

Ultra Arago
Installation Instructions
Including “Short Bay” Systems

Form TEEWA550A0 rev C

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Arago 3™ Ultra

Installation Instructions

Form 5961

INTRODUCTION

An Arago 3™ Ultra aligner is installed much the same as conventional imaging machines, however there are unique considerations which must be addressed. Several supporting documents are referred to during this procedure, if unsure of document availability make arrangements prior to attempting the installation. Follow these instructions carefully for a successful installation.

An Arago 3™ Ultra system normally does not require RCP calibration at installation. The camera assemblies are factory calibrated and can be placed into service shortly after installation and setup. Camera assemblies do not have to be replaced as a pair, however if ISO traceable factory calibration is to be maintained, they must be replaced as a pair. No field calibration is required in this case. It is also possible to replace the camera assemblies singly, but a field RCP procedure must be performed

These instructions cover the main aspects of Arago 3™ Ultra installation:

- ⇒ Preparing for installation
- ⇒ Qualifying the site for installation
- ⇒ Console assembly and setup
- ⇒ Placement/assembly base and support columns
- ⇒ Calibration of the Pod Motors
- ⇒ Camera aiming procedures
- ⇒ Initial operation of Arago 3™ Ultra software

Before attempting installation, read these instructions thoroughly and understand the tasks involved. Review all requirements of installation to avoid oversights resulting in lost revenue, and lost customer confidence. Be aware of the environment conducive to the optimum performance of imaging alignment. Procure the necessary tools to do a quality job and last most important, perform the installation safely by observing all precautions associated with the task at hand.

INSTALLATION PROCEDURES

1. Qualify the site for installation

Verify site requirements as discussed below. The Pre-Installation checklist was created primarily with sales personnel in mind, however it can be used as tool to verify bay conformance to requirements. Below are some key issues to consider for a successful installation. See Figure 5 on page 11 for a typical bay layout.

Power Source

115 volts AC, 15 amp noise free dedicated service, assure a good ground

Rack integrity:

Is the rack/lift safe, are the lock mechanisms secure

Check for runway coplanar at all heights

Is rack relatively level - for ease of rollback

Turntable condition - free from binding, do they exhibit good rotational stability

Rollback requirements - is a kit required - acquire if necessary

Is the field of view conducive with imaging alignment (no obstructions)

Floor integrity:

Will the floor adequately support the rack, has a core test been performed?

Is the concrete properly cured, new flooring should be cured at least 28 days.

Are there any pipes, or wiring under the floor that could be drilled into?

Will the floor flex, crumble, are there expansion joints?

Environmental concerns

Inspect the area for heaters, reflections, adjacent machinery, fans, RFI etc.

Space requirements or system footprint

Is there a space of 85" to 113" in front of the lift for normal installations, or 68.5 to 85.5 inches for a "Short Bay" installation, when measured from the Turn Table center to the rear of the support columns.

The distance between the support shields at 81" to 93" (87" recommended) This value is not to be confused with the installation baselines to be determined later.

Take into consideration the size of the rack and the space required of the Arago.

Adjacent Power Noise

Look for motor noise, processors on same power service, RFI

Ergonomics

Can the operator move about freely to work safely and view the display?

Will the movable camera feature be utilized in the installation?

NOTE: *This equipment is intended for indoor use only. Do not expose to rain, direct sunlight or excessive temperatures.*

Typical Arago 3™ Ultra Installation

2. Tools and equipment required for installation

Study the list below and make procurement arrangements prior to installation. Time is poorly spent searching for proper tools once the project has begun. The check list below is comprehensive and based on actual installations in a variety of locations.

- T-handle Ball-end Hex Wrenches
- #1 Phillips Screwdriver - Pod Covers
- #2 Phillips Screwdriver - Pulley Assemblies and Covers
- Box End or Combination Wrenches: 3/4 - 7/8; 9/16 - 1/2; 7/16 - 3/8
- Tape Measure - Used To Square The Optics With The Lift Center Line, And For Camera offset
- Chalk Line - Used For Lift Center Line
- 2 Or 4 Foot Level - Leveling Support Columns
- Tin Snips - Used To Open Carton Banding
- Box Cutters - Opening Cartons
- VOM - Verifying Supply Voltage
- 16 Oz. Hammer - Set Anchor Bolts
- Hammer Drill And 1/2" Bit
- Carpenters Pencil - Mark Support Location On Floor
- Glass Cleaner And Rags - Cleaning Of Targets After Install if Necessary
- Instructions

3. Assembly and setup of the console

Consoles are shipped mostly complete, however some minor assembly is required upon installation. Refer to the illustration below for a completed console. The installation personnel will be required to assemble the clamp hanger brackets to the cabinet, In addition, the computer and its peripherals must be placed into the console and wired together.

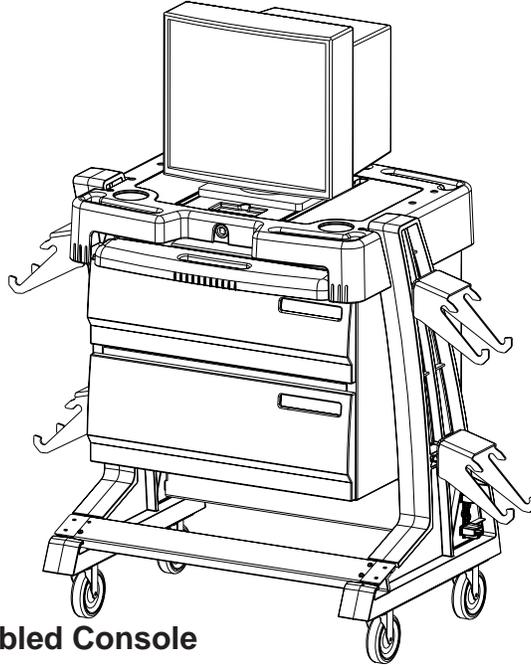


Figure 1 - Fully Assembled Console

1. Remove the console from the skid.
2. Install the wheel clamp hanger brackets onto the side of the console.
3. Locate all cartons associated with the console and computer assembly.
4. Inspect each component for damage, notify shipping company immediately if damaged, report any shortages to customer service.
5. Place the Monitor on the console top, secure with the sliding fasteners.
6. Remove the back panel from the rear of the console as shown in Figure 2.
7. Place the desktop PC into the top console shelf from the front.
8. Place the keyboard and the mouse on the sliding drawer. Feed the cables through the hole in the middle of the drawer. Secure cables to underside of drawer with plastic cable ties.
9. Place the printer in the bottom console drawer. Install toner cartridges and paper.
10. Route cables from each of the above peripherals to the PC. Refer to the drawing detail in Figures 2 and 3 for proper cable connections.

IMPORTANT - Connect the Mouse to the front USB port.

NOTE: Check interconnect harnesses and cables before applying powering to PC.

Once the Console is assembled, the PC can be booted and software configuration finalized. Verify proper PC operation before reattaching rear panel.

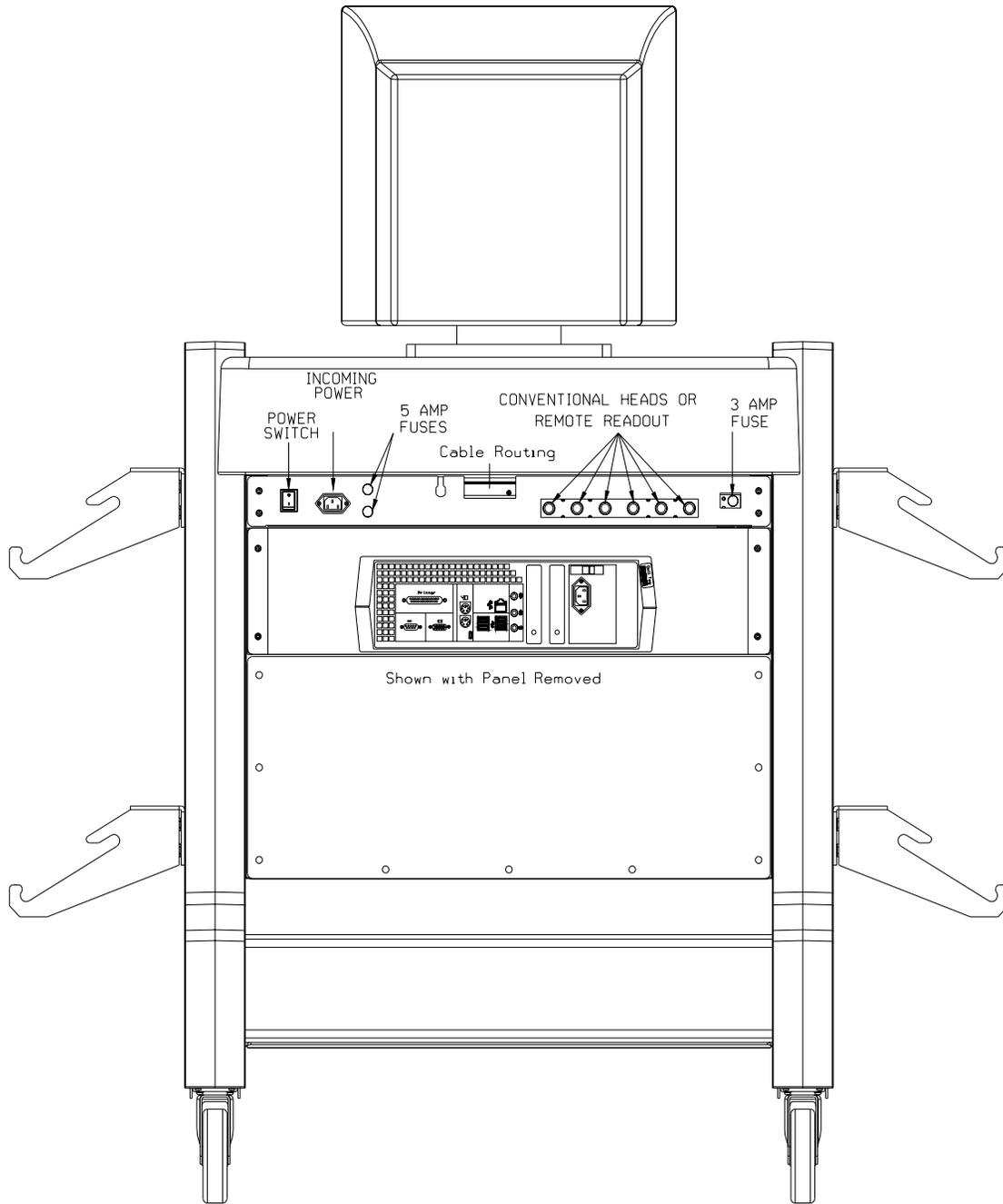


Figure 2 - Console rear view with PC access panel removed

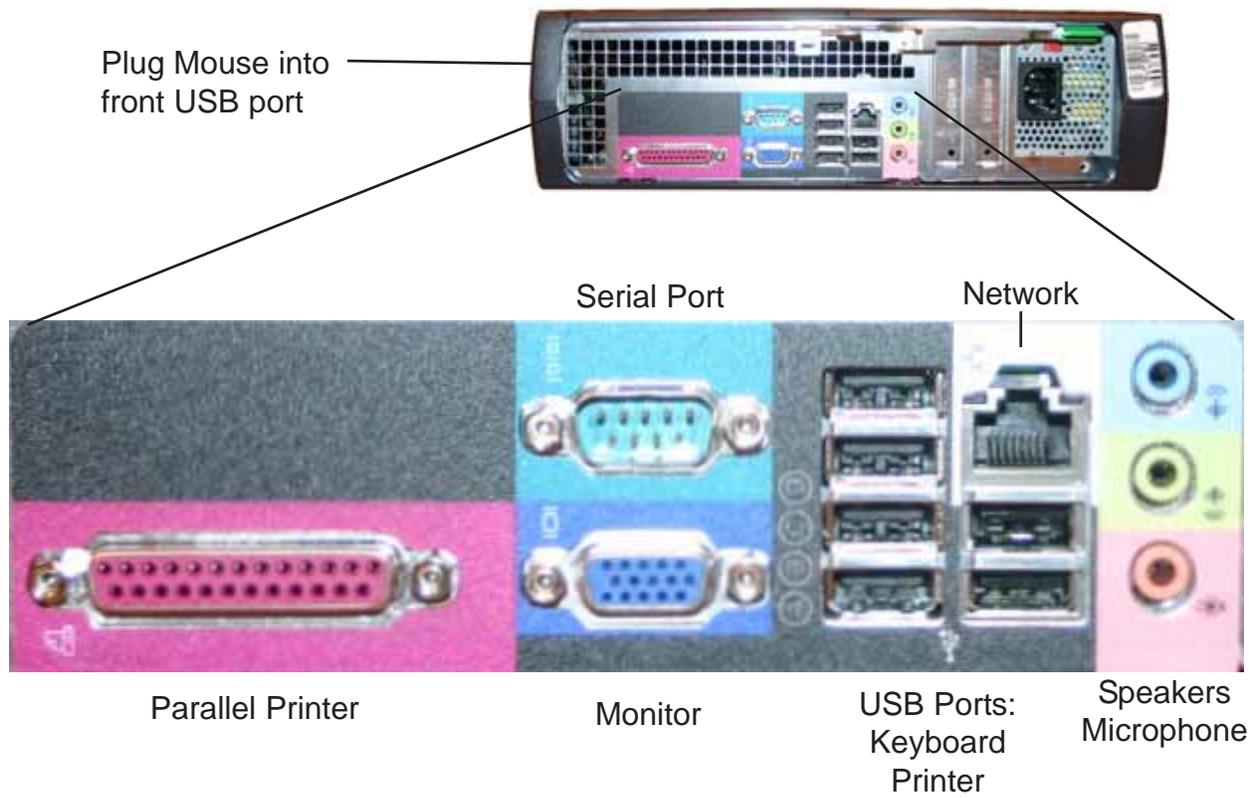


Figure 3 - Rear view of PC

4. Installation Baseline layout

These instructions assume a lift or rack is being used as the alignment surface. If the floor is to be used, identify the spot where the turntables will rest, and base measurements from that spot.

1. Determine the Lift Centerline. Measure between runways front and rear and mark midpoints on both. A mark can be made forward of the lift by placing one end of a string at a spot on one side of the lift, placing a marker on the other end of a string, and scribing an arc forward of the lift across the centerline. Repeat scribing an arc from the same spot on the other side of the lift. The intersection of the two arcs is the lift centerline. Use a chalk line to snap a centerline between the marks, and project out past the anticipated camera baseline in front of the rack, or to the shop wall if closer. See Figure 5.
2. Determine the Turntable Centerline by raising the lift to the predetermined alignment height. Use a plumb-bob from the center of the turntable and mark a spot on the floor next to each turntable. Snap a chalk line through the marks to establish the centerline. Use the plumb bob on the outside of the turntables to mark a center spot on the floor on the outside of each runway (See Figure 5).
3. Determine the Turntable Height (the normal operating height of the rack). On a multi-level lift (i.e. parallelogram) put an average size car on the lift and raise it until the alignment technician feels comfortable performing wheel turns, rolling the vehicle back and forth, and making toe/camber adjustments from underneath. On other lifts/racks (such as a hoist rack) it is necessary to use the leveling leg height. Typical turntable height is from 30" to 36".

If the user will be operating the Arago 3™ Ultra without the moveable feature you may want to mark this height position so it is easy to raise the lift to this chosen height later – this is the height the operator must use when performing alignments.

4. Determine the Support Baseline. The Arago 3™ Ultra camera supports must be installed a minimum of 85 inches (2159 mm), and no greater than 113 inches (2870 mm) from the center of the turntables to the *BACK* of the base assembly. Measure 85" – 113" (or whatever the space will allow within the above parameters) from the turntable centerline forward at two locations and mark these points.

Alternate measure point - the front anchor mount hole in the base can be used as a baseline reference point as well if desired. Subtract 13 inches for this value, 72" to 100" inches when measuring from center of turnplates to from base anchor hole.

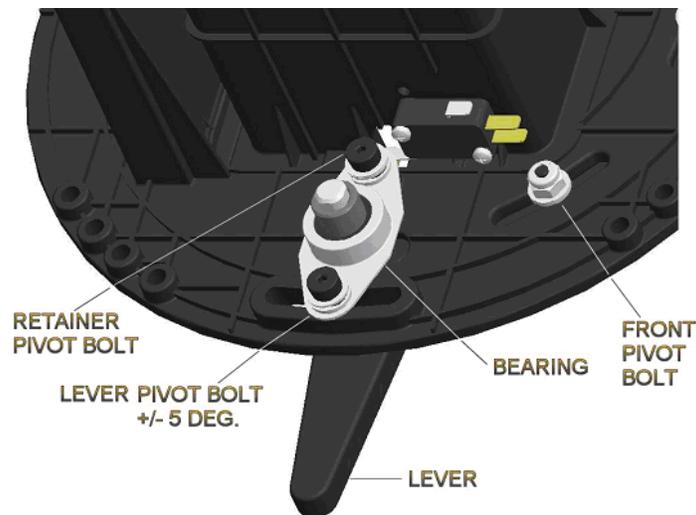
5. The Arago 3 can be installed at "Short Bay" distances between 68.5" and 85". Special installation instructions must be followed see section 4.1 Short Bay Installation Instructions, and SW version 4.3 or later, or the SW contained in the Short Bay Kit.

4.1 UA3 Short Bay Installation Instructions

The Ultra Arago can be moved closer to the front wheels down to a minimum distance of 68.5" [1740mm]

NOTE: Setup of the camera pods adjustment lever is slightly different from the standard setup done at the factory. The factory setting is to have the lever set at the mid-point (zero degree mark) for +/- 5 degrees of movement of the camera pods either to the left or right as needed (see picture below). For a short bay setup, the lever will need to be adjusted most of the way to the **outward** position of either camera pod to allow for greater movement inwards of the lever for the narrow/shorter vehicle.

Procedure: Remove the cover that covers the pivot lever (see picture below). Note the location of the "front pivot bolt" – it should be in the approximate middle of the pivot slot of the camera mount – this is normal for the straight ahead (+/- 5 degrees) position of the lever. Loosen the "retainer pivot bolt" – just enough to allow for rotation of the "bearing". Now loosen the "lever pivot bolt" – just enough to allow for rotation of the "bearing". Rotate this "bearing"/"lever" all the way to the outside direction of the camera pod – the "lever pivot bolt"/"bearing" should be close to the end of the lever's pivot slot in the camera mount – **NOTE:** the direction will be different for each camera pod. The "lever" should make contact with the rib underneath the slide car plastic housing that restricts the lever's angular movement. You should notice that the "front pivot bolt" has now moved closer to the end of the pivot slot in the camera mount. Retighten the prior mentioned bolts – not to tight to cause the plastic to break. Now turn the lever inwards until it maxis out at the 10 degrees inwards viewing angle. Replace the cover. Repeat for the other side camera pod.



NOTE: Center placement of vehicles at the extreme range (80" [2032mm] to 68.5" [1740mm]) will be critical to ensure that all 4 targets are in view of the camera during the entire alignment process.

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IMPORTANT: The vertical height of the camera pods is also more critical when the distance is decreased from the optimum setup (distance from the center of the towers to the center of the

front wheel stop, etc.). From 110" [2794mm] down to 90" [2286mm] the normal factory setup is sufficient (lower limit stop is set at 32" [813mm] – this is measured from the top surface of the lower limit stop to the floor or 8.75" [222mm] to the base cover plate).

For the distance of 80" [2032mm] the lower limit stop will need to move downward to a distance of 4" [102mm] from the factory setup.

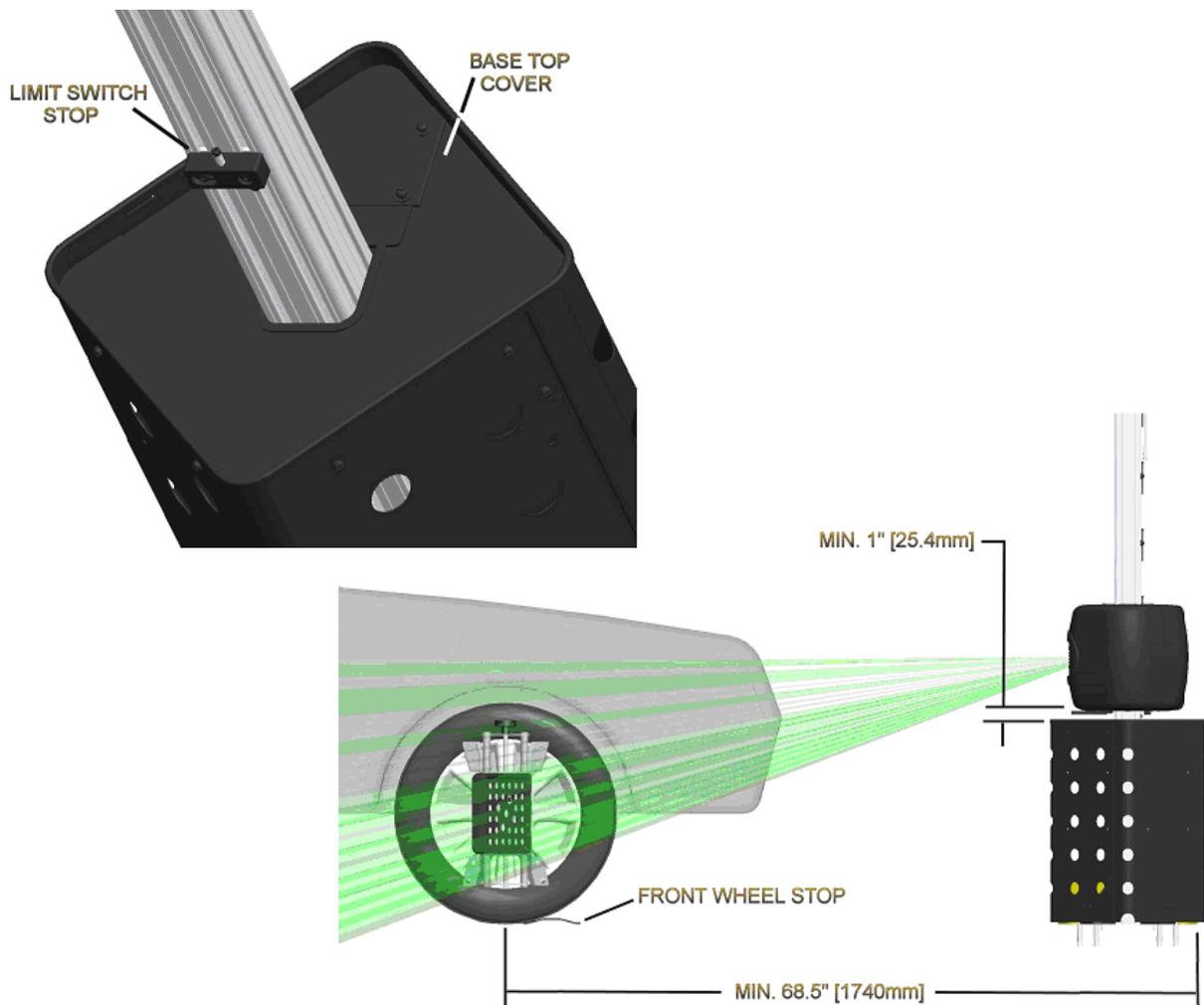
NOTE: The base top cover plate will have to be removed to keep the power cord that is attached to the tower from binding up. You will not need to adjust the gear rack – there is sufficient range built into the UA3 for this lower camera pod height.

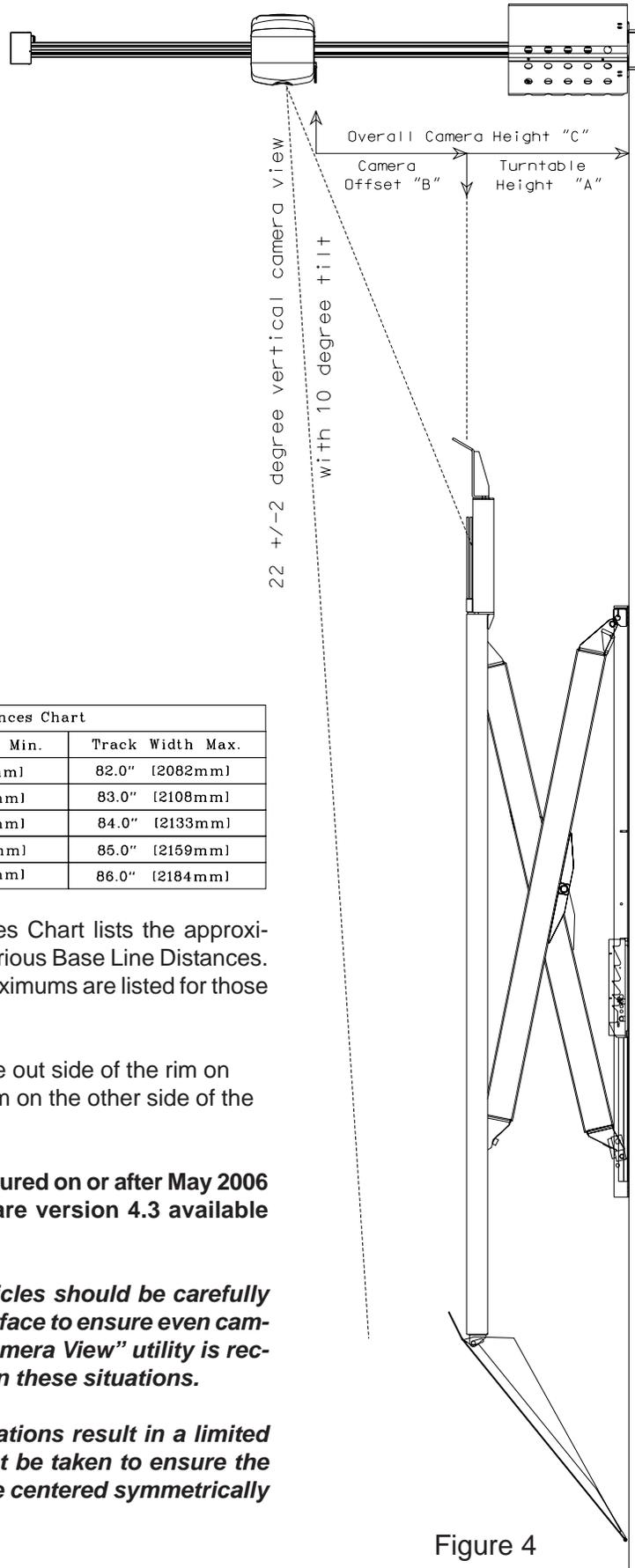
For the distance of 68.5" [1740mm] the lower limit stop will need to move downward to a distance of 7.5" [191mm] from the factory setup.

NOTE: The base top cover plate will have to be removed to keep the power cord that is attached to the tower from binding up. You will not need to adjust the gear rack – there is sufficient range built into the UA3 for this lower camera pod height.

NOTE: Optimum setup or adjustments made as described above will be sufficient for tire/wheel diameter ranging from 15 [381mm] to 34 [864mm] diameters.

See illustrations below.





Short Bay Installations

Installation Distances Chart		
Install Distance	Vehicle Width Min.	Track Width Max.
68.5" [1740mm] *	48.0" [1219mm]	82.0" [2082mm]
80.0" [2032mm]	48.0" [1219mm]	83.0" [2108mm]
90.0" [2286mm]	48.0" [1219mm]	84.0" [2133mm]
100.0" [2540mm]	48.0" [1219mm]	85.0" [2159mm]
110.0" [2794mm]	48.0" [1219mm]	86.0" [2184mm]

The above Installation Distances Chart lists the approximate camera beam offset for various Base Line Distances. Vehicle width minimums and maximums are listed for those distances for reference.

“Vehicle Width” is defined as the out side of the rim on one side to the outside of the rim on the other side of the front wheels.

*** Requires products manufactured on or after May 2006 AND a Software kit or Software version 4.3 available August 2006.**

NOTE: Narrow and wide vehicles should be carefully centered on the alignment surface to ensure even camera view. Use of the “Live Camera View” utility is recommended when setting up in these situations.

NOTE: Shortened bay installations result in a limited camera view. Extra care must be taken to ensure the support and camera beam are centered symmetrically to the alignment surface.

Figure 4

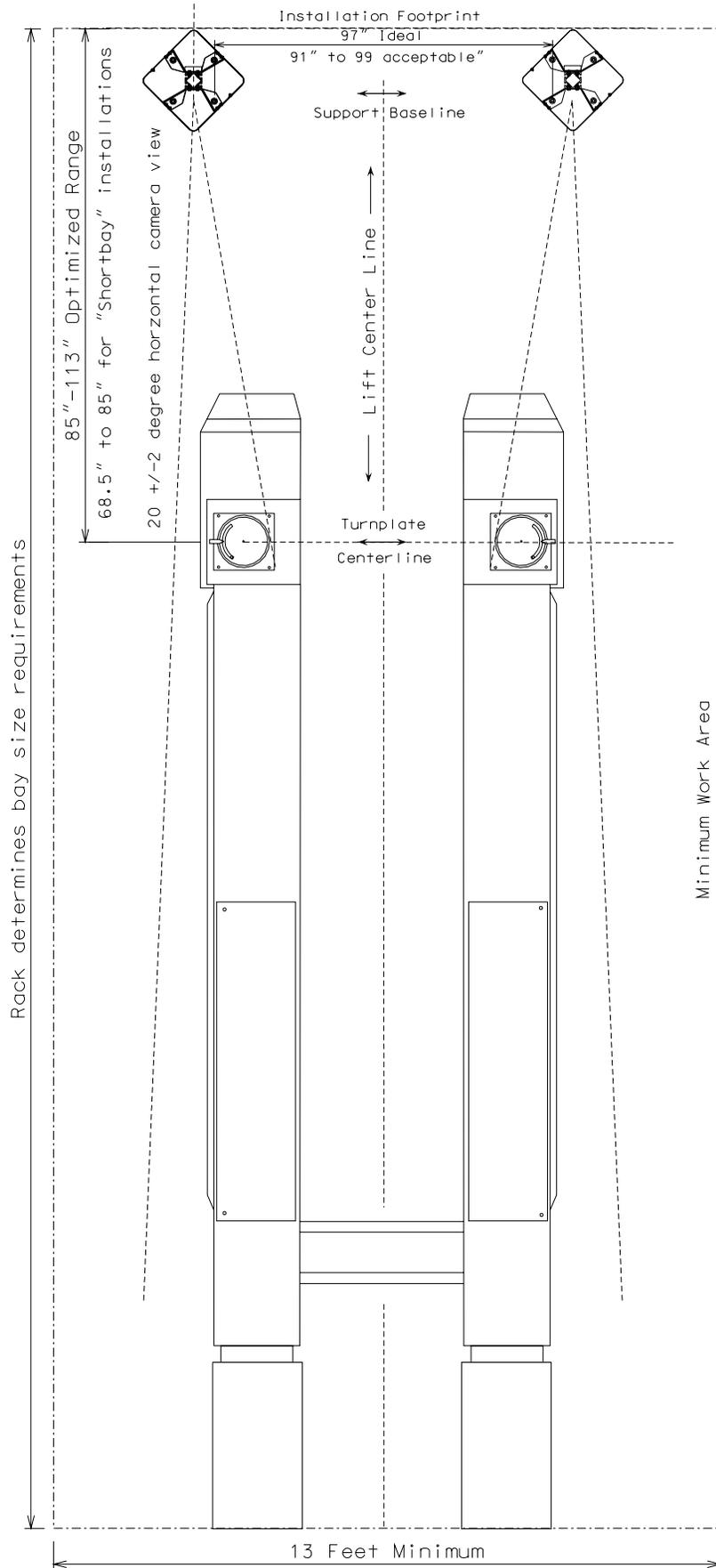


Figure 5

5 - Support Assembly

1. Remove both camera column assemblies from the shipping container.
2. Locate the base end of each column. Using a sharp knife or cutters, cut the “Bungy” cord used to secure the counter-weight for shipping.
3. Position column assemblies onto the floor centered on the baseline measurements made earlier. See Figure 6. Base Plates will generally be 97 inches apart as measured between the inner holes. Refer to Figure 5 on page 11 for layout detail. Using a marker, mark the hole locations for the 4 mounting bolts with each column.

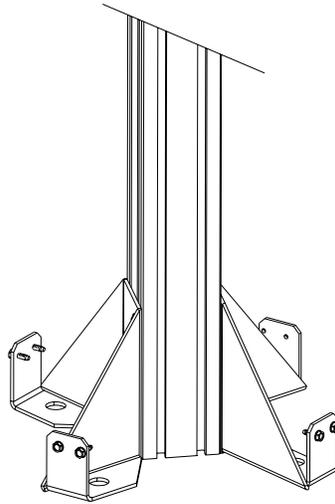


Figure 6

4. Using a rotary hammer drill equipped with a 1/2 x 12 inch bit, bore each hole carefully. It is generally a good idea to drill all the way through the slab so that if the anchor must be removed later, it can be driven through the concrete and into the ground below. Clear debris before proceeding.

HINT: Bore one hole, tap in an anchor bolt and lightly secure the base with this one bolt. Proceed boring another hole using the hole in the base as a guide. Continue one hole at a time until all four are inserted.

HINT: Pour a small amount of water into the hole as it is being bored to significantly reduce concrete dust. Use a shop vacuum to clean area before proceeding.

5. Using a 2 or 4 foot Level, shim or adjust the column base-bracket assembly until column is level. Tighten anchors to 50 ft lbs torque.
6. Lower limit stops should be factory preset to the height of 33 inches for above ground lift installations. Move the limit stop to 24 inches for installations using an in-ground lift. Stops on both columns must be set at the same height. Measure with a tape measure for use later. The distance measured is: _____ inches.

6 - Electrical Assembly - Cable Connection

Both camera column assemblies are shipped pre-wired. However interconnection between the cameras and the console are required on installation.

1. Locate the two separate control cables. Shipped separately
2. Connect one cable end to the bottom connector pair on the Interface box on the right column. Connect the other end of this cable to side connector pair of the interface interface box on the left column. Secure each cable with a strain relief.
3. Locate the remaining control cable. Connect one end to the connectors at the rear of the console. Secure with the strain relief at console rear.
4. Connect the other end to the side connector pair of the interface box on the left column.

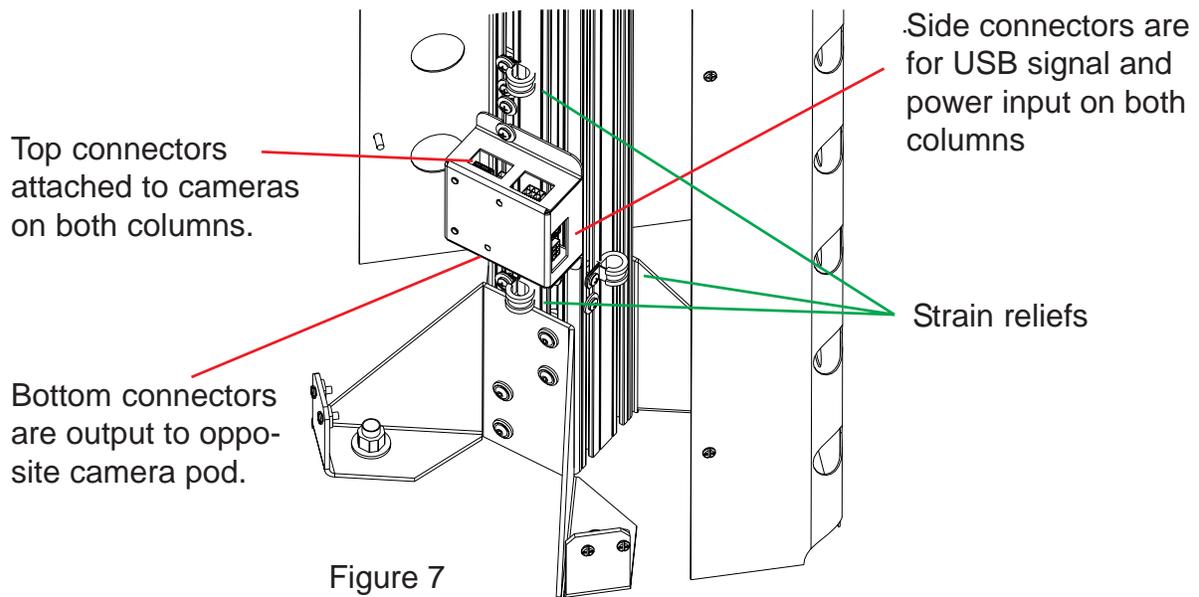
NOTE: The console control cable can be attached to the right column if so desired, however signal in always goes into the mini-hub identified by the USB "B" connector. The output to the mating camera pod always exits via the USB "A" type connector pair.

6. Secure the cables with the strain reliefs on each column.
5. Place the cable guards over the cables between the columns and anchor in place.

NOTE: Recheck all connections for mechanical and electrical integrity

7 - Attach Base Shields

1. Attach column base shields using four 10-32 x 3/8 phillips head screws each. Attach



the shield to the “ears” of the base brackets by sliding the screws into the keyholes on the lower edge of each shield. Do not tighten until all screws are started.

2. Connect front and rear shields to each other with two 10-32x3/8 phillips head screws on each edge. Tighten all shield screws. Refer to Figure 7 for detail.
3. Attach the press-on molding around the top of both column sheilds.

8 - Calibrate Pod Motors

The software needs to know distance traveled each time it searches for the targets. The computer calculates speed by knowing the distance times the length of time while moving. Calibration determines this speed, usually a few inches a second. An accurate distance is required to get an accurate speed. The result of an inaccurate motor calibration may be jerky target search where the motor moves too far each search increment or too little.

Before beginning the calibration process the camera pods must be adjusted to the very bottom or the very top of their travel.

1. From the Main Menu, select the Maintenance tab.
2. From the Maintenance tab, select Aligner Diagnostics.
3. From the Aligner Diagnostic, select Camera View.

NOTE: IT IS NOT NECESSARY THAT THE CAMERAS SEE TARGETS AT THIS TIME.

4. Using the mouse, select Manual Mode, then “Go to the bottom” (Figure 8). The motor should power up and move both cameras to the bottom of their travel (bottom shut-off switch).
5. Exit by clicking on the “Home” key in the toolbar.
6. From the Main Menu, select the Preference tab.
7. From the Preference tab, select the System Configuration Icon.
8. Make sure that the Imaging System Type is set to Three Cameras. (Figure 8)
9. Check both the “Pod Motors Available” and “Enable Motor Target Search” boxes”.

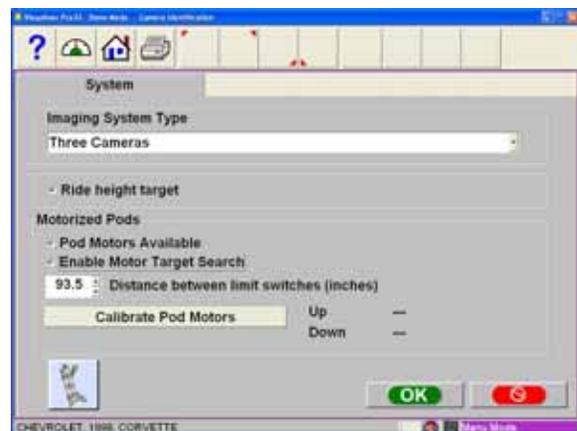


Figure 8

-
10. Measure the distance between the two limit switches. Input this value into the distance section. See Step 6 page 12 for this recorded value.
 11. Using the mouse pointer click on “Calibrate Pod Motors”.
 12. The pod motor should travel to the upper limit stop and then travel to the lower stop. After the cameras travel the distance the unit should automatically enter both the “Up” and “Down” distance, usually the distance would be a couple of inches a second.
 13. If the Up or Down speed is greater than 3.0 in/sec the speed is not calibrated correctly. Go back to Step 4 and repeat the pod motor calibration.

9 - Camera View

1. From the Main Menu, select the “Maintenance” tab.
2. From the Maintenance tab, select Aligner Diagnostics. Select “Camera View”.
3. Clamp the front targets to the turntables making sure they are centered on the turntable. Move the left turntable-target assembly out until a portion of the front target can be seen in the left camera view screen (Figure 8). Levers are still all the way out. Mount the right front target on the turntable and move the assembly out to the same distance from the rack centerline as the left turntable-target assembly.

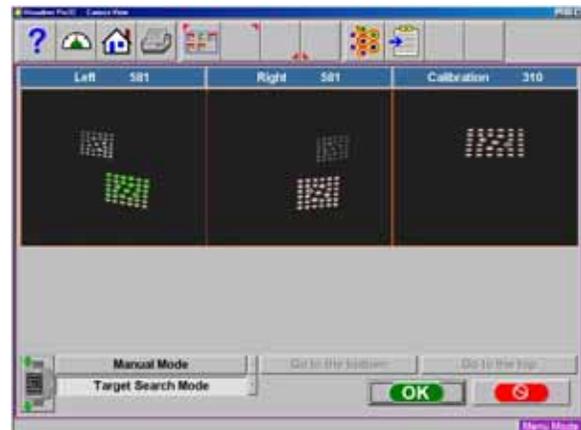


Figure 9

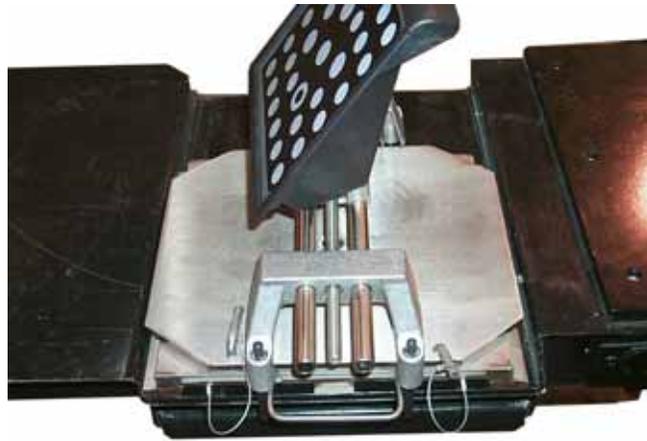


Figure 10a

4. Set the rear targets as far back on the lift as is reasonable (Figures 10a and 10b). Make sure they are equal distance from the lift centerline and the target clamps are square to the lift. The clamps should be spread equal distances and the rear targets should be equal distances from the front targets.



Figure 10b

5. With the cameras aligned and the rear targets set as described in step 4, the rear targets in the camera view should be aligned and should be equal distances from the centerline of the camera views. If the two views are more than 1 fid out of alignment, the alignment and position of the columns need to be checked.

10 - Camera Pod Rotation

In order to optimize the Arago Ultra 3 alignment system, the cameras have been mounted on a swivel pod assembly. This swivel pod allows the right and left cameras to rotate horizontally to see the targets in all fields of views (Narrow, Normal and Wide). The Arago Ultra 3 does not require initial RCP because the third camera maintains constant calibration.

The System does however need to know what is narrow, normal and wide. The following steps should be followed to complete system setup in preparation for use. In this step the system is looking at the calibration target only.

1. From the calibration icon single click on the “Camera Pod Rotation” icon. (Figure 11)
2. Adjust the camera levers to the illustrated position shown on the screen and click on **<OK>**. (Figure 12)
3. After clicking on “OK” as indicated in step 2, the camera rotation levers change positions. Move the camera levers to the position shown and click on **<OK>**. (Figure 13)
4. Continue the process until all camera positions have been checked. After the final rotation lever has been checked click on the **<Cancel>** button to exit. See Figure 14.

NOTE: IF A MISTAKE IS MADE DURING THE TEACHING PROCESS, THE OPERATOR CAN SIMPLY CLICK ON THE RESET BUTTON TO CLEAR THE LEARNING PROCESS AND START AT THE BEGINNING.

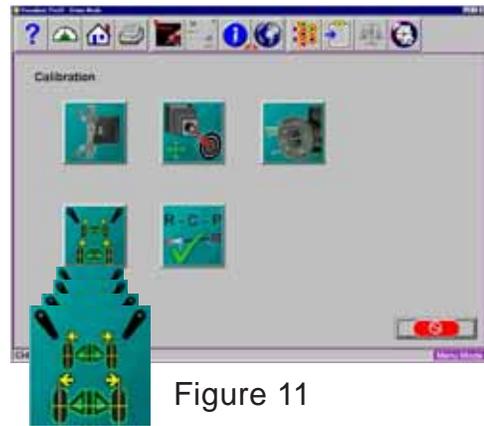


Figure 11



Figure 12



Figure 13



Figure 14

11 - Target ID

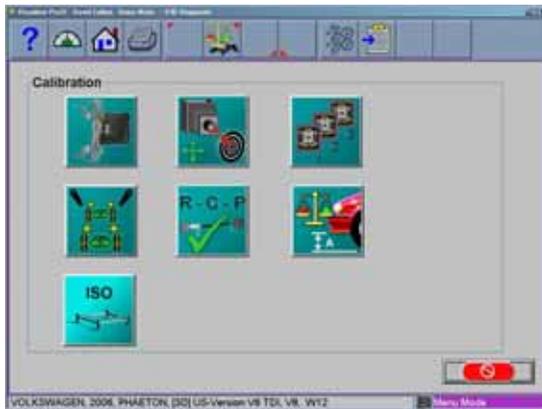
The purpose of the Target Identification procedure is for the software to model the dimensional characteristics of each target/clamp assembly. This allows the aligner to later accurately compute the position of the wheel when the rim clamp is attached.

The Target ID procedure is normally done only once at installation time. If a target or rim clamp is ever replaced for any reason, the new target should be identified using this procedure after it is installed. This process requires that a short wheel base passenger vehicle be used. Target ID is performed one at a time by placing each target and clamp assembly on its corresponding wheel and rotating the wheel forwards and backwards, following the on-screen arrows and stop signs. Each Target ID should take a few minutes to complete.

From the “Home” Screen select the “Maintenance” Tab.



From Maintenance select the “Calibration” icon.

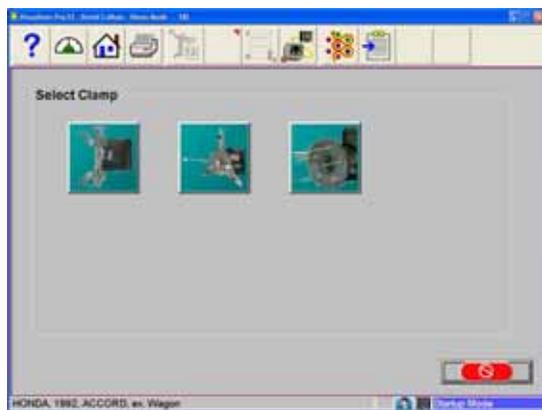


Step 1. Click On the Target ID Icon



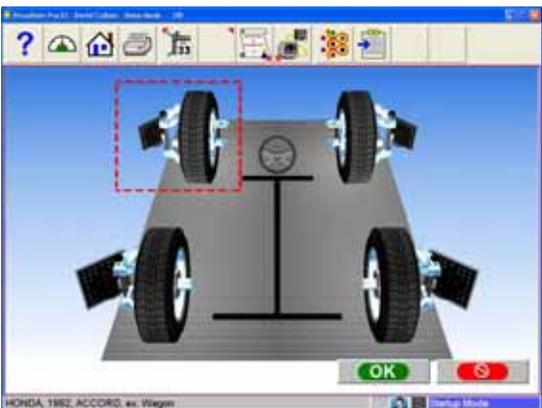
Step 2. Select desired clamp

Three types of wheel clamps are available for use with this aligner, the standard wheel clamp, a universal hub clamp and a “Pin Type” clamp. Pin clamps are used on several OEM wheels when No Runout can be used in the wizard procedure. Pin clamps reference the face of the brake rotor for locating targets. Pin clamps get their name from the fact that they use five slender pins to protrude through factory cut holes in the wheel designed specifically for this purpose. Hub clamps reference the edge of the wheel hub. Most applications however will call for the standard clamp.



Step 3. Choose the Target to Perform ID

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



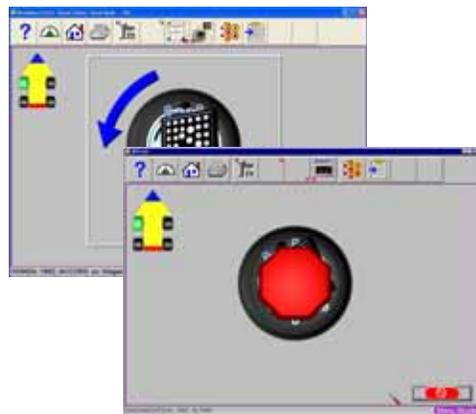


Step 4. Place the Target on the Corresponding Wheel
An instruction screen appears asking to place the desired target on the wheel on the side of the vehicle it is normally on.

NOTE: The Clamp/Target assembly must be mounted on the wheel it is normally used on.

Step 5. Install the Steering Wheel Holder

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



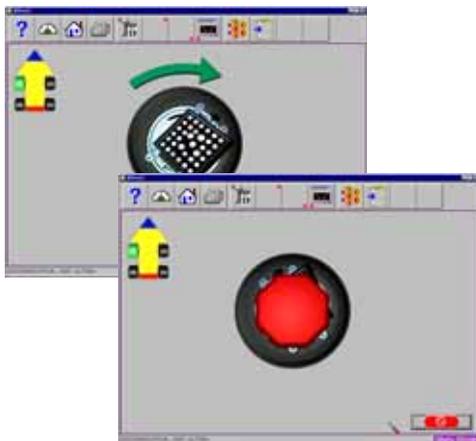
Step 6. Raise the Axle of the Vehicle to be ID'd

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

NOTE: Rigid supports must be used to prevent assembly wobble.

Step 7. Rotate the Wheel/Target Forward

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



Step 8. Rotate the Wheel Back

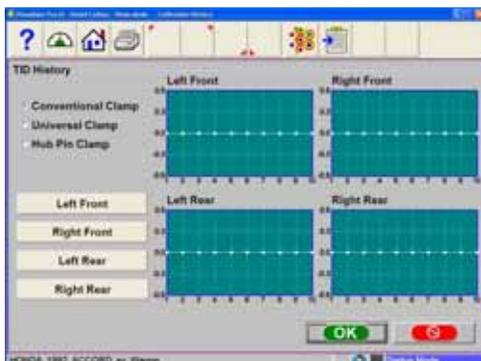
Following the on-screen arrows, rotate the wheel/target back (about 90 degrees) until the stop sign appears. Hold steady while the stop sign is displayed until the software takes its readings and automatically advances.

Step 9. Rotate the Wheel/Target Forward

Follow the on-screen arrows instructing you to rotate the wheel/target forward (about 60 degrees) until a stop sign appears. Hold steady while the stop sign is displayed until the software takes its readings and automatically advances.

Step 10. Lower the Vehicle

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



Target ID History

When toolbar button #5 (F5 key) is selected during the Target ID process the Target ID history is displayed. For each target, the screen shows the Installed Target ID date (when the software was loaded) and the date the current Target ID was performed. Click OK to return.

12 - Check Camera Tracking

Put a car on the lift, install targets and adjust the pod aim levers so that the front and rear targets are centered horizontally. From camera Manual Mode go to Target Search Mode and the cameras should find and center the targets in 5 or 6 moves. The cameras should also track the targets if the lift is raised or lowered

13 - Finalizing the Installation

1. Inspect all connections for proper contact both mechanical and electrical.
2. Make sure cable slides are in place and are properly installed for camera pods.
3. Raise and lower the lift several times and make sure the system operates as intended in the “Target Search Mode”.
4. Perform an alignment, preferably with a vehicle of known integrity, verify results. Refer to service instructions to address any discrepancies incurred at this point.

14 - System training

Spend time with our new customer going over the software flow and operation of his/her new system. A few minutes here will save hours later for both you and the technician. Things to cover are outlined but not limited to the items below:

- ⇒ System features and specifications
- ⇒ Proper system start-up and shut down
- ⇒ Windows operation (if he has a desktop mode activated)
- ⇒ Software navigation
- ⇒ Setup, system interaction, preferences, features
- ⇒ Using Wizards
- ⇒ Perform an alignment
- ⇒ Navigation of the Arago 3™ Ultra Pro32 software features



USA

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