had any parts replaced recently.
2. Perform a test drive to verify owner's complaint – try to recreate the problem. If unable to duplicate, have the vehicle owner explain further or have him/her drive with you.
3. Place vehicle on the alignment lift – center the vehicle on the lift and turntables. Raise the lift to a solid, level lock position.
4. Inspect the tires for any signs of abnormal wear – tires often reflect any misalignment conditions.
5. Perform a thorough component inspection. Replace defective parts prior to performing the alignment. Always check tire pressure and ride height.
6. Mount targets and pods to the vehicle wheels. Use the safety straps in the event of grip failure.
7. Perform compensation – the purpose of performing compensation is to eliminate measurement errors due to the wheel runout and clamp mounting error.
8. Determine what needs to be done – Examine the vehicle and any reference materials to determine the procedures for angle corrections. Determine what items are needed to correct any problems (i.e. Aftermarket kits, special tools, etc.).
9. Make any needed angle corrections – center the steering wheel carefully when prompted. Use this order of adjustment:
  - a. Rear camber
  - b. Rear toe
  - c. Front caster
  - d. Front camber
  - e. Front toe
10. Print the results – the printout is useful for showing the customer before and after results. Many shops keep a printout on file for future reference.
11. Perform a test drive to verify proper alignment.

## Positioning the Vehicle on the Lift

Proper vehicle positioning on the alignment lift is an important step for safety and accuracy.

1. Make sure the front turntable and rear slip plate locking pins are in place.

***NOTE: Steps 2 - 5 are recommended to make sure the front tires are placed in the center of the turntables.***



2. Drive the vehicle onto the alignment lift and stop just before the turntables. Take care to insure the vehicle is centered on the runways.
3. Place the vehicle in park (or in gear on a standard transmission), turn the ignition off, and set the parking brake on. Place wheel chocks behind the tires to prevent rolling.

***Failure to use the wheel chocks can allow the vehicle to roll off the rack/lift.***

4. Position the turntables as needed to insure the tires will be centered.
5. Drive the vehicle forward onto the center of the turntables.

***Alternative Method: This method extends turntable life due to relief of load and stresses encountered when the brakes are applied (or acceleration on a FWD vehicle).***

- 5A. Place the vehicle in neutral, release the parking brake, and pull or push the vehicle forward onto the turntables. Reposition the wheel chocks, place the vehicle in park, reapply the parking brake.

***To avoid personal injury or damage to property, follow the rack/lift manufacturer's operating and safety procedures.***

6. Raise the alignment lift to a comfortable working height. This height should be the position where calibration was performed. Lower the lift onto its mechanical stops.
7. Place the transmission in neutral and release the parking brake just before beginning the Wheel Positioning process.

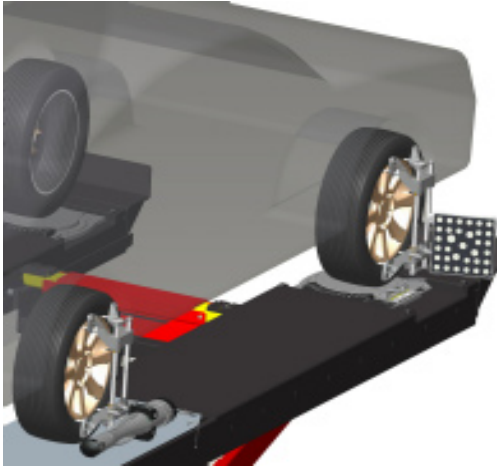


---

## Attach the Targets/Pods

Attach the clamp/target assemblies to the front wheels, with the target reflector surface facing the rear of the vehicle.

The clamps with Pods go on the rear wheels with the long end of the boom to the rear of the vehicle. The Boom optics will need to “See” the adjacent Pod Boom.



There are several methods of attachment depending on the wheel lip configuration. The integrated claws provide the versatility needed to grab virtually any wheel. The claws can be rotated to adjust for different wheel configurations.

***Claws may have sharp edges. To avoid personal injury, use caution when working with wheel clamps.***

The clamps should be installed in a straight-up vertical manner.

Use the mounting method that provides the greatest security to keep the target or pod from falling off the wheel. Most wheels can be grabbed from the outside-in by placing the claws between the bead of the tire and the outside edge of the rim. Use the following steps:

1. Extend the clamp outward to a size larger than the rim by turning the knob counter clockwise.
2. Place the upper claws on the outside of the top of the rim. Push the claws in between the tire bead and the rim. It may be necessary to “pop” the upper clamp bracket with the palm of your hand to seat well. Note that it is not necessary for the clamp to be mounted perfectly vertical on the wheel.
3. Tighten the clamp by turning the knob clockwise until the lower claws engage the rim.

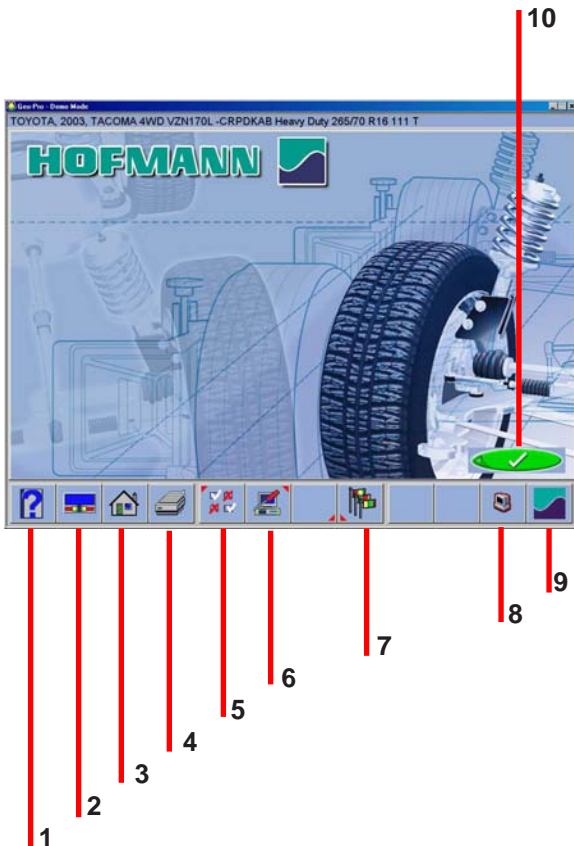
4. Push the lower claws into place. Again, it may be necessary to pop them in further for security. Continue tightening the knob until secure.
5. Test the security by pulling outwards on the clamp. If it comes off easily, reattach the clamp or select an alternative mounting method.

To grab the wheel from the inside out using the outer lip of the rim, use the following steps:

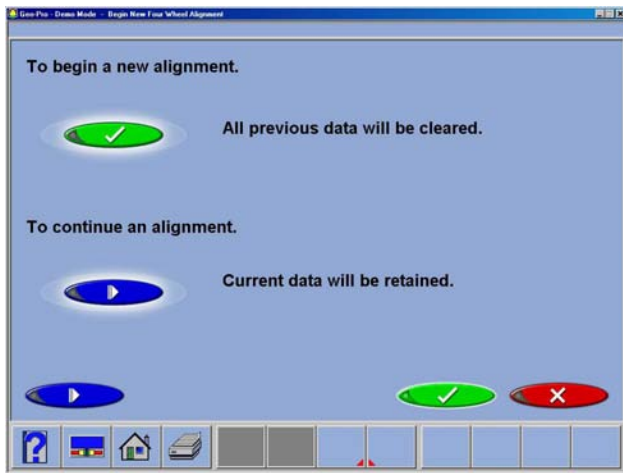
1. Extend the clamp inwards to a size smaller than the rim by turning the knob clockwise.
2. Place the lower claws on the wheel lip at the bottom of the wheel. If a wheel weight is in the way, move the clamp slightly to clear the weight. It is not necessary to be perfectly vertical.
3. Tighten the clamp by turning the knob counter clockwise until the upper claws engage the rim. Continue to tighten until the clamp is secure.
4. Test the security by pulling outwards on the clamp. If it comes off easily, reattach the clamp or select an alternative mounting method.

## Home Alignment Tab

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.



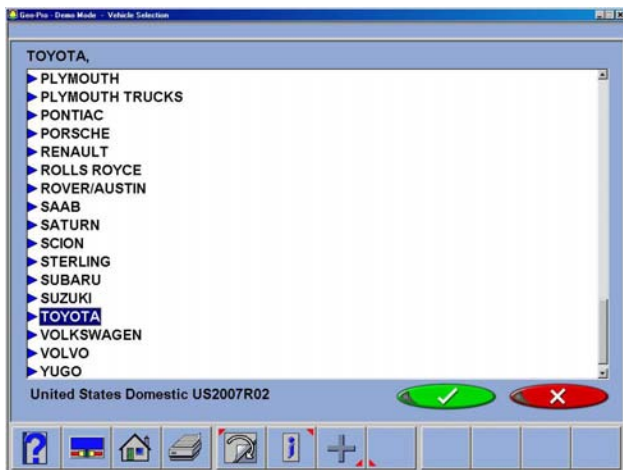
- 1 Help – displays an embedded copy of the operators manual in a PDF format
- 2 Meters - A fast means of displaying readings. If an open alignment is in process the user is directed to the reading screens. If no alignment is currently in memory, the user is directed to perform compensation, then readings are displayed with no reference to specifications.
- 3 Home – returns the software to the opening Home screen as shown here.
- 4 Print – accesses the print report menu
- 5 Preferences – access to various setup parameters to tailor the system to the users tastes.
- 6 Maintenance – Opens the maintenance menu for service and calibration selections.
- 7 Languages – Allows the user to change screen and printed languages.
- 8 System Shutdown - Closes the Aligner Program and properly shuts down the Windows® operating system.
- 9 Software Version Screen - Displays the current versions of software loaded into the Aligner System.
- 10 Begin Alignment - Takes the user to the “Begin Alignment” Screen.



## 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

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

### Vehicle Manufacturer, or Make

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.



.....  
*TIP: To move to the manufacturer selection quicker, using the keyboard, press the first letter of the manufacturer name. This causes the selection bar to move directly to the first name starting with that letter (i.e. press "H" - moves to Honda).*  
 .....

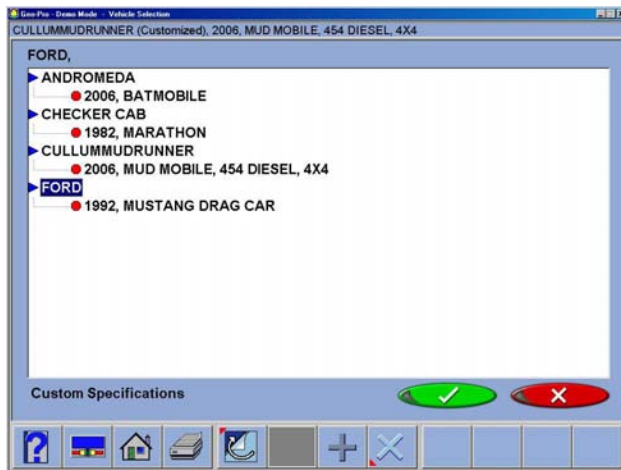
### Vehicle Year

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.



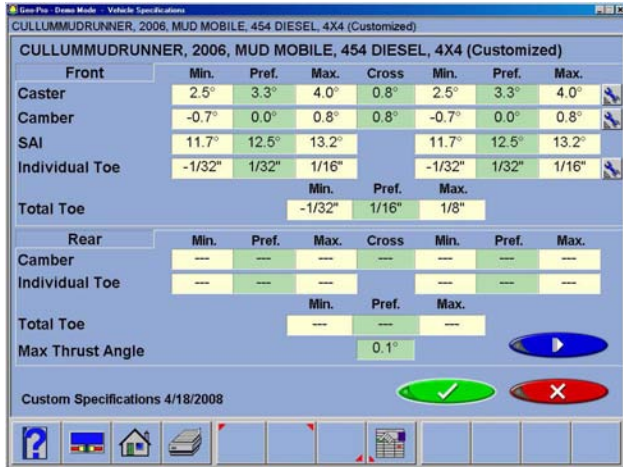
### Vehicle Model

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



### Custom Specifications

Alignment specifications that have been added by the operator reside in a special database. To retrieve these specifications go to the Vehicle Manufacturers screen and select Custom Specifications on the toolbar (F5). Any custom specifications that have been previously added will be listed in a similar manner as the OEM specs. Click on F5 again to return to the OEM specification selection page.



## 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.



## Editing Specifications

To edit the displayed specifications, click on toolbar button F11, Edit Specifications. The toolbar configuration will change, with a plus and minus sign displayed (F6 and F7). Use the pointer to click on the specification to be edited (i.e. left camber). Once it is highlighted, use the plus and minus buttons to change the specification as needed. Notice that when the left value is changed the right value changes at the same time. Use the pointer to move to any other values to be changed. If any mistakes are made, or the user wants to return to manufacturer’s specifications, click on Restore (F11).



When all editing is complete, click on OK. Since these edited specs are now custom, a prompt appears to enter in a description of the new custom specification.



## Adjustment Animations

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 screens. An animation of the adjustment procedure will appear on the screen. Animations can be paused, stopped and restarted at the operators 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.
- **Special Tools**  
The third icon button displays any special tools which may be required to perform the alignment properly.



## 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.

Geo Plus - Drains Made - Customer Data

OFF ID VIN

Cullum, William

2 LEFT: 5/14/2008 3:38

2 LEFT: 5/14/2008 18:26

4178 DFF 95

308WIN2650FPS

Order No.: 2 LEFT

Complaint 1: DRIFTS RIGHT

Complaint 2:

Technician: David 150

✓ X

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

Using the pointing 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.

### 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.

### Adding a New Customer

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.



### **Editing an Existing Record**

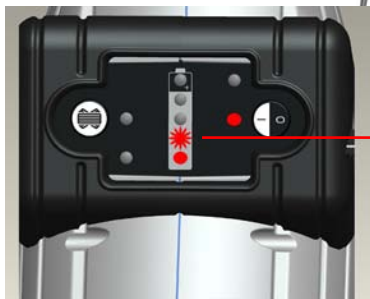
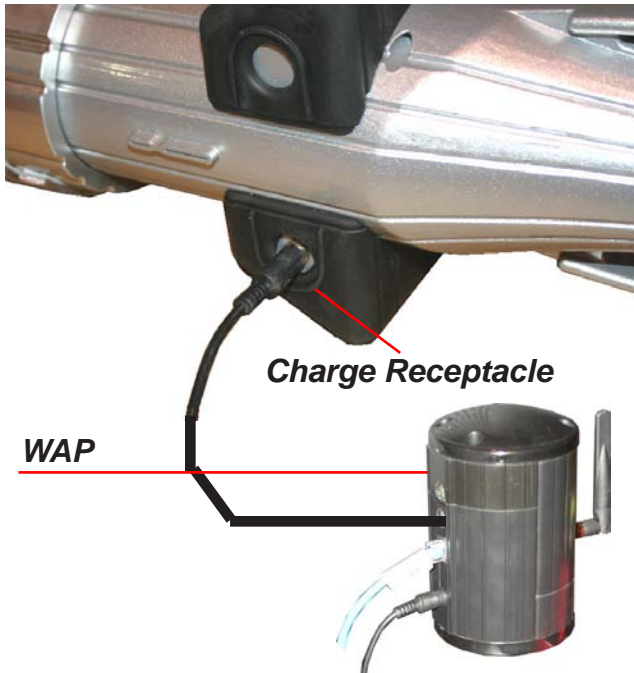
An existing record can be edited by selecting the desired customer record. Once the record is displayed, move between information fields with the pointing device or TAB key. When the “I” bar is within the field to be edited, make the desired corrections. Data is saved when “OK” is entered.

### **Backup and Restore**

Datafiles can be backed-up for security and restored upon demand. The Datafiles are backed up from the Maintenance menu.

### ***Using the Database Outside the Aligner Platform***

The database is stored on the hard drive in a file called AlignmentData.mdb. This database file is compatible with several common database programs such as Microsoft Access (not supplied). See your office computer software representative for information regarding these programs.



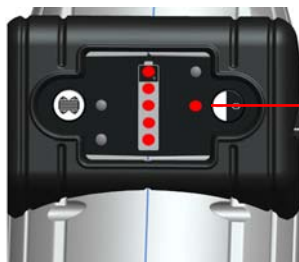
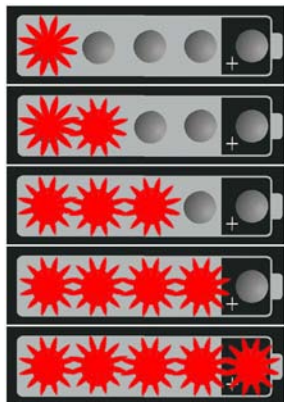
10 to 20%

20 to 40%

40 to 60%

60 to 80%

80 to 100%



**On/Off Button**

## Charging the Pods

The batteries used in the Aligner Pods are long life and do not require charging between alignments. It is recommended to monitor the battery condition LEDs and place them on the charger when below 40% or when only two LEDs are illuminated. In any case always place pods on the charger at the end of the days work and charge overnight.

To charge the Pods insert the charge module connector into the charge receptacle on the side of the Pod, insert the other end of the charge cord into the WAP.

It is OK if the Pods remain connected to the charge cord after receiving a full charge.

The state of charge LEDs will begin flashing indicating the level of charge.

As the Pods are discharged the LEDs will show the amount of remaining charge as shown to the left.

If only one LED is illuminated and flashing, less than 10% power remains indicating the unit must be charged.

## Powering the Pods

Turn Pods *On* by momentarily depressing the On/Off button.

Check battery charge by momentarily clicking the on/off button.

Turn Pods *Off* by pressing and holding the On/Off button for a few seconds until the LEDs go off.

**NOTE: Pods should be turned off when not in use.**

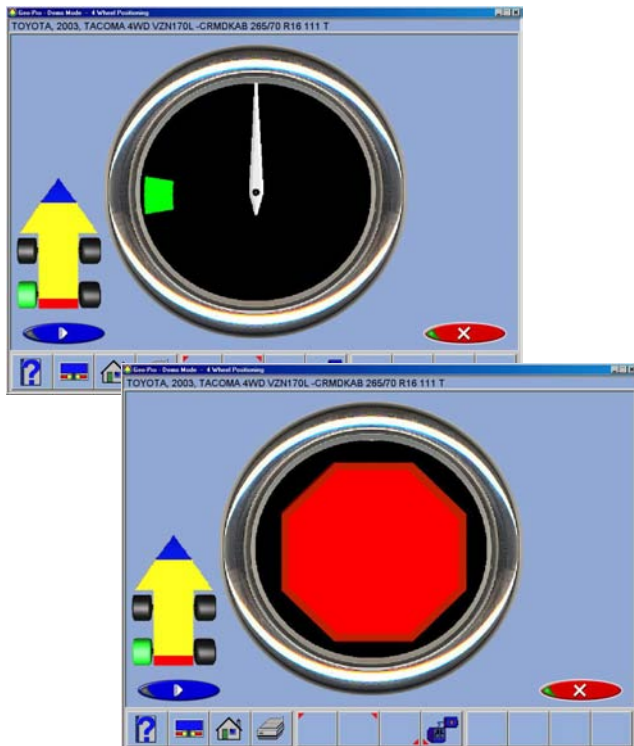
## Runout Compensation

Compensating for the amount of runout of the wheel assemblies is an important factor in the alignment process. If not correctly determined, there may be errors in the displayed camber and toe angles.

The Aligner calculates the plane of the rear wheel assemblies by measuring variations in toe and camber during a four position 360-degree rotation of the wheel.

The left rear wheel compensation is taken 9, 6, 3 and 12 o'clock. The right rear wheel is taken at 3, 6, 9 and 12 o'clock.

Front wheels with targets are compensated by rotating the assemblies forward 25 degrees, then rearward 25 degrees from vertical, then back to the vertical position.



**NOTE:** If the display monitor is not visible for position indication, watch the blinking LED(s) on the Pod during runout. As each of the four positions are initiated, the runout indicator LED begins blinking slowly. The blink will increase in speed as the proper position is approached. The LED will stay on continuous when the proper position is achieved. When runout has been measured, the LED will again begin blinking indicating to the operator to proceed to the next position.

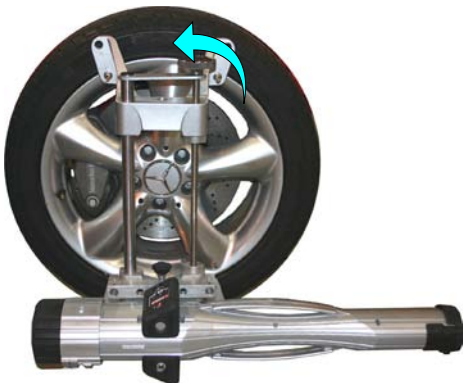
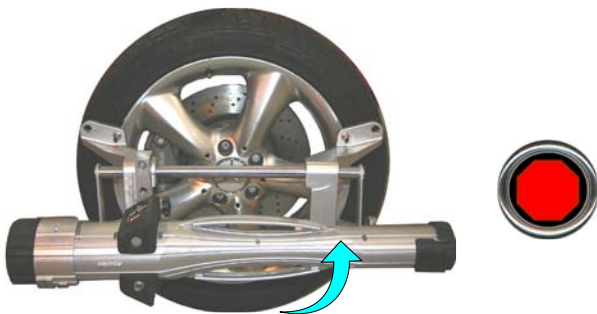
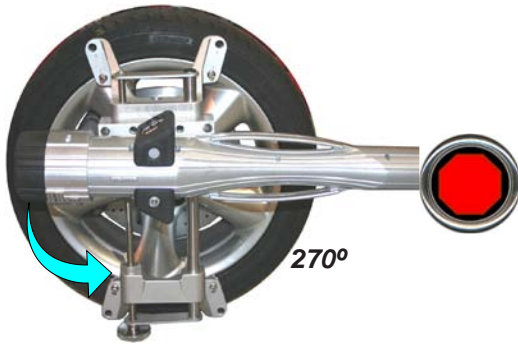
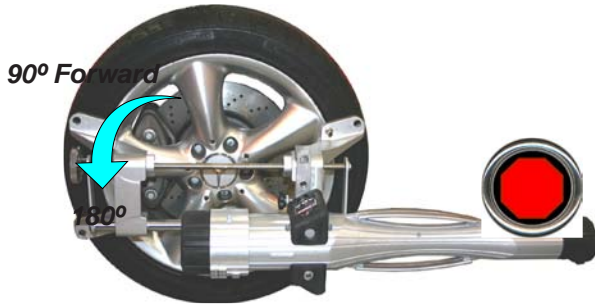
To begin wheel runout compensation, begin by raising the vehicles rear wheels off the alignment rack surface using jacks or other method to allow the wheels to rotate freely.

**NOTE:** Jacks should be rigid and not allow movement during the compensation procedure.

**NOTE:** Runout always begins with the left rear wheel followed by the right rear, then the right front target, the left front target will be last.



LED will flash during Runout



### Left Rear Runout

A. Turn the wheel forward (top of the clamp toward the front of the vehicle) 9 o'clock position or until the runout display on the monitor indicates a "Stop Sign". The runout LED indicator stops flashing and glows continuously when the correct position is attained.



B. Rotate the wheel in the same direction to the 6 o'clock position. The top of the clamp will be down as indicated in the illustration to the left.

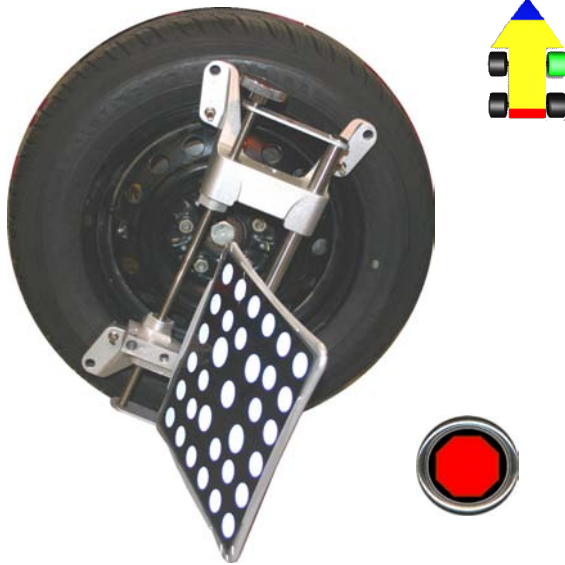
C. Rotate the wheel in the same direction to the 3 o'clock position. The top of the clamp will be to the right as indicated in the illustration to the left.

B. Rotate the wheel in the same direction to the 12 o'clock position. The top of the clamp will be up as indicated in the illustration to the left.

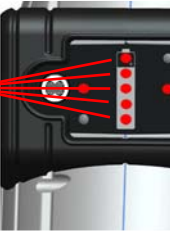
Repeat the above steps for the Right Rear wheel. **NOTE**, the top of the clamp will first be rotated toward the front of the vehicle. The first position will be 3 o'clock, then 6, 9, 12.

Hold steady until prompted  
the next position.

**LEDs will flash  
during Runout**

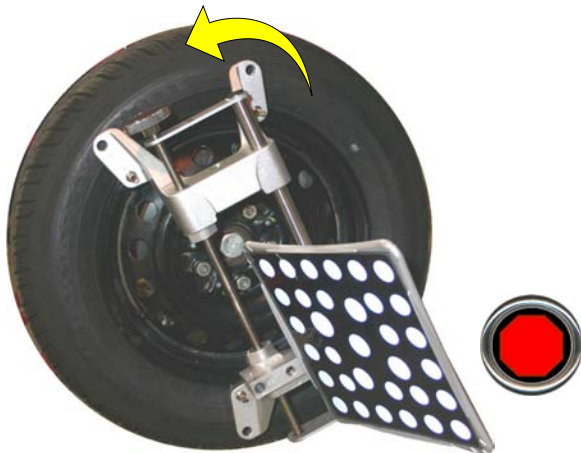


- B. Rotate the [sensor] from vertical to a stop sign. The LEDs will also cease to flash.



- C. After the readings have stabilized, rotate the sensor +/- 25 degrees, return the wheel to the 12 o'clock position until prompted to continue.

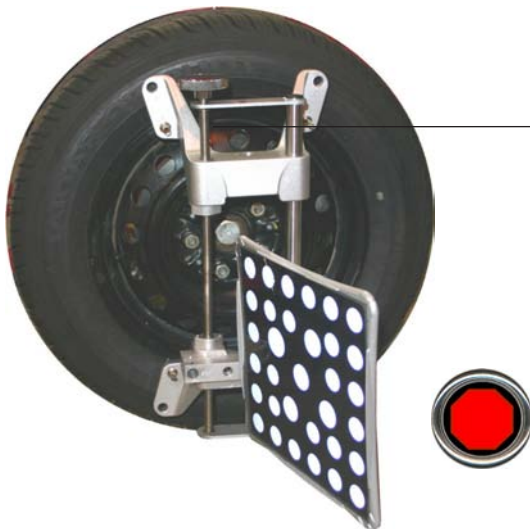
- D. Repeat the above steps on the other side of the vehicle.

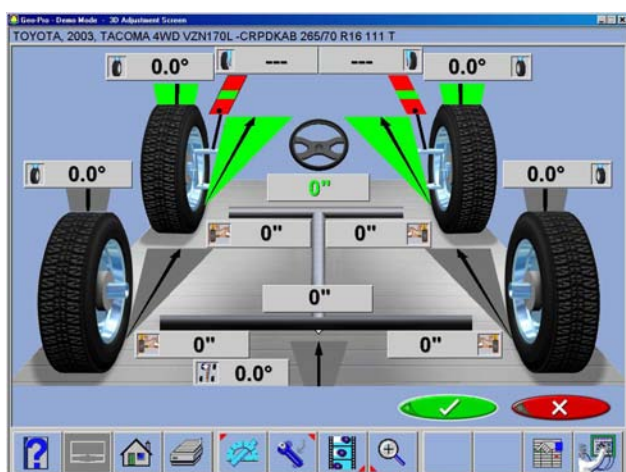
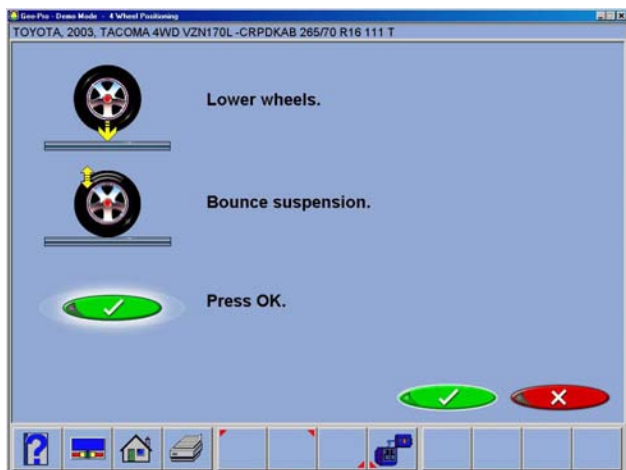


### **Lower Wheels and Bounce Compensation**

The next screen that appears prompts the technician to lower the wheels and settle the suspension so that the vehicle is at a true ride height. Slip jacks are utilized to provide the necessary clearance required to return the vehicle to its normal resting position.

After runout compensation is complete, the technician is prompted to lower the wheels and settle the suspension and press OK to



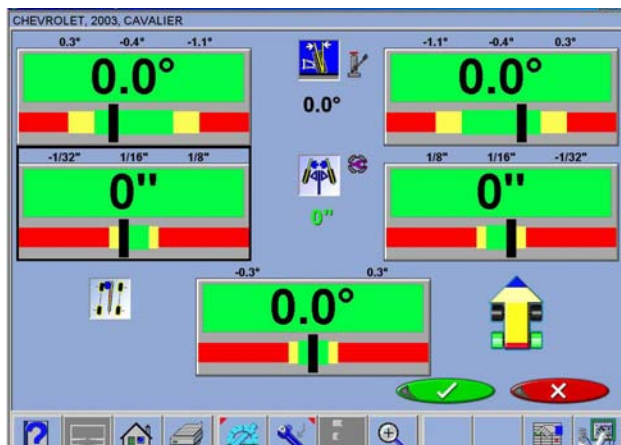


## Readings Screen

The *3D 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 shown 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 after a caster swing is performed. 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, 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.



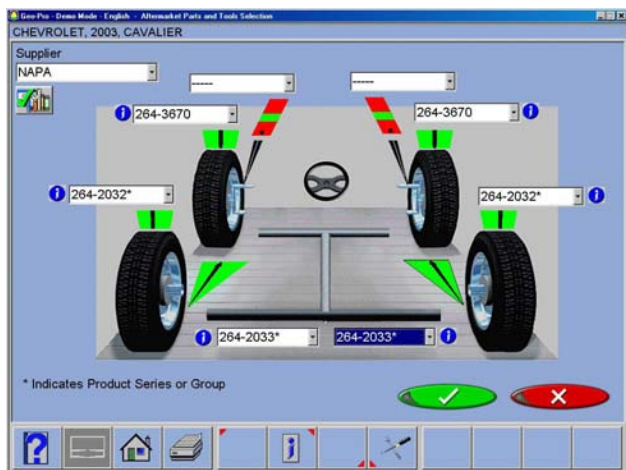
## Rear Readings Screen

After the *All Readings* screen, the *Rear Meter Readings* screen appears. This screen displays, both in meter and numerical format, the angle measurements and information needed to determine if corrections are necessary. 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.

## Readings Toolbar Buttons

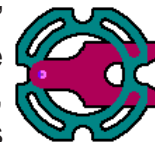
Buttons available on the Readings Screens toolbar from left to right are:

- F1 Help – displays operation assistance for the screen presently open
- F3 Home – returns the software to the opening Home Alignment tab
- F4 Print – accesses the print report menu
- F5 Measure – access to measuring additional angles
- F6 Adjust – access to assistance for the technician with angle corrections
- F7 Animate – assists the technician with illustrations of each angle adjustment. There is a white box around one of the meters that can be moved around the screen using the arrow keys or by clicking on the meter with the pointing device. When the white box is around a particular meter, chose Animate. This runs the adjustment help for that angle.
- F8 Zoom – brings any meter to full screen size to aide viewing
- F11 Edit – allows editing of the vehicle selection, specifications, customer information, and inspections within the current alignment
- F12 Aligner Diagnostics – allows user to observe "camera view" to make sure the targets are in view of the Pod cameras.



## Aftermarket Products

Click the “Aftermarket Products” ICON as shown to activate screens showing available Shims, cams or other aftermarket parts to be used to adjust the vehicle under measure.



### Default Part Vendor

Determine the desired part vendor to select as the default aftermarket supplier. This selection will vary location to location and upon the Technicians preferences.

### INFO

The correct part number is automatically selected and displayed dependant on the vehicle selected and the amount of correction required.

Highlight one of the part numbers displayed, then click on the “Info” ICON to invoke a screen describing the correct orientation of shims or other corrective aftermarket parts. The “Info” ICON can be selected from several places of the screen. If highlighted, information is available.

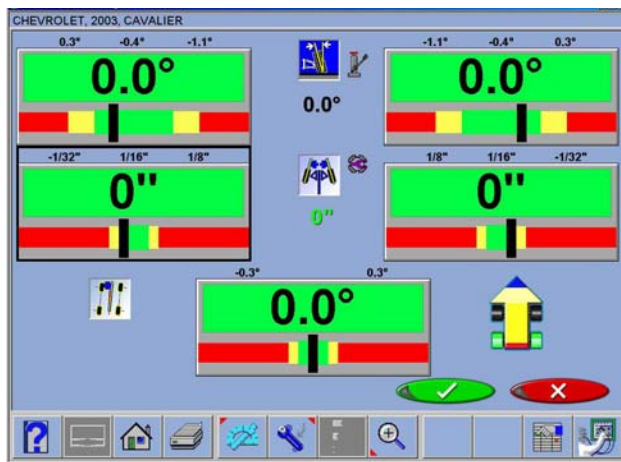
Click the “Aftermarket Tools Available” ICON to view tools required for the specific procedure if available.



## Print Parts Report

Any time the Printer hot-key is highlighted the print parts report can be selected from the scroll down menu. All parts highlighted in the Shim screen will be shown as used for the alignment. Be sure to deselect any of those not used if to be provided to the customer.





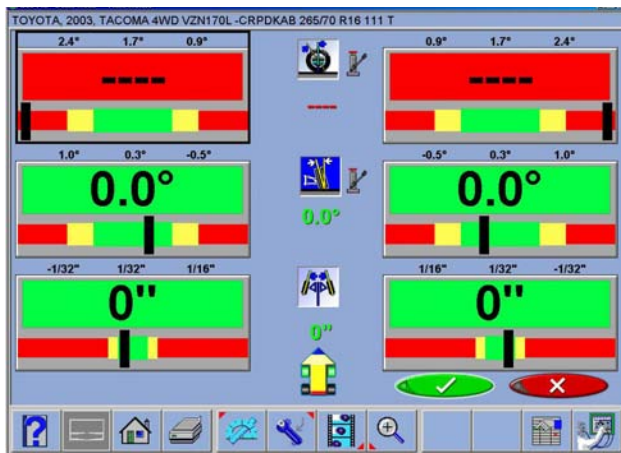
## Cross Values / Total Toe

The numeric value between the camber meters indicates cross values (side-to-side), the difference between left and right readings. This cross value is important on many vehicles for proper handling. The numeric value between the left and right toe meters indicates the rear Total Toe (sum of individual toe).



## Level and Lock Steering Wheel

Before front readings are displayed it is necessary to level the steering wheel and lock it in place using the steering wheel holder. Once these steps are completed, press "OK" to move forward.



## Front Meter Readings Screen

The *Front Meter Readings* screen is similar to the *Rear Readings* screen.

Caster is displayed with the top meters.

Camber meters are located in the middle.

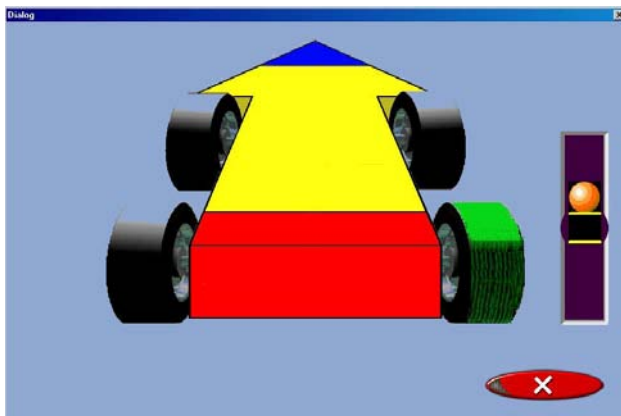
Toe meters are at the bottom.

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.

NOTE: Front Readings Toolbar buttons are explained in the “Rear Readings” section.

NOTE: If a screen or “Dialog box” appears like the screen shown to the left, one or more of the pods require leveling.



Geo-Pac - Drive Mode - All Readings Screen  
 TOYOTA, 2003, TACOMA 4WD VZN170L -CRPKAB 265/70 R16 111 T

Front	Left	Cross	Right
Caster	---	---	---
Camber	0.0°	0.0°	0.0°
Toe	0"	0"	0"
SAI	---	---	---
Included Angle	---	---	---
Toe Out On Turns	---	---	---
Max Turn	---	---	---
Setback		0.0"	
Rear			
Camber	0.0°	0.0°	0.0°
Toe	0"	0"	0"
Thrust Angle		0.0°	

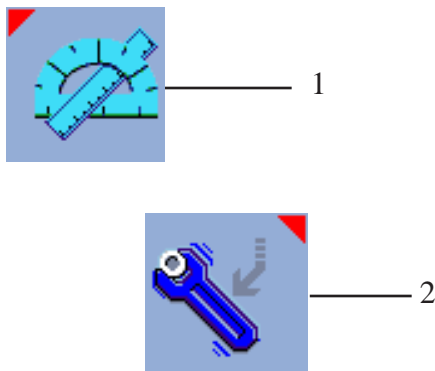
Navigation buttons: Home, Print, Measure, Adjust, Loop, OK, Cancel

## All Readings Screen

After *Front Readings* the final readings screen is called *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.

NOTE: Pressing "OK" on this screen saves the alignment if Customer information has been entered. The process is then prompted back to the Main Screen where the alignment can be resumed or a new alignment can begin.

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).



After readings have been observed, other measurements or adjustments may be required for completion of the alignment process. Determine additional measurements (1) or adjustments,(2) or select other features to complete the process.

Other features are:

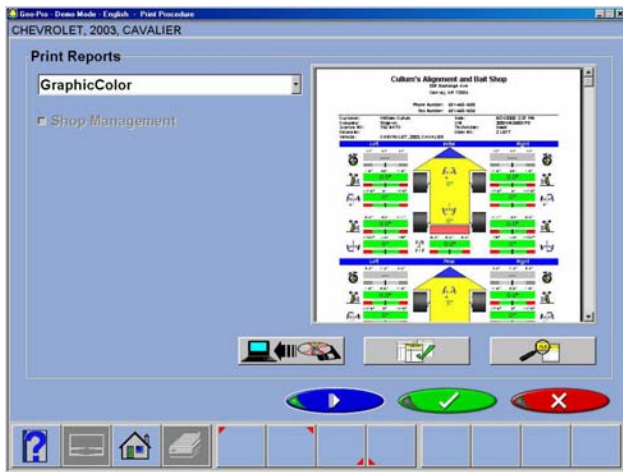
- Return to Home**
- Print Results**
- Measure**
- Adjust**

- or -

### 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

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

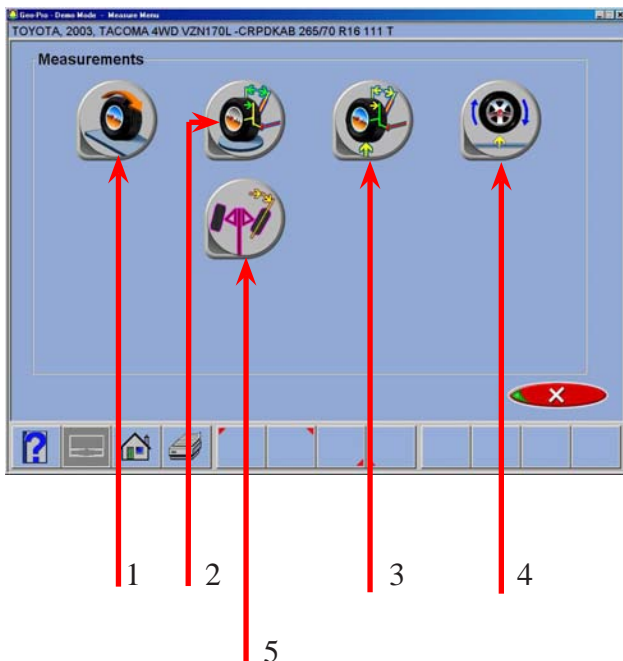
**2 - Import from a disk** - This selection allows a customized report or logo to be imported to the system directory. Custom reports must be created by Crystal Reports\* by the user or authorized agent. A custom "BMP" logo can be imported as well.

**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.

## Measurement Menu

When the Measure icon is selected from the Home Screen or from the toolbar on any readings screen, a screen appears that allows the operator to measure any wheel alignment angle. The icons on this screen are defined in, and are explained below:



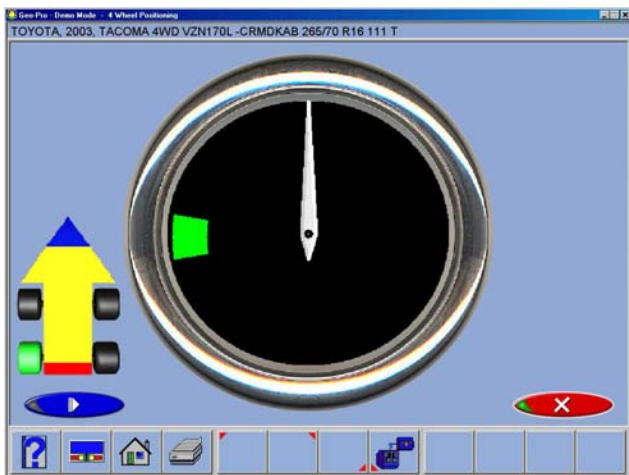
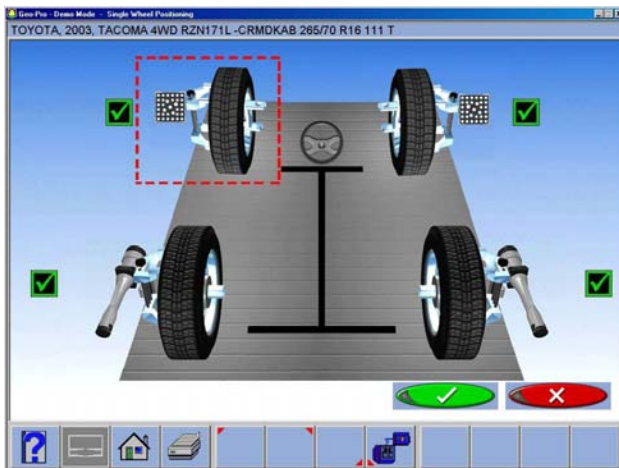
**1. 4 Wheel Positioning** – repeats the Runout Compensation process that locates the vehicle spindles.

**2. Measure Caster/SAI on Turn Plates** – accesses the steering angles measurement screen used to measure caster, SAI,

**3. Measure Caster/SAI Elevated** – measure the Caster and SAI angles with the wheels elevated (unloaded)

**4. Single Wheel Positioning** – instead of the normal compensation sequence, the vehicle can be jacked to allow each wheel to be compensated independently. This is useful if a wheel must be removed during the alignment, for example to install a shim in the rear.

**5. Maximum Turns** is selected to measure the amount of steering angle to the right and to the left.

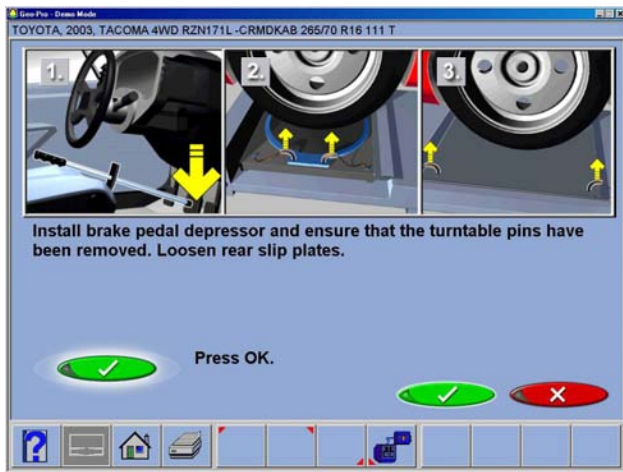


## Single Wheel Positioning

The vehicle can be jacked to allow each wheel to be compensated independently. This is useful if a wheel must be removed during the alignment, for example to install a shim in the rear. The *Single Wheel Positioning* procedure locates each wheel's axis of rotation by jacking the vehicle and moving each pod and target.

1. Select *Single Wheel Positioning* from the Measure screen. The screen shows the vehicle's 4 wheels with a red box around the left front wheel. If a check appears in the box, it indicates that the wheel has been previously successfully positioned. Use the up/down arrow keys or mouse to place the box around the wheel to be positioned and press/click OK. You can also double-click on the desired wheel.
2. Raise the front or rear axle being positioned as instructed. Notice that VODI, shows which wheel has been selected.
3. Following the on-screen graphics, rotate the pod or target back approximately as directed by the indicator.
4. When complete, an instruction screen appears reminding you to lower the vehicle. This is only necessary when all wheels that need to be positioned individually have been done. It is acceptable to leave the vehicle elevated if additional wheels require compensating. Lower the vehicle and jounce the suspension prior to returning to any readings screen.
5. As each wheel compensation is completed the software returns to the selection screen and a check mark appears next to the wheels that have been successfully positioned. Click on the Cancel button once all wheels are compensated to return to the alignment readings screens.

**NOTE:** See pages 33-35 for more information on wheel runout compensation.



## Measuring Steering Angles

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

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.

The icons indicate the steering positions for measuring caster and steering axis inclination (SAI) simultaneously, toe-out-on-turns (TOOT), and maximum steering angle.



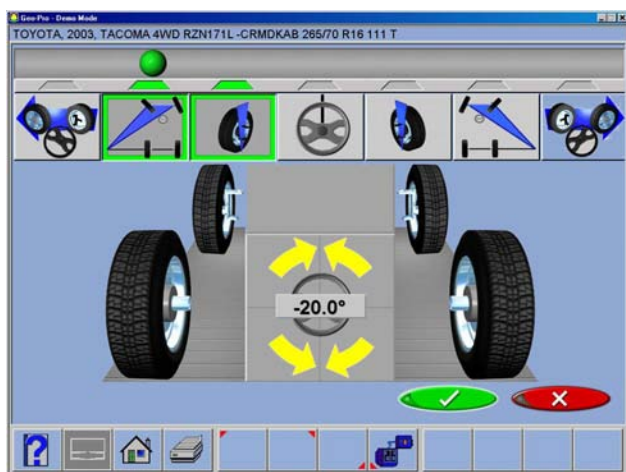
## Measuring Steering Angles

Begin the measurement of steering angles by selecting the desired method of measuring Caster and SAI, such as on the turn plates or elevated. The process is basically the same for both except for elevation.



## Measuring Caster and SAI

1. The status bar is positioned above the Caster/SAI icon first. The cursor ball turns from red to yellow as the angle approaches 10°. At approximately 10° the ball turns green.
2. When the steering angle reaches 10°, a red stop sign appears above the steering wheel, hold steady for a few seconds. A green box appears around the Caster/SAI icon, the icon appears depressed, the status bar turns green, and the stop sign disappears when the measurement is complete.
3. If only caster/SAI is desired, turn the wheel the opposite direction. The software senses this action and places a red status bar above the caster/SAI icon on the opposite side. Follow the arrows to a 10° turn on that side. A stop sign appears at the proper spot – hold the wheel steady.
4. When the green box and depressed icon appears the measurement on that side is complete. The software then places a red bar above the center steering icon.
5. Follow the arrow to the center until the stop sign appears, making sure the number displayed on the steering wheel in the center of the screen is between -0.2 and +0.2. Wait for the alignment readings screens to appear. Caster values are displayed on the *All Readings* screen and the *Front Meters* screen, while SAI is displayed only on the *All Readings* screen.



## Toe-Out-on-Turns (TOOT)

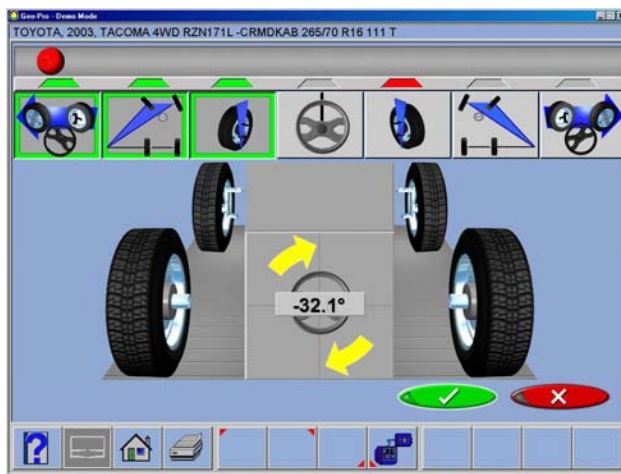
Toe-out-on-turns is another diagnostic measurement that is valuable in troubleshooting steering and handling problems.

**TOOT** or Turning Radius, as it is also known, is the difference in the turning angle between the inside and the outside wheel.

**NOTE: The Aligner vehicle database does not contain specifications for toe-out-on-turns. Refer to an alignment specification book or the vehicle's shop manual.**

1. After completing the Caster/SAI measurement on one side, continue to turn the wheel past 10°. The software senses this and places a red status bar over the TOOT icon.
2. Follow the arrow to a 20° turn. Once again, the cursor ball turns from red to yellow to green as the angle is approached.
3. When the stop sign appears, hold the wheel steady until the green box/depressed icon appears and the stop sign disappears, indicating completion of the measurement.
4. To measure toe-out-on-turns on the other side, turn the wheel the opposite direction. Note that the status bar appears over the caster/SAI icon first. It is always required to measure caster/SAI before TOOT.
5. Turn to the Caster/SAI position. When completed, the red status bar appears over the toe-out-on-turns icon. Continue the turn to the TOOT position.
6. When complete, the software then places a red bar over the center steering icon. Follow the arrow to the center until the stop sign appears, making sure the number displayed on the steering wheel in the center of the screen is between -0.2 and +0.2. Then step out of the way so targets and pods see each other, and wait for the alignment readings screen to appear. To view toe-out-on-turns values, advance to the *All Readings* screen.



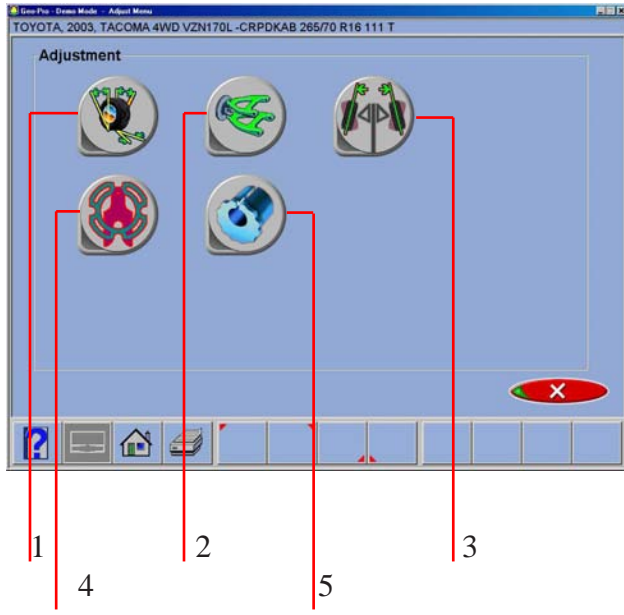


## Maximum Turn Angle (Lock to Lock)

This routine is very similar to the Toe-Out-On-Turns feature. It allows the measurement of the “full lock” or maximum turn in each direction. Consult an alignment specification manual or shop service manual for manufacturers specifications for the maximum turn reference angle and the outside turn value.

1. After completing the caster/SAI and toe-out-on-turns measurements on one side, continue to turn the wheel past 20°. The software senses this and places a red status bar over the maximum turns icon.
2. Continue turning the wheel as far as it will go to the full lock position on this side. Hold steady until the green box/depressed icon appears and the stop sign disappears, indicating the measurement is completed.
3. To measure maximum turn angle on the other side, begin to turn the wheel the opposite direction. Note that the status bar appears over the caster/SAI icon first. It is always required to measure caster/SAI, then toe-out-on-turns before maximum turn angle.
4. Perform caster steps and toe-out-on-turns steps, then continue turning out to measure at full steering lock.
5. Hold steady until the green box / depressed icon appears indicating the maximum turn angle measurement is completed.
6. The software then places a red bar over the center steering icon. Follow the arrow to the center until the stop sign appears.

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.



## Adjust Menu

One of the most powerful features of the Aligner is the assistance given to the technician when performing adjustments on a vehicle. These features are on the Adjust screen, and are accessed through the Adjust icon, located on the Home Alignment screen, *and*, from the Adjust button on the toolbar when alignment readings are displayed.

The features are designed to improve the efficiency and effectivity of the alignment technician. Icon choices are from the Adjust screen are explained below:

**1 - Adjust Caster and/or Camber** – several different options are available to assist with these angles, including elevated adjustment, adjustment on turn plates, and adjustments that include toe angles.

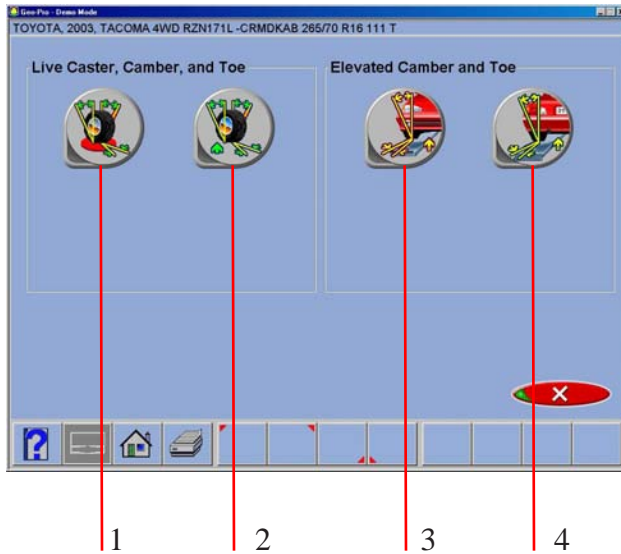
**2 - Adjust A-Arms** – for vehicles whose caster and camber adjustments are located on the suspension A-Arm, this selection allows both angles to be corrected simultaneously.

**3 - EZ Toe** – this software routine is a method of setting front toe, making it easier to obtain straight steering wheels.

**4 - Rear Shims and Kits** – many front wheel drive cars use a shim on the rear axle/spindle to adjust camber and/or toe. This program determines the proper shim to use.

**5 - Offset Cam Bushing** – used on many 2 and 4 wheel drive trucks to calculate proper size and orientation of offset bushing or sleeve.

Detailed instructions for each of these five adjustment procedures are explained:



## Adjust Caster and/or Camber

When this icon is chosen, another screen appears giving choices on different modes for adjusting these angles. The icon chosen will depend on the type of adjustment being made and is determined by the operator.

The screen icon choices are defined and explained briefly below:

### 1 - Caster, Camber and Toe Adjust on Turntables

- this mode is used for adjusting Caster, Camber and Toe on the front wheels while resting on the turntables.

### 2 - Caster, Camber and Toe Adjust, Elevated

- this mode is used for adjusting Caster, Camber and Toe on the front wheels. The readings on the turntables are retained even though the wheels are elevated.

### 3 - Adjust Front Camber and Toe Only Elevated

this mode is used for adjusting only camber and toe on the front wheels. The readings on the turntables are retained even though the wheels are elevated. It is not required to have a valid caster value entered.

### 4 - Adjust Rear Camber, Toe Elevated

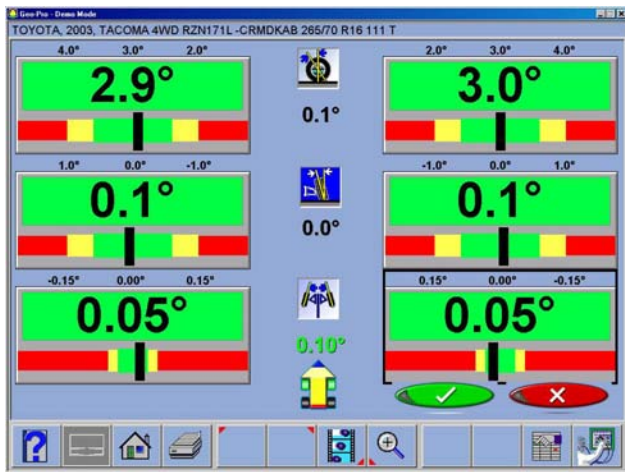
- Same as above but performed on a rear axle.



### Procedure: Adjust Caster, Camber Toe on turntables.

After selecting this icon, instructions appear in preparation for the adjustment.

- Bounce the suspension
- Install brake pedal depressor
- Press OK



When OK is pressed, a screen very similar to the standard Front Readings display appears.

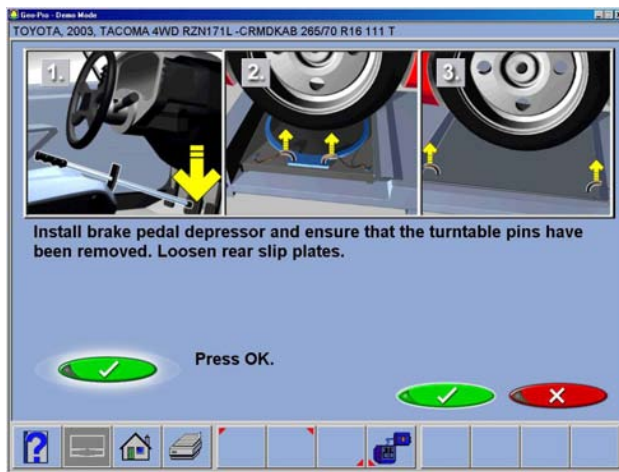
Adjust caster and camber while viewing this screen – for example, camber and caster change will be shown as an eccentric cam is turned. As the adjustments are made, the meter movements and numeric values change. The meters are color coded to show the readings' relationship to specification.

Once the adjustments are completed, press OK. Post-adjustment instructions will be displayed:

- Unlock the brakes
- Press OK

The software automatically returns to the readings screen where you started.

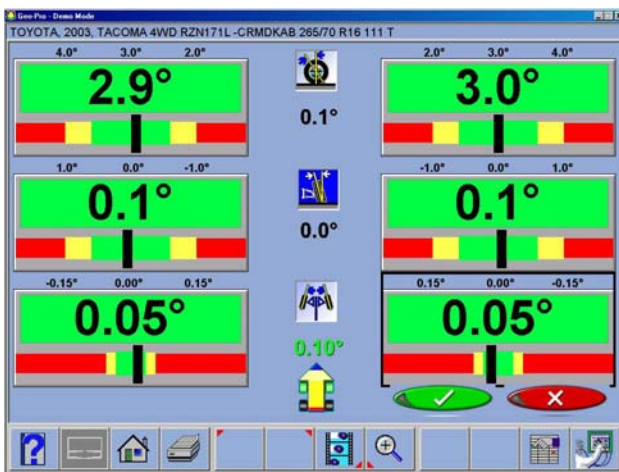




**Procedure: Adjust Caster, Camber Toe Elevated**

After selecting this icon, instructions appear in preparation for the adjustment.

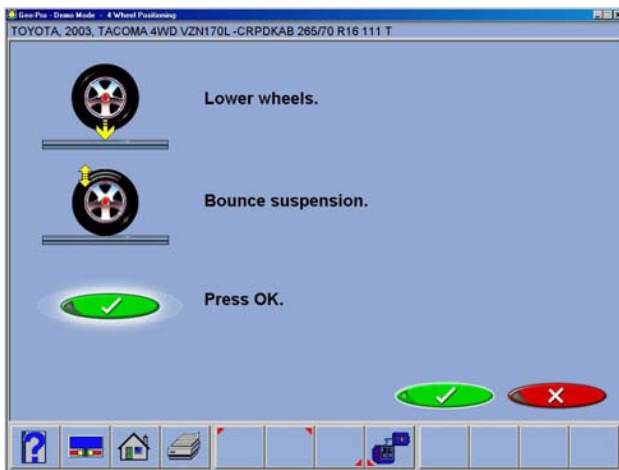
- Install brake pedal depressor (should already be locked from caster/SAI measurement)
- Remove pins from turntables
- Remove pins from rear slipplates
- Press OK
- Raise front wheels using rigid supports
- Press OK



**Adjust Rear Camber Elevated**

For either the front or rear wheels, this feature allows the wheels to be elevated while retaining the measured camber values. This gives the ability to make accurate correction of camber without vehicle weight inhibiting the adjustment process. This would be useful for tapping down a wedge on a strut vehicle.

The adjustment screen displays live caster/camber meters and numeric values for the left and right wheels along with live toe values. Make the desired adjustments while viewing the meters. When completed with the adjustment, press OK. Post-adjustment instructions are displayed.



- Lower wheels
- Bounce suspension
- Press OK

The software automatically returns to the readings screen where you started.



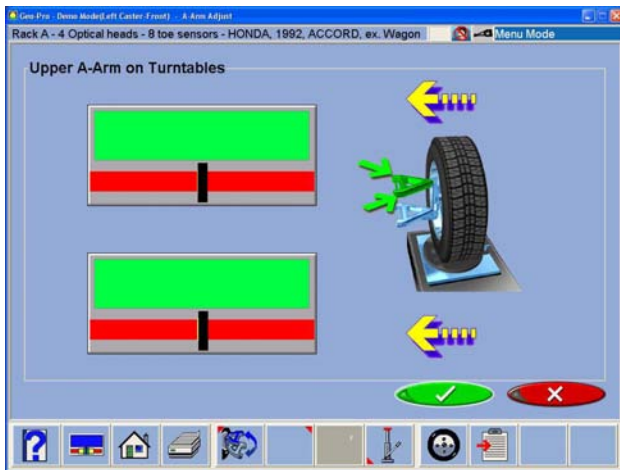
## Adjust A-Arms

Many vehicles have adjustment provisions for caster and camber located on the suspension A-Arm (control arm), either on the upper or lower arm. The adjustments may be made with shims, eccentric cams, or slots in the frame. Both angles are easily corrected to manufacturer's specification using the Adjust A-Arm icon.

First, a screen instructs the operator to apply the brake pedal depressor (important) and remove the lock pins from the turntables. Select **OK**.

The next screen, *A-Arm Adjust*, allows selection of the location of the adjustable A-Arm and whether the corrections will be made on the turntables or elevated. Examine the vehicle for the location of the adjusters. It does not matter whether the a-arms have shims, slots, or cams.

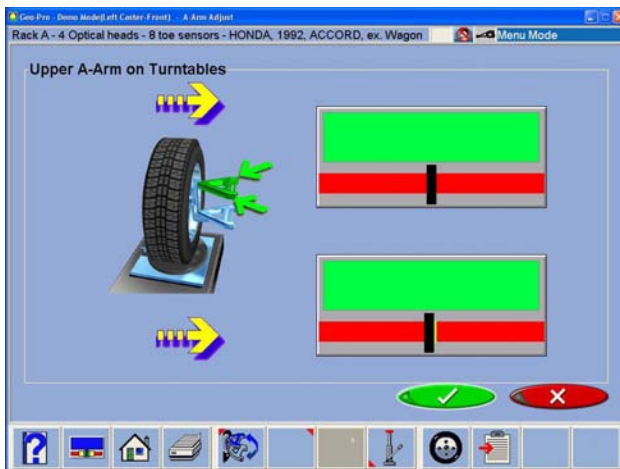
Select the proper icon on the Adjust A-Arm screen. The icons are :



*Adjustment on Upper or Lower Control arm.*



*Adjustment on Turntables or Elevated*



The adjustment screen contains a graphic of the right side a-arm along with two meters. These meters represent the movement of the front and rear of the a-arm, and their relationship to the desired readings. Move each side of the a-arm by adding/removing shims, loosening the bolts and sliding the arm, or turning the eccentric cams, until each meter indicator is centered in the meter – this is the desired value for both caster and camber. Press **OK** when this side is complete – a similar screen appears for the left side. When both sides are completed, press **OK** to return to the Readings Screen.



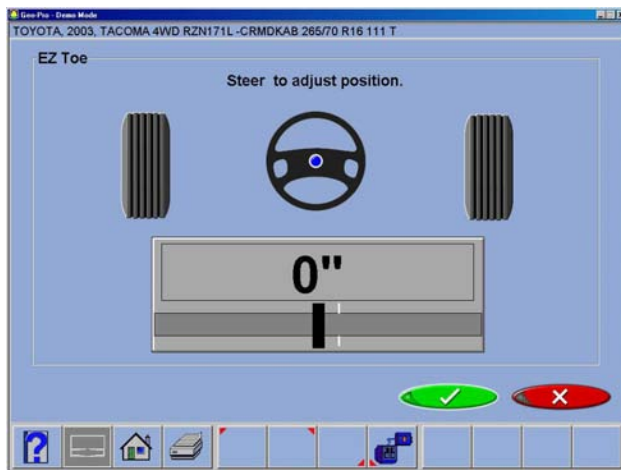
## EZ Toe

This software routine is an improved method of setting front toe, making it easier to obtain straight steering wheels. It also makes it possible to adjust toe with the wheels turned at any angle left or right, an aide when setting toe on cars with firewall-mounted rack and pinion units.

Use the following procedures:

1. Perform all alignment steps normally used to obtain alignment readings. Correct any misalignment in the rear as well as front caster and/or camber.
2. Select the EZ Toe icon from the Adjust screen.
3. Level the vehicle steering wheel, Select OK.
4. Steer the right wheel to the adjust position. Select OK.
5. The next screen shows a meter indicating the amount of toe change needed for the right wheel.
6. Adjust the right tie rod until the meter needle is in the green. Select OK after completion.
7. Follow the same procedures for the left wheel.
8. Select OK once the left toe adjustment is made.
9. Return to the Front Readings screen and recheck toe and steering wheel position.

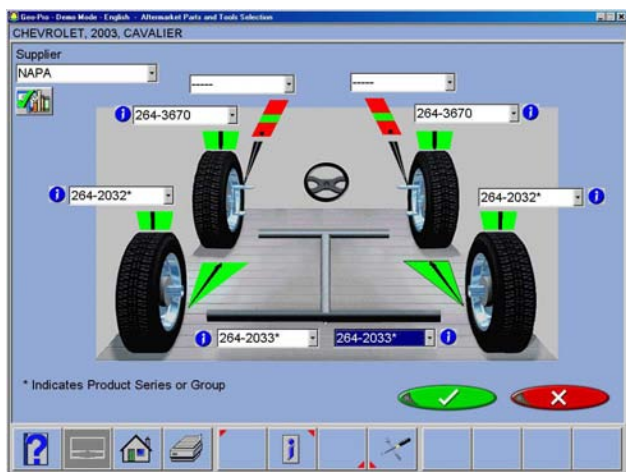
**NOTE: If using EZ Toe at a large turn angle, it will be necessary to use the Steering Wheel Clamp to hold the linkage steady at that position.  
"OK".**





## Shims and Kits

Many front wheel drive vehicles utilize aftermarket shims to correct front and rear camber and/or toe. This correction is achieved by placing the shim between the rear axle and the spindle.



When a vehicle that utilizes rear shims is accessed from the specification database, the technician can use the *aligner* to determine the proper shim to correct a misalignment. From the “Adjust” screen choose the Shims and Kits icon.

At this point the computer will examine the live camber and toe readings, compare them to preferred specification, and calculate the amount of change needed. It will then recommend the shim needed to make this correction. The screen to the left will be displayed.



## Default Part Vendor

Determine the desired part vendor to select as the default aftermarket supplier. This selection will vary location to location and upon the Technicians preferences.



## INFO

The correct part number is automatically selected and displayed dependant on the vehicle selected and the amount of correction required.

Highlight one of the part numbers displayed, then click on the “Info” ICON to invoke a screen describing the correct orientation of shims or other corrective aftermarket parts. The “Info” ICON can be selected from several places of the screen. If highlighted, information is available. See sample screen at left.



Installation video and detailed Instructions may also be available.

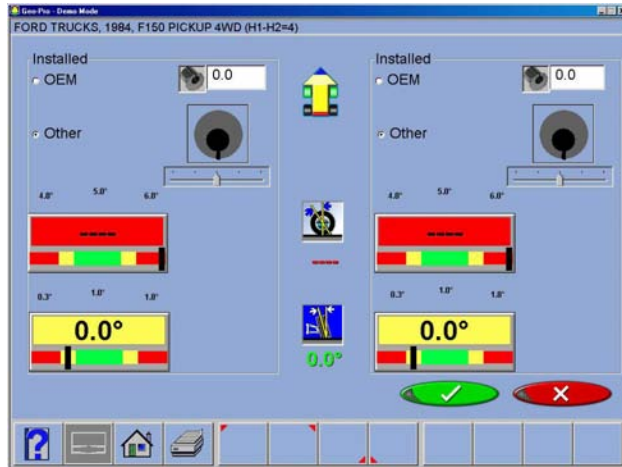
Click the “Aftermarket Tools Available” ICON to view tools required for the specific procedure if available.





## Offset Cams and Bushings

Many Ford 2-wheel drive trucks and many Ford/GM/Dodge 4-wheel drive trucks utilize offset sleeves and inserts around the upper or lower ball joints to adjust the caster and camber angles.



The program compares the current reading for caster and camber with the preferred specification, displaying the meters on-screen for reference. The required sleeve/insert to correct the angles is shown below the meters, along with the orientation of the slot. Proper orientation of the slot insures the correct amount of caster and camber is obtained from the sleeve/insert.

The calculations assume the current sleeve/insert is a ZERO (no offset). If it is not, examine the slot orientation to determine if the previous installation corrected camber or caster. Enter the value of the old sleeve/insert in the box below either caster or camber, whichever most accurately reflects the orientation of the slot.

**Note:** Whenever there is a sleeve/insert installed that is not zero, it is difficult to determine its affect on the calculation of the new required sleeve/insert. It is a good idea to have a few zero sleeves available to install in the truck and re-measure caster to get a true initial reading.

## Maintenance Maintenance Menu

This screen is the hub of all service and maintenance. Icon selections are:

**1. Calibration** – the software that enables the measuring Pods to be calibrated using the optional Customer Calibration Kit. An optional ISO calibration fixture is also available for certifying systems to ISO traceable standards.

**2. Diagnostics** – primarily for service personnel, this allows access to measuring Pod direct output.

**3. Demo Mode** - Used by a sales representative to demonstrate basic operation of the aligner. Not used for actual alignments.

**NOTE:** All screens will say “Demo Mode” when this feature is active.

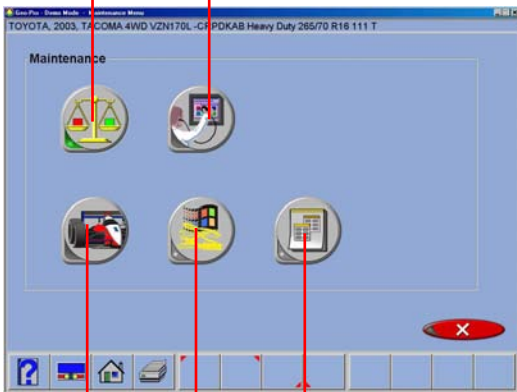
**4. Windows Utilities** – Allows access to the Windows Desktop and also allows the operator to perform routine installation of printers, software, etc.

**5. Database Utilities** – The feature is used for backing up and restoring alignment based data files, customer data, etc.



1

2



3

4

5

## Calibration

Before an alignment is performed the aligner must be calibrated to the rack that alignments are done on. Although the unit is shipped from the factory calibrated to zero we can not assume that all racks are exactly level in the field.



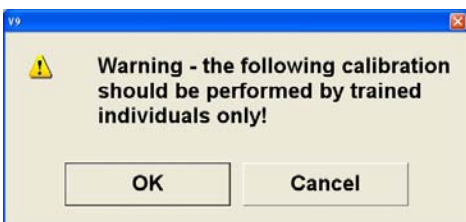
1. Raise the alignment rack to a comfortable working height.
2. From the Main Menu select the "Maintenance" Icon.
3. Select the Calibration button from the Maintenance menu.



4. Select the "Pod Calibration" button from the Calibration menu.

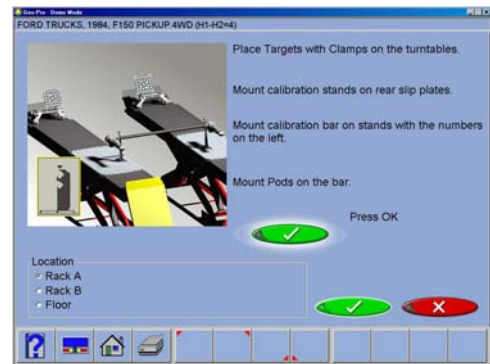
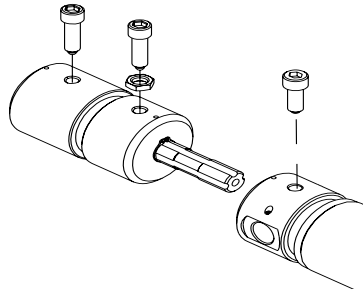


5. A "Warning" message appears instructing the user that the calibration process should be performed by trained individuals. Click on "OK" to continue.

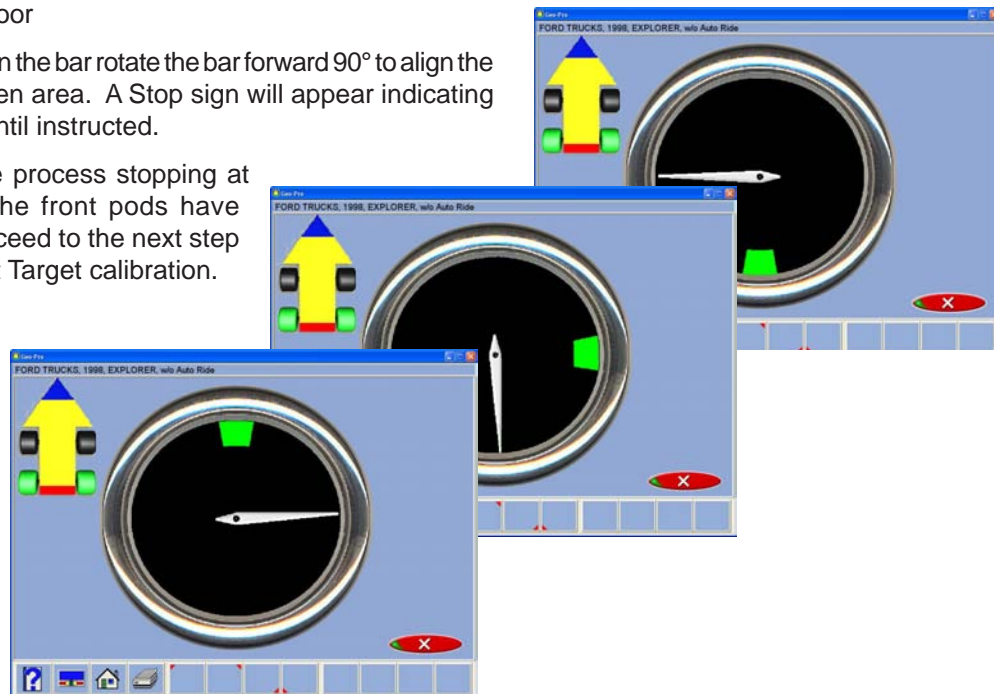
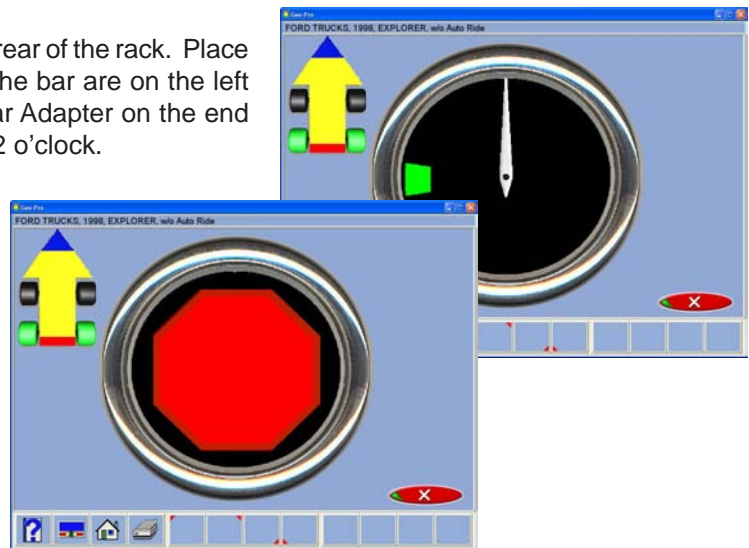


6. Place the calibration bar and stands, (calibration kit number EAK0222J02A) on the rear of the rack as shown in the figure.

**NOTE: IT WILL BE NECESSARY TO INSTALL THE CALIBRATION BAR ADAPTER (EAK0289J42A) ON THE END OF THE CALIBRATION BAR WITH THE FLAT SPOTS. THIS WILL ENSURE A SMOOTH ROTATION OF THE BAR DURING CALIBRATION**



7. Place the calibration bar and stands on the rear of the rack. Place the bar so that the numbers stamped on the bar are on the left side runway. Install the EAK0289J42A Bar Adapter on the end with the numbers with the set screws at 12 o'clock.
8. Place the left pod on the calibration bar so that the boom faces the rear of the rack.
9. Place the right pod on the calibration bar so that the boom faces the rear of the rack.
10. Place the targets on the front turn plates and orient them so that they are facing the pods. It will be necessary to leave the targets mounted to the wheel clamps.
11. Select the appropriate rack for calibration Rack A, Rack B or Floor
12. With the Pods locked on the bar rotate the bar forward 90° to align the needle within the green area. A Stop sign will appear indicating to hold the position until instructed.
13. Continue through the process stopping at each location until the front pods have been calibrated. Proceed to the next step to complete the Front Target calibration.

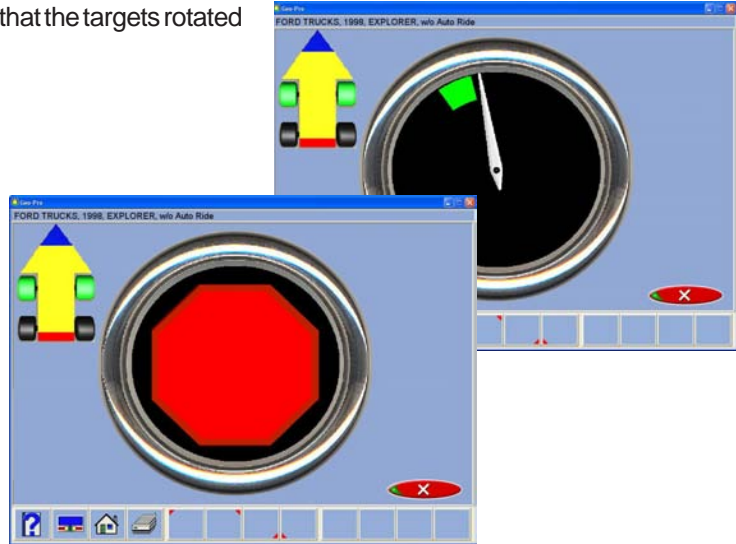


## FRONT CALIBRATION

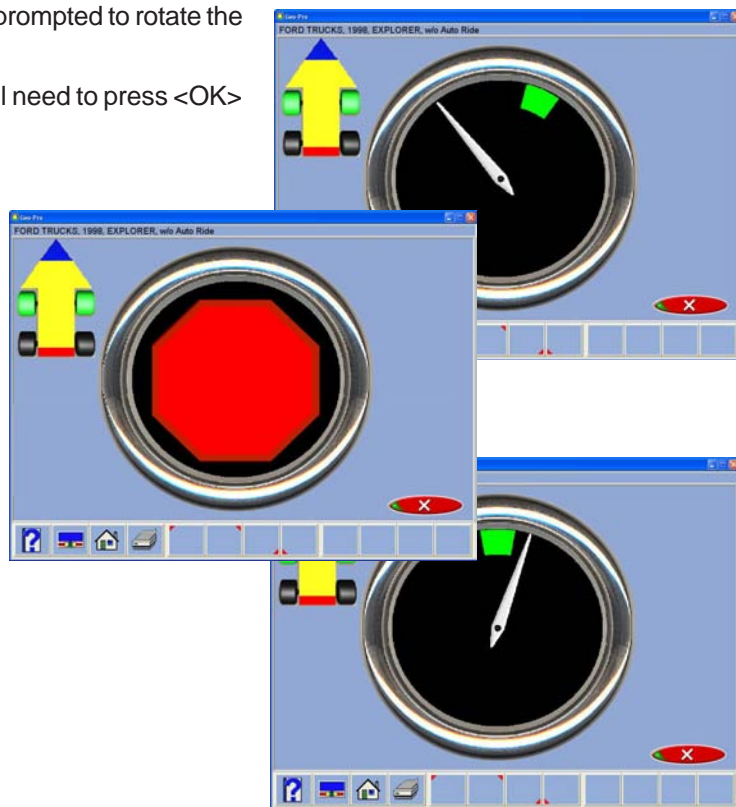
1. Place the targets in the bar so that the targets face the rear of the rack.
2. Place the Pods on the rear of the rack so that the boom of the pod points towards the rear of the rack.



3. The unit will prompt the user to rotate the bar so that the targets rotated forward 25°. A stop signal will appear.



4. After the information is taken the user will be prompted to rotate the targets 25° backwards from vertical.
5. When the calibration is complete the user will need to press <OK> button to store the calibration data.
6. CALIBRATION COMPLETE



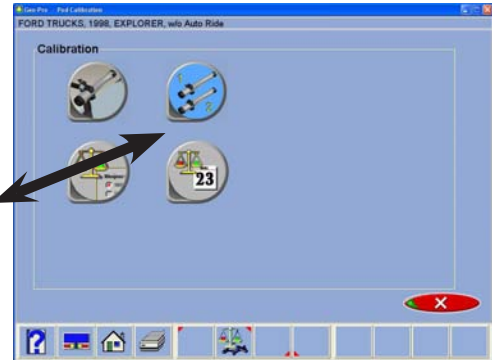
## CALIBRATION UTILITIES

The calibration menu incorporates other utilities to assist the operator. Below are a list of those utilities.

- Pod Identification
- Calibration Factors
- Calibration History

### Pod identification

Pods that are shipped with the aligner are matched to the aligner WAP and PC. In the event a new or replacement pod are received the alignment system uses “scan and find” process called “pod identification”. The Pod Identification is used to marry the pods with the alignment system. Follow the steps listed to marry a set of exchanged pods to an alignment system.



Select the Pod Identification button.

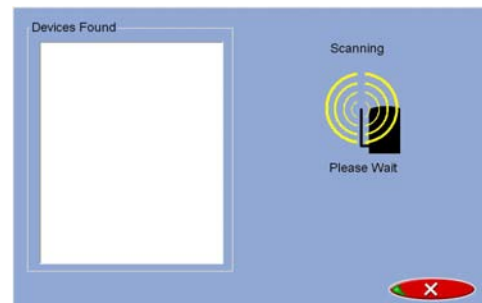
The user is instructed with a WARNING that this process should be performed by trained individuals. Click on the <OK> button to proceed.



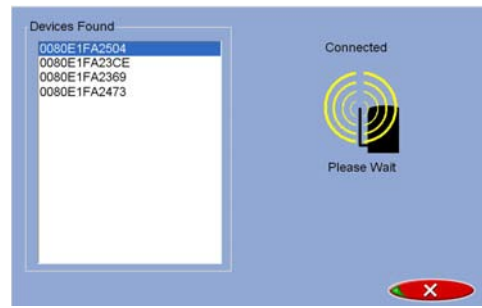
Make sure that the pods to be identified are powered up and ready to be located. If multiple aligners are used in the shop it is not necessary to power them down to complete this process. Click on the <OK> button to activate the scanning process.



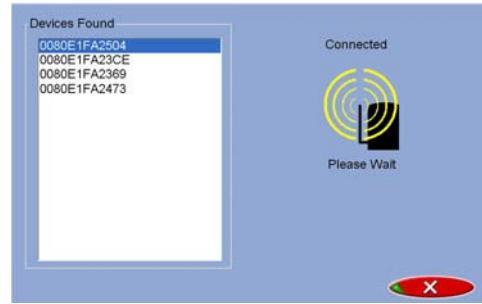
Using Bluetooth® technology the WAP searches for any aligner pod in the area. Please be aware that it's possible for the system to find a pod that may be located at the shop across the street. This will not interfere with the pod identification process.



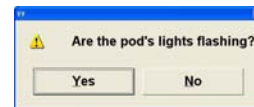
As the system acquires the different pods in the area it will start displaying the MAC numbers on the screen. For instructional purposes only the system has located 4 pods in the area, this could happen if there are two or more aligners in the area.



Once the system has finished finding all the pods the system will then begin the process of marrying the pods to the aligner. This process will start at the top of the list working it's way down. the system will highlight a pod number and ask the user if the LED's on any of the pods being married are flashing.



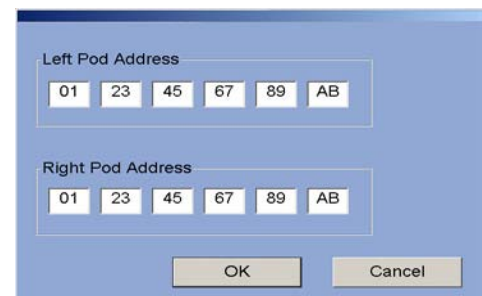
Look at both pods. If the LED's on any of the pods are flashing click on <OK>.



If the system does not locate 2 pods the user is instructed to power down both pods and press the scan button again.

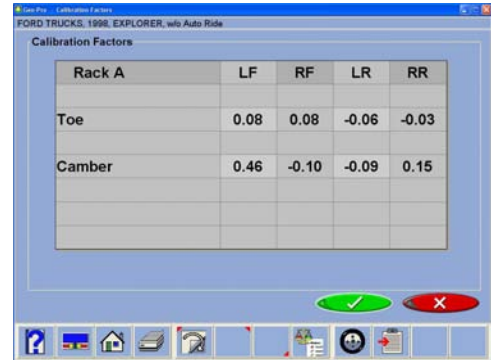
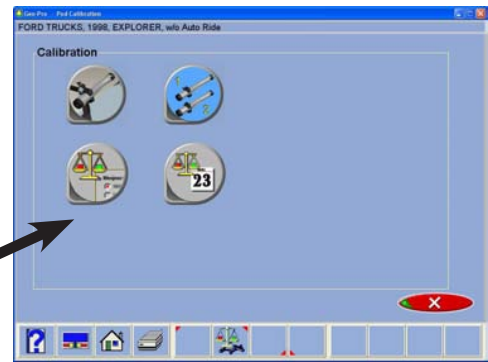


If after 3 attempts the system does not locate the pods it will be necessary to call technical support to generate the POD MAC numbers and enter them manually. This is done by clicking on the <CANCEL> button in step 4 and entering the Pod Identification for the respective Pods and pressing <OK>. (Before calling technical support locate the number of the radio pod by removing the rear bumper from each pod.)



## Calibration factors

1. Select the "Calibration Factors" button from the calibration menu.
2. Each line item represents the current calibration factor being used by the system during the alignment process. It is important to note the location of the calibration factors, the choices are Rack A, Rack B or the Floor.

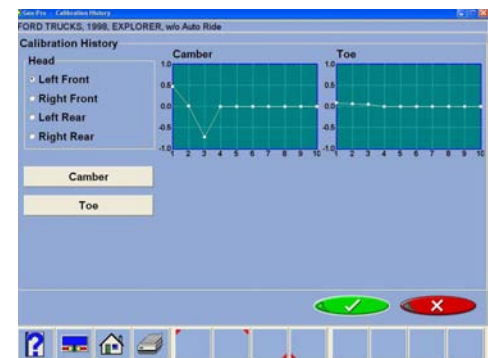


## Calibration history

This function is very useful to see how each Pod and Target has maintained consistency from 1 calibration to the next. If either a Pod or Target shows a significant jump or drop on the History line, it may indicate a catastrophic failure such as a drop to either a Pod or a Target or it may indicate that an incorrect calibration was done at that time.



1. Select the "Calibration History" button from the calibration menu.
2. Using the Radio buttons on the left side of the screen choose LF, RF, LR or RR. The graph will show the amount of change from one calibration to the next. The system will only report back one calibration per day. Click on the "Camber" or "Toe" button to see any special note that may have been entered during calibration.





Notes:

Operator's Manual  
Covers Hofmann Model EEWB717A and EEWA719A  
Software version 5.3.0

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