

WinAlign[®] Alignment Software

Version 9.0 Operation Manual



Contents

HELP TIPS	1
Inside WinAlign Alignment Software	1
Inside Help Tips.....	2
Using the HELP Buttons	3
Selecting a Topic	4
Searching Help	4
1. GETTING STARTED	5
1.1 General Introduction.....	5
References.....	5
1.2 System Requirements	5
1.3 For Your Safety - Hazard Definitions	5
IMPORTANT SAFETY INSTRUCTIONS.....	6
SAVE THESE INSTRUCTIONS	6
Precautions for Systems Equipped with HFSS Cordless Sensors	7
Specific Precautions/Power Source.....	7
North America.....	7
Other Regions	7
Equipment Specifications.....	8
Electrical	8
Atmospherics	8
Safety Summary	8
1.4 Operating the Console	9
Turning Console Power On.....	9
Turning Console Power Off.....	9
Using the “Softkeys”.....	10
Alignment Procedure Bar.....	12
Using the Virtual View™ Adjustment Feature.....	12
Virtual View Angle Selector	14
SoundGuide™ Tone Feedback System	16
AlignGuide™ Training and Information Guide	16
Resetting the Program	17
Just-In-Time Training Video Instructions	18
Using the Screen Saver	18
1.5 Using the Remote Control.....	19
Sensor Compensation Display Using the Remote Control (Camera Sensors Only).....	20
Measure Caster Display Using the Remote Control.....	20
Alignment Values Display Using the Remote Control	20
Selection of Alignment Values to Display Using the Remote Control.....	20
Identification of Values Displayed and Bar Graphs Using the Remote Control.....	22
Examples of Alignment Displays Using the Remote Control.....	23
Recording Measurements (Plus Model Only) Using the Remote Control	24
Display of Measurements Using the Remote Control - Value Displays	25
Remote Control Indicators.....	26
Storing Measurement Values Using the Remote Control	27
Tire Temperature Readings Using the Remote Control.....	28
Tire Pressure Readings Using the Remote Control	29
Tire Tread Depth Using the Remote Control.....	29
Frame Angle Using the Remote Control	30
Reviewing and Editing Stored Values Using the Remote Control	30

Remote Control Summary / Transmit Button	31
Ride Height Using the Remote Control	32
Using the Standard Remote Control	32
1.6 An Example Alignment Job with the ExpressAlign Adjustment Feature and DSP400/DSP600 Sensors	33
Example 1 (ExpressAlign® / DSP400/DSP600)	33
Example 2 (ExpressAlign® / DSP400/DSP600)	41
1.7 An Example Alignment Job with the ExpressAlign® Adjustment Feature and without DSP400 or DSP600 Sensors.....	52
Example 1 (ExpressAlign® / without DSP400 or DSP600)	52
Example 2 (ExpressAlign® / without DSP400 or DSP600)	58
2. BASIC OPERATION INFORMATION	65
2.1 Sensors and Targets	65
Mounting Sensors or Targets Onto Wheel Adaptors	65
Wheel Adaptor 175-285-1	66
Wheel Adaptor 175-321-1 with Ratchet Adaptor Locking Lever	66
Operation of Ratchet Adaptor Locking Lever after Initial Setup	67
Mounting Wheel Adaptors Onto Wheels.....	68
Wheels With No Rim Lip (Attaching To Outer Rim Lip)	68
Wheels With Rim Lip (Attaching To Inner Rim Lip)	68
Connecting Conventional Sensor Cables	69
Connecting Sensor Cables With Optional Rack Wiring Kit.....	69
Connecting Sensor Cables Without Optional Rack Wiring Kit.....	69
Compensating Conventional Sensors - General Compensation of Conventional Sensors	70
Compensating Conventional Sensors - 3-Point Compensation	70
Compensating Conventional Sensors - 2-Point Compensation	72
Rolling Compensation for Conventional Sensors	73
Rolling Compensation for Conventional Sensors - 3-Point Procedure.....	73
Rolling Compensation for Conventional Sensors - 2-Point Procedure.....	74
Procedure Limitations.....	75
Compensating DSP400/600 Targets - General Compensation.....	75
Compensating DSP400/600 Targets - About Rolling Compensation	75
Perform a vehicle inspection before beginning alignment	75
Practices to follow for best results	76
Compensating DSP400/600 Targets - DSP400/600 Rolling Compensation	76
Roll-Check® Measurement Feature	80
Jacking Compensation.....	81
2.2 Vehicle Specifications	83
Primary and Secondary Specification Groups	84
Vehicle Specification Memory.....	84
Vehicle Recall Specifications Selection.....	86
Selecting from the Vehicle Lists	86
Selecting by Vehicle Identification Number (VIN)	87
Selecting "User Specifications"	88
Editing Specifications - Entering and Editing Specifications.....	88
Selecting Specification Formats	89
Reducing Tolerances.....	90
Storing Specifications - Specification Notes	91
Storing Specifications - Storing "User Specifications"	92
Storing Specifications - Deleting "User Specifications"	94
Factory Amended Specifications.....	94
WebSpecs.Net™ Online Specification Database	95
WebSpecs Hardware and Software Requirements.....	96
WebSpecs User Authorization	96
WebSpecs Installation Instructions	96
Accessing WebSpecs.Net (Aligner Console)	97
Downloading Specifications	98
Viewing Adjustment Illustrations in WebSpecs	100
Parts Inspection.....	100

Printing WebSpecs Adjustment Illustrations	101
Recalling Saved WebSpecs	101
Deleting Saved WebSpecs	101
Using WebSpecs on remote PC's.....	102
Downloading WebSpecs to Floppy Disk	103
Uploading WebSpecs	104
Need A Spec	105
Selecting Display Units	105
Printing Specifications.....	107
2.3 Vehicle Measurements and Adjustments	107
Vehicle Plan View Status Indicator	107
Target Blockage	108
Sensor Troubleshooting	109
Spoiler Mode (Only applies to DSP508 or DSP508-XF Sensors)	110
Showing Measurements	110
Bar Graph Adjustments.....	111
Bar Graph Groups	112
Context Sensitive Menu	114
Zero Adjustments	115
Showing and Selecting Front and Rear Axles	115
Adjusting With Axles Raised	115
Adjusting with Axles Raised Using Jack Detect™ Feature	117
Wheel-Off Adjust Feature	118
Accessing “Adjust with Wheel Off” Procedure within WinAlign	118
Wheel-Off Adaptor Installation	119
Standard Bolt-on Wheel-Off Adaptor Installation.....	119
Wheel-Off Adaptor Installation Using the Optional Magnet Assembly Kit, 20-1979-1	119
Re-Install the Sensor or Target.....	121
Saving “Before” Measurements	123
Control Saved Measurements	124
Showing “Current” Measurements	124
Showing “Before” Measurements.....	124
Saving “Current” Measurements as “Before” Measurements	125
ExpressAlign® Alignment Adjustment System	125
2.4 Alignment Procedure.....	129
Adjustment Order	129
Selecting the Procedure.....	129
DSP400/600 Alignment Reference	130
Controlling Sensor Compensation	130
Measuring Caster, S.A.I., and Included Angle.....	130
Measuring Caster.....	132
Measuring S.A.I. and Included Angle	134
Measuring Caster and S.A.I./I.A. Simultaneously (FasterCaster®).....	136
Live Caster.....	137
Lock-Check® Sensor Checking Feature	137
2.5 Additional Measurements	138
Frame Angle Measurements.....	138
Measuring Ride Height	138
Measuring Ride Height Using the Ride Height Tool.....	140
Measuring Ride Height Using the Keyboard	141
Measuring Ride Height Using the Ride Height Remote	142
Measuring Ride Height Using Ride Height Targets	144
Installing the Ride Height Targets	144
Virtual View Live Ride Height.....	145
Live Ride Height	147
Measuring Ride Height Using the Romess Inclinator for Mercedes	149
Ride Height Bar Graphs	149
Cross Ride Height	150
Ride Height Dependent Specifications.....	150
Zoom	151

Printing Ride Height.....	151
Symmetry Angle/Set Back Measurements	152
Set Back Procedures.....	152
Toe-Out-On-Turns	154
Maximum Steering Angle.....	157
Tire Condition.....	159
Bump Steer Measurement.....	163
Toe Raised Procedures	167
V.A.G. Flowchart	172
Tire Information.....	173
Wheelbase and Track Width Measurements.....	174
Suspension Body Dimension Audit (SBDA)	175
2.6 Illustrating Vehicle Adjustments	178
2.7 Rear Adjustments	180
Rear Shims	180
Using the Shim-Select® II Program.....	180
Using Non-adjustable 1-Piece Shims	181
For Full Contact/Dual Angle Shims (Original Hunter/Northstar Design).....	182
Using Adjustable 2-Piece Shims.....	182
For System “2000” Hunter/Northstar Shims	183
Overriding the Recommended Shim.....	183
Adjusting the Shim Display Size	184
Selecting the Default Shim Brand.....	184
Setting Up Rear Shims	184
Contacting Shim Manufacturers	184
2.8 Front Adjustments	185
Front Shims.....	185
CAMM® (Control Arm Movement Monitor) for Front Cams and Slots.....	187
WINTOE® Toe Adjustment System.....	191
Automatic Bushing Calculator® Adjustment Feature	195
2.9 Print Selections	200
Print Preview Feature	201
Print Symptom Report.....	202
Printing the Vehicle	203
Print Summary	204
Print Specifications and Print Measurements.....	204
Print Bar Graphs	205
2.9 Online Features.....	206
ShopResults.NET™	206
Setting Up ShopResults.NET™	206
Sending Alignment Results from to the Hunter Web Server.....	207
Sending Alignment Results	208
Logging On to ShopResults.NET™ Online Service	208
Editing the ShopResults.NET™ Email	209
Viewing Results before Sending the Email	209
How the Email Works	210
Email Recipient Viewing Results in a Web Browser	210
Uploading Results	211
Repair Shop Viewing Previously Saved Results.....	212
Shop Identification	213
Reports	213
HunterUser.COM Web Site.....	214
Hunter Web Site.....	215
3. WINALIGNTUNER™ ALIGNMENT PROCEDURE	217
WinAlign_{Tuner}™ Overview	217
WinAlign_{Tuner}™ Setup	218
WinAlign_{Tuner}™ Procedure	219
WinAlign _{Tuner} ™ Options	219
Performing a Vehicle Alignment with WinAlign _{Tuner} ™	222

4. ALIGNER SET-UP.....	237
4.1 Set-Up.....	237
Factory Settings for Aligner Set-Up	238
4.2 Display	239
Setting up the Display Language	239
Setting up the Logo Screen Advertising Message	240
Setting up the Logo Screen	240
Setting up the Dynamic Window Open Effect.....	241
Setting up the AlignGuide® Feature.....	241
Setting up the Web Site Address	242
4.3 Alignment Procedures.....	242
Setting up the Common Alignment Preferences.....	242
Setting Vehicle Specific Alignment Preferences.....	243
Setting up ShopResults.NET™.....	244
Setting up the ExpressAlign®/Power Tool Preferences	244
Setting up the Alignment Procedure	245
Setting up the Alignment Procedure Automatic Selection	246
Setting up the Alignment Measurement Units and Formats	247
About Units	248
About Formats	249
Setting up the Caster Measurement Selection	249
Setting up the Reduce Number of Softkeys: Enable/Disable	250
Setting up the Set Vehicle Selection Options	250
Default Vehicle Specification	251
4.4 Bar Graphs.....	251
Setting up the Front Axle Bar Groups	251
Setting up the Rear Axle Bar Groups	252
Setting up the Cross Bar Graph/Additional Cross Angles: Enable/Disable	252
Setting up the Show Specs on Bar Graphs: Enable/Disable	253
4.5 Printer.....	254
Setting up the Printer	254
Setting up the Print Language	255
Setting up the Printout Advertising Message.....	255
Setting up the Print Warning Message: Enable/Disable	256
Setting up the Report Format.....	256
Setup Default Printout.....	257
Custom Print Header	258
Setup Print Preview	262
4.6 Sensors	262
Setting up the Sensor Type	262
Setting up the Toe-Out-On-Turns Device	263
Updating the Remote Indicator Software	263
Updating the Sensor Software	265
Setting up the Conventional Sensors Compensation Options.....	266
Setting up the Alignment Bay Configuration	266
Setting up the DSP400/600 Alignment Reference.....	267
Setting up the DSP400/600 Compensation Procedure	267
DSP400/600 Emitter Flash Mode	268
Setting up the DSP600 Lighting Mode.....	268
DSP600 Calibration Check Reminder	269
Setting up the Cordless Channel Selection	269
Scanning HF Channels	271
Setting HF/HFSS Channel	272
Setting up the Cordless Channel for the Wireless Remote Indicator	273
Setting the Conventional Sensor Calibration Reminder	274
4.7 Power Tools.....	275
Setting up the Rear Shim Default Brand.....	275
Setting up the Rear Shim Display Size.....	275
Setting up the Front Bushing Default Brand	276
Setting up Virtual View.....	276

Setting up Virtual View Caster Steer	277
Setting Up Virtual WinToe®	277
Setting up Live or Manual Ride Height	278
Setting up Tools and Kits Internet Ordering.....	278
4.8 Inspection	279
4.9 Date and Time.....	279
Setting up the 12 or 24 Hour Clock Display	280
Setting up the Date Format.....	281
4.10 Aligner Equipment	281
Setting up the Remote Control Channel	281
Setting up the Select Logging Type.....	282
Setting up Shutdown Windows on Exit.....	282
4.11 Transmitting Measurements	283
Setting up the Transmit Measurements Destination.....	283
Setting up the Transmit Measurements Format	283
4.12 Work Management	284
Setting up the Work Order Format.....	284
Setting up the Custom Work Order Format	285
4.13 Logon	287
Setting up the Logon Option	287
Setting up the Logon Registry.....	288
Setting up the Logon Password	290
Setting up Automatic Backup Options	291
4.14 Tread Depth	292
Setting up the Defined Tread Depth Specification.....	292
5. DETAILED OPERATION INFORMATION	293
5.1 Primary and Popup Screens	293
5.2 Log On.....	294
Types of Log On.....	294
Manager Log On.....	295
User Log On	295
Setup Items	295
Logging On.....	295
Logging Off.....	296
Log On Registry	296
Log On Password	296
5.3 Work Management Database	297
Work Management Overview.....	297
Custom Forms (Default Format)	298
Entering Customer Information	298
Edit Customer Identification in Custom Forms.....	298
Edit Work Order in Custom Forms	299
Listing Work Orders.....	301
Adding a New Vehicle to a Customer ID	302
Saving the Current Work Order in Custom Forms	302
Switching Between Reference and Current Work Orders in Custom Forms.....	302
Exporting a Work Order in Custom Forms	303
Deleting a Work Order in Custom Forms	303
Managing the Database.....	303
Format 1	303
Entering Customer Identification	303
Edit Customer Identification	304
Edit Work Order.....	305
Adding a Note.....	306
Recalling a Customer/Vehicle.....	307
Saving the Current Work Order	308
Recalling a Work Order	309
Switching Between Reference and Current Work Orders.....	309
Managing the Customer Database.....	310
Adding a New Customer.....	310

Adding a New Vehicle to a Customer.....	312
Changing Customer.....	313
Deleting a Customer.....	314
Deleting a Vehicle.....	314
Deleting a Work Order.....	315
Filtering Data	316
Creating a Filter	318
Recalling a Filter	318
Editing Criteria	318
Creating Form Letters	319
Printing Form Letters.....	321
Charting Alignments	322
Exporting Customer Database Files.....	323
Importing DBF Files.....	324
5.4 Keyboard Simulator.....	324
Enabling and Disabling	324
Selecting a Sensor.....	324
Compensating a Sensor	324
Measuring Caster.....	324
Changing Camber of a Sensor	325
Changing Toe of a Sensor.....	325
Steering an Axle.....	325
Changing Caster Adjust of a Sensor	325
Changing Caster and Camber Adjustment of a Sensor with Control Arm Movement	325
Measuring Ride Height of a Sensor.....	325
Changing Battery Charge of a Sensor.....	325
Steering to a Preset Angle.....	325
Miscellaneous Controls.....	325
Resetting the Keyboard Simulator	326
5.5 Vehicle Inspection	326
Point and Click Inspection Mode	326
Entering Vehicle Inspection	326
Setting the Status in “Point and Click” or “Inspection Parts List”	327
Context Sensitive Menus for “Point and Click” or “Inspection Parts List”....	328
MAP Inspection Videos	329
Sorting Options/Category	329
Printing Inside “Point and Click”	330
Parts List Inspection Mode.....	330
Selecting the Inspection Group & Sub-Groups.....	330
Show All Modes.....	331
Printing Selected Items and Illustrations	332
Including Illustrations in Printouts.....	332
Adding Notes to Printouts.....	333
Sample Printout.....	333
Sorting by Illustration.....	334
Sorting by Part Name	334
Toggling to the Parts List Screen	335
Toggling to “Point and Click” Inspection.....	335
Motorist Assurance Program (MAP) Guidelines	335
Using MAP.....	335
Printing the Inspection Report.....	336
Cradle Inspection	337
5.6 AllData® Undercar	337
5.7 Tools and Kits	338
Accessing Tools and Kits.....	339
Tools and Kits Screens	340
Changing the Angle	341
Using Tools and Kits Videos.....	342
Selecting Tools and Kits Manufacturers	343
Ordering Tools and Kits Online.....	344

Printing Reports	346
Print Tools and Kits List Reports	347
Print Tools and Kits List and Pictures Reports	348
5.8 On-The-Job-Training	348
Training Videos	350
5.9 i•SHOP Standards	351
i•SHOP Overview	351
What are the i•SHOP Standards	351
Where is i•SHOP found	351
i•SHOP Scenario	351
Front Shop	352
Back Shop	352
Front Shop	353
Back Shop	353
Front Shop	354
5.10 ASANetwork Manager	354
5.11 VideoTech	356
VideoTech Overview	356
Accessing VideoTech	356
Playing a VideoTech Video	357
Video Controls	357
VideoTech Instructional Videos	358
5.12 Transmitting Measurements for Auditing	359
Transmitting Measurements in the C111 Format- Partial Measurements C111 Format A	362
Transmitting Measurements in the C111 Format- Partial Measurements C111 Format B	364
6. EQUIPMENT INFORMATION	365
6.1 Conventional Sensors	365
Care and Cleaning of the Conventional Sensors	365
RF*STIK	365
HF Pod	365
XF Pod (DSP506XF and DSP508XF Sensors Only)	366
XF2 Pod (DSP506XF and DSP508XF)	366
Precautions for Systems Equipped with XF Cordless Sensors	367
Charging Conventional Sensor Batteries (RF and HF/HFSS Sensors Only)	367
Charging Conventional Sensor Batteries (XF Sensors Only)	369
6.2 DSP400/600 and Ride Height Targets Care and Maintenance	372
Target Maintenance	372
Camera Maintenance	372
Care and Cleaning of the Targets	373
Ride Height Target Maintenance	373
Target Mounting Surface Cleaning Instructions	373
DSP400L/600L Vertical Lift Control Unit	374
Preset Keys	374
Safety Switches	375
DSP600LP Lift Controls	375
6.3 Remote Indicator	375
LED	375
Remote Indicator Models 30-418-1, 30-419-1, and 30-421-1	375
6.4 Digital-PHOTO Option	376
6.5 CD/DVD-ROM Handling Instructions	376
Replacing the CD/DVD-ROM in Systems That Have Tray Type Players	376
6.6 Mouse	376
6.7 Remote Control Transmitter	376
6.8 Program Shell	377
Customizing with Program Shell	377
6.9 WinAlign Multi-disk Backup/Restore	380
Backup and Restore Procedures	381
Backup Procedure	381

Restore Procedure	383
6.10 Electronic Keys	384
6.11 Conventional Sensor Calibration	384
Calibration General Information	385
Mounting DSP Sensors.....	385
Leveling the Calibration Fixture	387
Starting the Calibration Procedure.....	388
Procedure Basics	388
Selecting What to Calibrate	389
Performing the Calibration (Conventional Sensors)	391
Mounting Prisms for Toe Transducers (DSP100, 200, 250 Series Sensors)....	392
Mounting Spacers for Camber and Caster Adjust Transducers (All Sensors) ..	392
Compensating Sensors for Runout (DSP100, 200, and 250 Series Sensors) ..	392
Zero Calibration	393
Storing Calibration Results	393
Finishing Calibration	393
Calibration Fixture Adjustments.....	394
Adjusting Cams for DSP100, 200, and 250 Series Sensors	394
Mount the sensors on the calibration fixture.....	394
Leveling the Top Casting.....	395
Zero Calibration Using the Long Calibration Bar	395
Software Requirements	395
DSP Sensor Preparation	395
Installing the Calibration Bar and Stands	396
Stabilizing the Calibration Stand	397
Mounting the DSP Sensors	397
Rotating the Calibration Bar	397
Raising the End of the Calibration Bar (DSP500 Series Sensors).....	398
Performing the Zero Calibration	399
Reverse Sensor Test.....	399
6.12 DSP400/600 Sensor Calibration	400
6.13 DSP400/600 Sensor Calibration Check Procedure.....	400
7. ADDITIONAL INFORMATION	405
7.1 Cradle Adjustment	405
Why has the “cradle” become an alignment issue?	405
Is it possible to reposition a cradle without frame equipment?	405
What are the procedures for properly positioning a cradle assembly?	406
Definition of Cradle	406
Why are cradle assemblies used?	406
What is the proper position for the cradle?	406
What happens if the cradle is out of position?	406
Vehicles with Adjustable Cradles by Manufacturer.....	407
Front Adjustable Cradles.....	407
Buick	407
Cadillac	407
Chevrolet.....	407
Chrysler.....	408
Dodge.....	408
Ford.....	408
Lincoln-Mercury	408
Oldsmobile	408
Plymouth	408
Pontiac	408
Saturn.....	408
Vehicles with Adjustable Rear Cradles	408
Camber and Steering Axis Inclination (S.A.I.) Angles	409
How does the cradle position effect camber and S.A.I.?	409
What are the affects of an improperly positioned cradle?	410
Caster and Setback Angles	410
How does the cradle position effect caster and setback angles?	411

7.2 Ride Height Specifications.....	412
Toe Change	412
Camber (Side-Slip)	412
Shocks and Struts.....	412
Rear Springs.....	412
8. GLOSSARY	413
8.1 Alignment Types	413
Geometric Centerline Alignment.....	413
Thrust Line Alignment.....	413
Total Four-Wheel Alignment.....	414
8.2 Alignment Angles and Measurements.....	414
Camber	414
Caster.....	415
Frame Angle.....	415
Geometric Centerline	415
Included Angle (I.A.)	416
Individual Toe.....	416
Ride Height	416
Steering Axis Inclination (S.A.I.)	417
Thrust Angle and Thrust Line.....	417
Total Toe	418
Turning Angle.....	418
Symmetry Angle/Set Back Definitions	418
Front Set Back.....	419
Rear Set Back	419
Wheelbase Difference	419
Right Lateral Offset.....	420
Left Lateral Offset.....	420
Track Width Difference.....	421
Axle Offset.....	421

HELP Tips

Inside WinAlign Alignment Software

The following licensed names are trademarked products and processes within WinAlign® software that have had registration applied for (™) or are legally registered (®).

AlignGuide® Alignment Training Guide
AllData® Undercar Technical Service Diagnostic and Maintenance Tool
Automatic Bushing Calculator® Alignment Adjustment Feature
Cal-Check® Sensor Calibration Accuracy Feature
CAMM® Alignment Adjustment System
DSP Alignment® Sensor Technology
ExpressAlign® Alignment Adjustment System
FasterCaster® Alignment Measurement Feature
JackDetect™ Jacking Detection System
Level Reminder® Sensor Accuracy Check
Lock-Check® Alignment Measurement Feature
PartHunter® Database
Picture Perfect® Alignment
Pro-Comp® Sensor Compensation System
Roll Check® Alignment Measurement Feature
Shim-Select® II Alignment Adjustment System
ShopResults.NET™ Online Service
SoundGuide® Tone Feedback Feature
Targets® DSP400 Target (Design)
Video Tech® Alignment Video Training Feature
Virtual View™ Alignment Feature
WebSpecs® Online Alignment Specification Database
WinAlign® Alignment Software
WINTOE® Alignment Adjustment System

Inside Help Tips

The “HELP” key accesses an on-line, context-sensitive copy of this manual. The “HELP” softkey label is available on all screens, usually located in the **K4** key of the lowest menu level. If the “HELP” softkey is not present, press **ESC** until it appears.

When **K4** is pressed, a popup screen appears with the question “What kind of help would you like?” The choices are:

“Cancel” will close the popup and return the screen where “HELP” was pressed.

“Just-In-Time Training” will open a popup screen that can be useful to train technicians. “Just-In-Time Training” is optional multimedia video instructions.

“Table Of Contents” will open a popup screen with the table of contents of the “Help Manual.”

The softkey label for **K4** will be “About nnnnnn,” and will refer to the topic or procedure of the screen from where “HELP” was pressed.

Pressing **K4** will open the Help Manual directly to the reference section for that topic.



Using the HELP Buttons




WinAlign® HELP has seven buttons at the top of the Help window.



To select these buttons, click on the button with a light pen or mouse, or press the letter on the keyboard corresponding to the underlined letter of the button label.

C ontents	The Table of Contents will appear.
I ndex	A popup screen will appear. A key word or phrase can be entered from the keyboard or selected from the list provided. Click on the “Display” button with a light pen or mouse, or press “Enter,” and an explanation of the word or phrase will appear.
F ind	Opens up a separate Index window.
H elp Topics	Opens or closes the Help Tabs pane.
B ack	The path taken through the Help topics will be retraced.
P rint	Prints the current topic.
O ptions	Accesses customizable options such as font size.
<	The previous topic in a series of topics will appear. When the first topic in the series is reached, the button will dim.
>	The next topic in a series of topics will appear. When the last topic in the series is reached, the button will dim.

When the Help Topics button is pressed a navigation pane will appear on the left side of the help window. Three tabs will be available.

 C ontents	Displays the entire table of contents for easy navigation.
 I ndex	Displays a comprehensive list of words and topics for browsing.
 S earch	Displays a search pane to search the entire help manual.

The contents of the HELP topic may not fit inside the window. When this occurs, a scroll bar is provided on the right side of the window.

One of the following methods may be used to scroll through the information:

- Click on one of the scroll arrows.
- Drag the scroll box to scroll quickly.
- Use the cursor arrow keys on the keyboard to scroll up or down.
- Use the page up or page down keys on the keyboard.
- Click above or below the scroll box in the scroll bar.

Selecting a Topic

Some topics in the HELP file include text that is linked to other HELP topics. These links are called jumps.

Jump text is usually green and underlined. When you point to a jump, the arrow turns into the shape of a hand.

To select a jump:

Press “Tab” to highlight the text, then press “Enter.” Press “Shift” and “Tab” to highlight previous jump text.

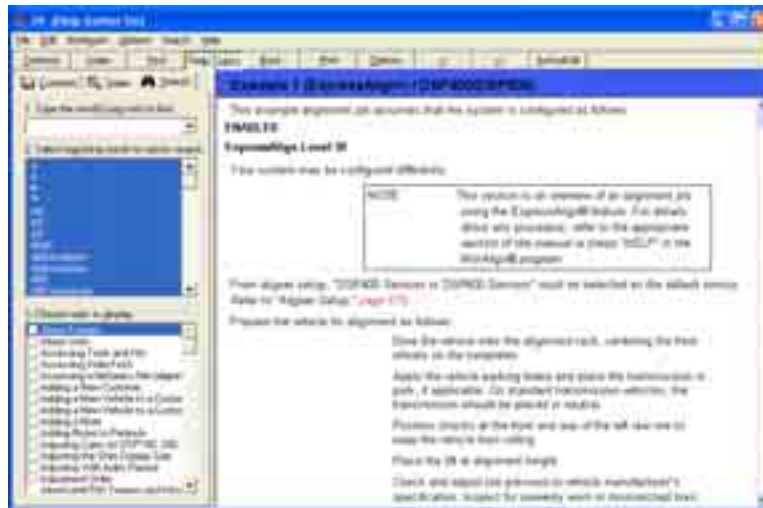
OR

Move the arrow to the jump text, and click with a mouse or light pen.

The topic will appear in the HELP window.

Searching Help

Select the “Search” tab to access the Help Index. The Search window will appear left of the Help window. Type a search word to search the list of headings. Click on the desired subject and it will appear in the main help window.



1. Getting Started

1.1 General Introduction

This manual provides operation instructions and information required to operate the 811 aligner with WinAlign® software. WinAlign® software version 9.0 is a 32-bit program and is compatible only with Windows® 2000 or above.

The owner of the Series 811 aligner is solely responsible for arranging technical training. Only a qualified trained technician should operate the Series 811 aligner. Maintaining records of personnel trained on this equipment is solely the responsibility of the owner and management.

References

This manual assumes the user is already familiar with the basics of wheel alignment. “Italics” are used to refer to specific parts of this manual that provide additional information or explanation. For example, *Refer to “Operating the Console.”* These references should be read for additional information to the instructions being presented.

1.2 System Requirements

WinAlign® software version 9.0 is a 32-bit program and therefore is compatible with only Series 811 Aligners.


Required Software that will be installed by the WinAlign® software 9.0 Installer:

Microsoft® DirectX® 9.0c


Intel Display Adapter Driver Version 6.14.10.3762

1.3 For Your Safety - Hazard Definitions

These symbols identify situations that could be detrimental to your safety and/or cause equipment damage. Watch for these symbols:

 CAUTION: Hazards or unsafe practices, which could result in minor personal injury or product or property damage.

 WARNING: Hazards or unsafe practices, which could result in severe personal injury or death.

 DANGER: Immediate hazards that will result in severe personal injury or death.

IMPORTANT SAFETY INSTRUCTIONS

Read and follow all caution and warning labels affixed to your equipment and tools. Misuse of this equipment can cause personal injury and shorten the life of the aligner.

Always use wheel chocks in front of and behind the left rear wheel after positioning a vehicle on the rack.

Use caution when jacking the vehicle.

ALWAYS WEAR OSHA APPROVED SAFETY GLASSES. Eyeglasses that only have impact resistant lenses are NOT safety glasses.

Wear non-slip safety footwear when performing an alignment.

Never stand on the aligner.

Do not wear jewelry or loose clothing when performing an alignment.

Wear proper back support when lifting or removing wheels.

Do not operate equipment with a damaged cord, or equipment that has been dropped or damaged, until a Hunter Service Representative has examined it.

Never use the cord to pull the plug from the outlet. Grasp plug and pull to disconnect.

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 current than the equipment may overheat. Care should be taken to arrange the cord so that it will not be tripped over or pulled.

Verify that the electrical supply circuit and the receptacle are properly grounded.

To reduce the risk of electrical shock, do not use on wet surfaces or expose to rain.

Verify that the appropriate electrical supply circuit is the same voltage and amperage ratings as marked on the aligner before operating.


To reduce the risk of fire, do not operate equipment in the vicinity of open containers of flammable liquids (gasoline).


Keep all instructions permanently with the unit.


Keep all decals, labels, and notices clean and visible.

To prevent accidents and/or damage to the aligner, use only Hunter recommended accessories.

Use equipment only as described in this manual.

 **WARNING:** This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instruction manual, it may cause interference with electronic devices. Operation of this equipment in a residential area may cause interference in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.


 **CAUTION:** Do not turn the power off when the disk drive is operating. The disk can be damaged.


 **WARNING:** DO NOT ALTER THE ELECTRICAL PLUG. Plugging the electrical plug into an unsuitable supply circuit will damage the equipment and may result in personal injury.

SAVE THESE INSTRUCTIONS

Precautions for Systems Equipped with HFSS Cordless Sensors

The following precautions apply to the HFSS transceivers installed in the aligner console and the alignment sensors as part of the HFSS cordless sensor option.

 **WARNING:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

 **WARNING:** Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.


Specific Precautions/Power Source

North America

The PC aligner is intended to operate from a power source that will apply 120 VAC (nominal) 50/60 Hz between the supply conductors of the power cordset.

Other Regions

The PC aligner is intended to operate from a power source that will apply 230 VAC (nominal) 50/60 Hz between the supply conductors of the power cordset. The power supply cordset, supplied with this equipment, may need modification to allow connection to the power supply mains. Your Hunter service representative will install the proper plug for your location.

 **CAUTION:** A protective ground connection, through the grounding conductor in the power cord, is essential for safe operation. Use only a power cord that is in good condition.

FUSING:

To avoid fire hazard, use only the fuse specified for your product.

EQUIPMENT SERVICE:

This equipment contains no user serviceable parts. All repairs must be referred to a qualified Hunter Service Representative.

PROVISIONS FOR LIFTING AND CARRYING:

No provision has been made for lifting or carrying this equipment. The unit must be moved by rolling it on its casters.

Equipment Specifications

Electrical

VOLTAGE:	120/230 volts (nominal)
AMPERAGE:	6/3 amps
WATTAGE:	720 watts









Atmospherics

TEMPERATURE:	+32°F to +122°F (0°C to +50°C)
RELATIVE HUMIDITY:	Up to 95% Non-condensing
ALTITUDE:	Up to 6000 ft. (1829 m)

Safety Summary

Explanation of Symbols

These symbols appear on the equipment.

	Alternating current.
	Earth ground terminal.
	Protective conductor terminal.
	ON (supply) condition.
	OFF (supply) condition.
	RISK of electrical shock.
	Stand-by switch.
	Not intended for connection to public telecommunications network.

1.4 Operating the Console

Individual consoles will vary due to specific model number and production date. Detailed console-specific instructions will be included with the aligner console.

Turning Console Power On

Turn the unit “ON” by pressing the power switch located on the left side panel, or on the back panel of the aligner cabinet.

The “Logo” screen will appear and indicate that the unit is ready for use. This will take approximately 1.5 minutes.



Turning Console Power Off

To turn off the aligner power, do the following:

Turn off cordless sensors. (Each sensor has a power switch.)

Reset the console.

Press “Exit Aligner.” A “Confirmation” popup screen will ask if you are sure you want to exit the aligner. Press “Yes.”

Wait for the aligner program to end. The aligner will shutdown automatically.











Turn off console power.







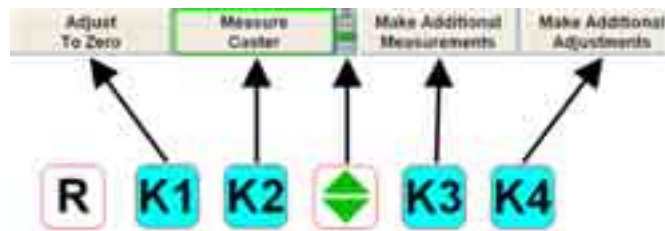
CAUTION: Do not turn off the power while information is being written to the disk drive. This occurs during console setup and when specifications are being stored. This can result in corrupt disk drive files.

Using the “Softkeys”



The softkeys, located on the keyboard, provide operator control of the program. These keys are identified as:



-  K1 key
-  K2 key
-  K3 key
-  K4 key
-  Menu shift key
-  Reset key
-  Forward key
-  Backward key
-  Zoom key (keyboard)
-  Zoom softkey (screen display)

The four labels that appear at the bottom of each screen are referred to as the softkey labels. These labels indicate the action that the program will take when the corresponding , , , or  key is pressed.






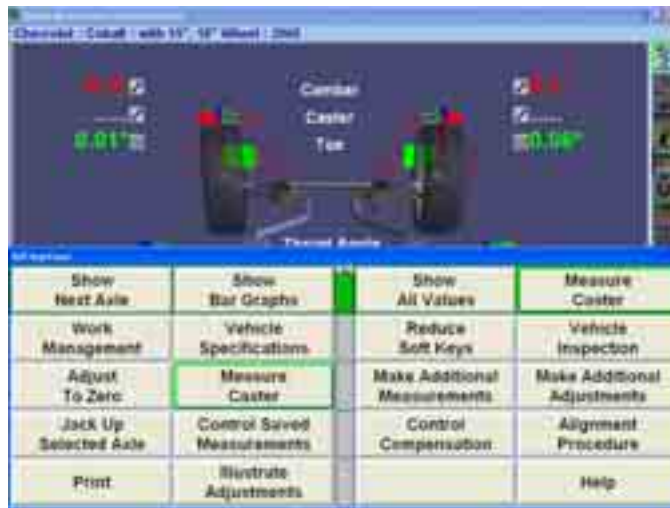
The vertically stacked squares between the “K2” and “K3” labels indicate how many levels of softkeys are available. The highlighted box indicates the menu level that is currently displayed.

The softkey level is changed by pressing the menu shift softkey, . When this key is pressed, the softkey labels will change to the next level “down.” If the last menu level is currently displayed, the softkey level will be the first softkey level. To go to the next softkey level “up,” press “Shift” and .


Pressing “Shift” and  will zoom the current softkey level to a full screen version as seen below. The softkeys associated with the softkey label are shown on the left side of the labels and the softkey level is indicated on the right side of the labels. Pressing  again will cause the softkey level to return to the original view.



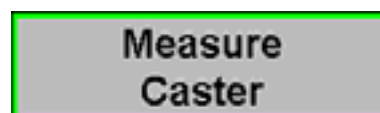
Pressing , or selecting  above the softkey levels, or pressing and holding with a pointing device on the menu level indicator will cause all of the menus available to appear, as seen below. The green background indicates the active menu level. Pressing  again will cause the menu to return to the original perspective.



The number of softkeys displayed may be reduced to only the number of softkeys needed for a typical alignment by enabling “Reduce Number of Softkeys” in “Aligner Setup.” Refer to “Aligner Setup.”

Throughout this manual, the statement Press “nnnnnnn” indicates the label of the softkey to press. If the required label is not on the current menu,  must be pressed to change menu levels until the desired label is displayed.

Some softkey labels have a green border highlight around the softkey. Generally, the softkey with the green border (usually “K4”) is the appropriate key to press to continue with the procedure being performed, as seen below.



Alignment Procedure Bar

Whether ExpressAlign is enabled or disabled, a vertical procedure bar appears along the right side of the screen. The “Alignment Procedure” toolbar displays an icon for each alignment or WinAlign procedure available or performed.

The icons are arranged in order from the first step that you must complete to the last step that you must complete. After each alignment procedure has been completed, a checkmark will appear in the upper right corner of the corresponding icon.

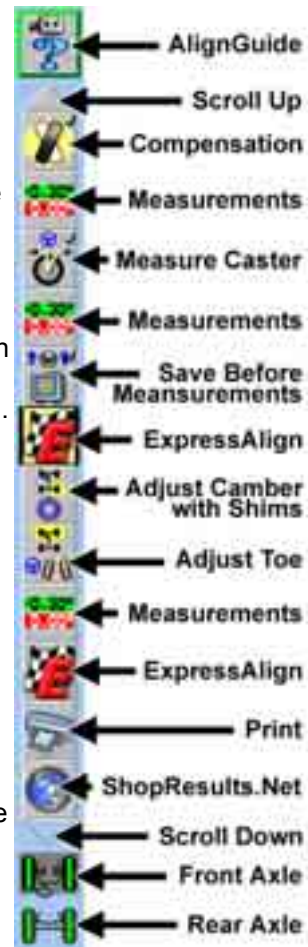
If there are more icons available than space on the screen, the toolbar can be scrolled up or down. If the triangular area at the top or bottom is gray there are more choices available and can be selected to scroll up or down. If the triangle is blue, no more choices are available in that direction.

When the cursor is placed over an icon, a message appears describing the icon’s function, such as “ExpressAlign.”

Selecting an icon from the “Alignment Procedure” bar will take you to the procedure that the icon represents.

Selecting  Backward key, or the  Forward key, will move the screen backward or forward in the alignment procedure as outlined on the procedure bar.

A Plan View Indicator, located along the right side of the screen, under the procedure bar, shows which axle is being adjusted when a gray background is present.



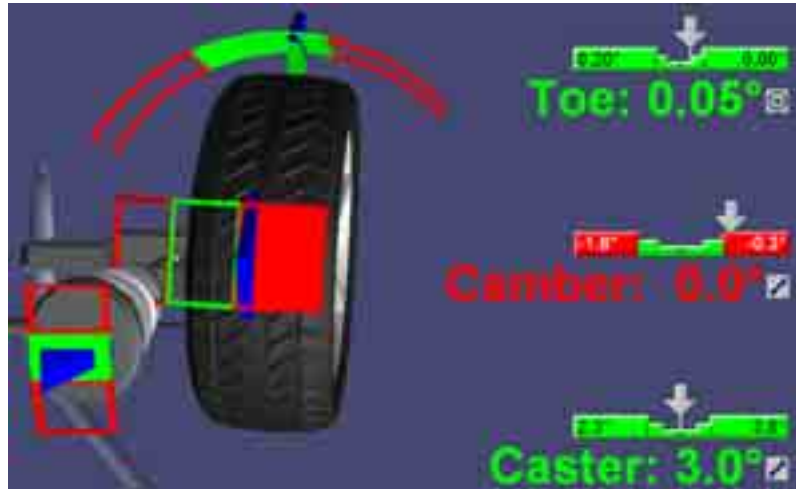
Using the Virtual View™ Adjustment Feature

NOTE: Virtual View is available only on 811 Aligners.

The Virtual View™ adjustment feature allows the user to view alignment angles in a 3-D perspective. This feature provides the user with a detailed view of the angles and their status in respect to alignment angle specifications and is reinforced with corresponding bar graphs.

Virtual View is available for most measurements and adjustments screens, plus Rolling Compensation, Caster Steer, and WinToe.

If the measured angles are within tolerance, the arrows will be in the green. If the measured angles are marginal, the arrows will be shown in yellow (*if half-tolerances are enabled*). If the measured angles are out of specification, the arrows will be shown in red areas. The arrowhead of the alignment angle will protrude through a 3-D specification bar graph showing the current angle status.



NOTE: If measurements have not been taken or are not available, the 3-D bar graph will not be shown in Virtual View.

From the “Vehicle Measurements and Adjustments” screen, you may toggle between Virtual View with bar graphs, or bar graph-only measurements by pressing “Show Bar Graphs” from the softkeys. Virtual View is the default “Vehicle Measurements and Adjustments” setting, however, may be disabled in “Aligner Setup.” Refer to Chapter 4, “Setup.”

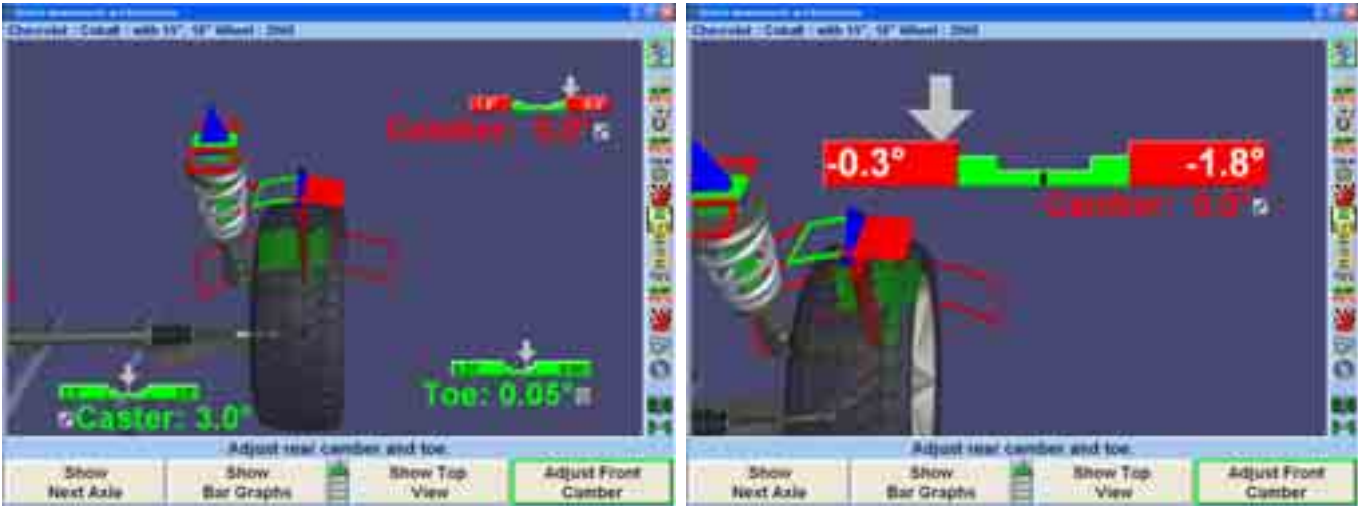
Virtual View displays all measured angles of the vehicle on one screen. It is not necessary to switch screens to view measurements on the front axle or the rear axle. Camber and toe for both axles, caster for the front axle, and thrust angle are all displayed adjacent to the appropriate wheel in Virtual View.

The Virtual View image has strategically placed hotspots for navigation around the vehicle on-screen. The image below exhibits some of the hotspots available. (Not all of these hotspots are available at once.)

Guide the mouse across the screen to highlight a hotspot, exhibited by a dotted line around the area. Boxes shown on the extreme out side edges of the screen will display a side-view of the vehicle when selected.



While in any Virtual View displaying bar graphs, click on an individual bar graph to zoom in to that particular view.



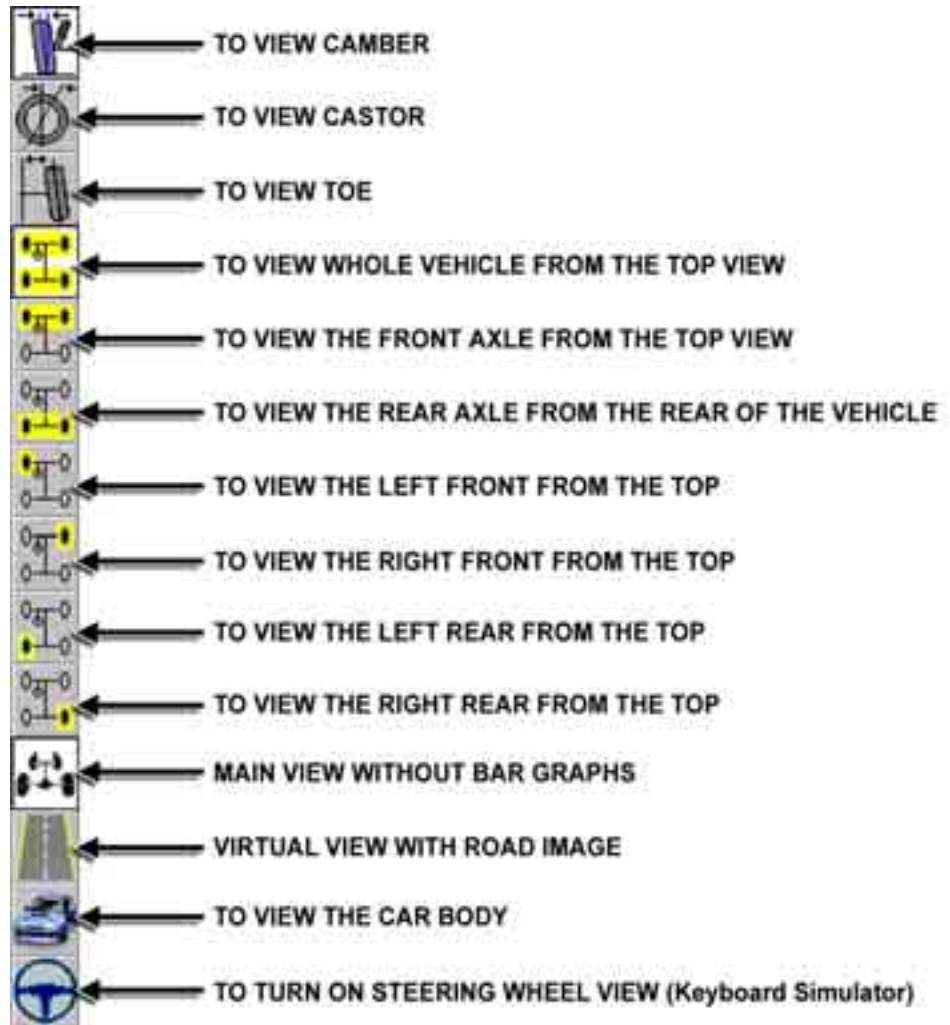
Right-click to return to the previous view.

Virtual View Angle Selector

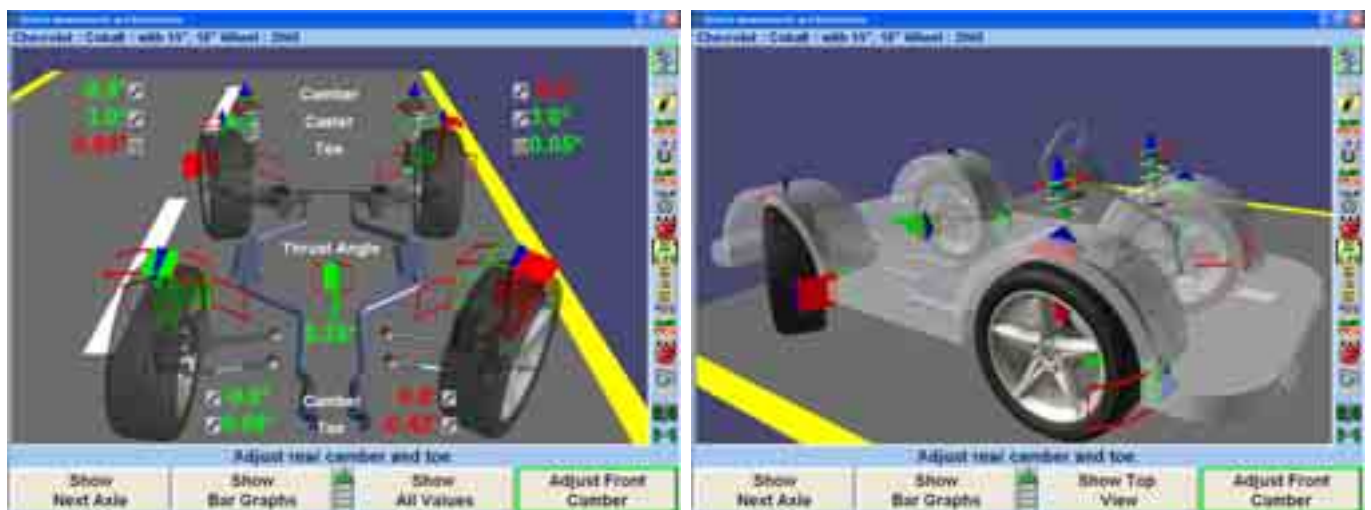
When Virtual View appears, the Virtual View Angle Selector on the left side of the screen will appear when the cursor is moved over the left side of the screen, allowing you to select a variety of wheel and angle views.



The icon highlighted in white represents the current Virtual View. Refer to the image below for a description of all the possible choices.




The Virtual View can be enhanced by adding the road image in relation to the vehicle and adding a view showing the car body.





The Dual Screen Virtual View requires Kit 20-1450-1.

SoundGuide™ Tone Feedback System

SoundGuide® tone feedback system is an audio recognition system that offers audible alignment feedback when performing certain functions within the alignment program.

SoundGuide , is available on many screens including the caster measurement screen and WinToe®, or from drop-down menus on most screens, as shown below.




Turn the SoundGuide “on” or “off” by single-clicking on the icon . When SoundGuide is off the icon appears with a red line through it . SoundGuide can be selected from bar graphs or icons next to individual angles to turn on SoundGuide for those individual adjustments.

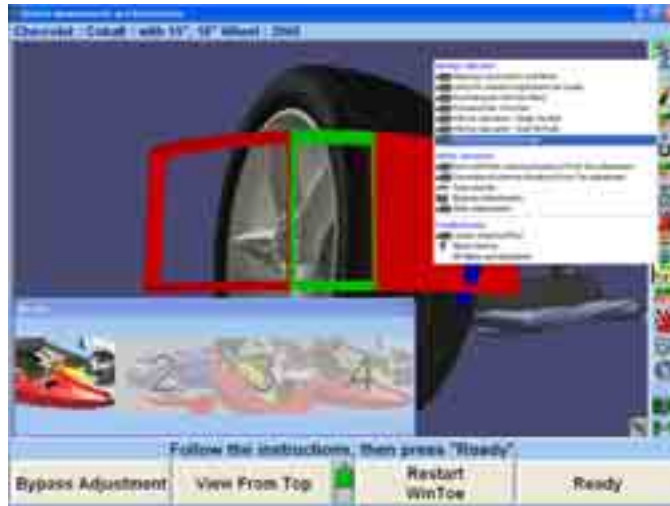
SoundGuide is available from various screens including: WinToe, Rolling Compensation, Caster Steer, Virtual View, and Bar Graphs.

AlignGuide™ Training and Information Guide

AlignGuide® training and information guide is an information center on WinAlign® software. It contains training videos and information on using WinAlign® software, wheel sensor operations, vehicle operations, vehicle troubleshooting, and alignment adjustment methods.


AlignGuide is available only with the Digital Video option.

To access the AlignGuide training feature, select the  icon above the Procedure Bar. A drop-down menu will list all the choices available including access to WinAlign® Help, *Tools and Kits*, *Illustrate Adjustments*, (these choices are context-sensitive based on the current WinAlign® screen), and a selection for *All Videos and Animations*.



Select the appropriate choice and the video, animation, illustration, or Help item will display.

Resetting the Program

The alignment program may be reset at anytime during an alignment by pressing the  key, located at the upper left-hand corner of the keyboard. A confirmation screen will appear to verify that the “Reset” button was pressed intentionally.



When this screen appears, press “YES” to reset the program or “NO” to continue working.



When the aligner is reset, the information collected for the alignment in progress will be erased and the display will return to the “Logo” screen.




Just-In-Time Training Video Instructions

Optional multimedia video instructions provide a live audio-visual demonstration of procedures. To view video instructions:

Press "Help," then press "Just-In-Time Training" to view a list of available videos.



Press  or  to highlight the desired video, and then press "Play Selection." The video will start.

Pressing  will pause the video, and  will restart the video after it has been paused. Pressing  will stop the video and return you to the Just-In-Time Training menu screen. After the video ends, you will be returned to the Just-In-Time Training menu screen.

Using the Screen Saver

If the CRT displays the same image for a long period of time, the image may become "burned in," and will be visible even when the display is turned off. This is a characteristic of ALL computer CRT displays.

When screen saver is on and any key (even a remote control key) is pressed, the program will reappear on the CRT. This single keystroke is recognized only by the screen saver program and will not affect the aligner program. After the screen is on, additional key presses will operate the program normally.

NOTE:	When screen saver is activated, the system is STILL RUNNING.
-------	--

1.5 Using the Remote Control

There are four remote controls available for use with the WinAlign® program, the Standard Remote, or three versions of the Remote Indicator.

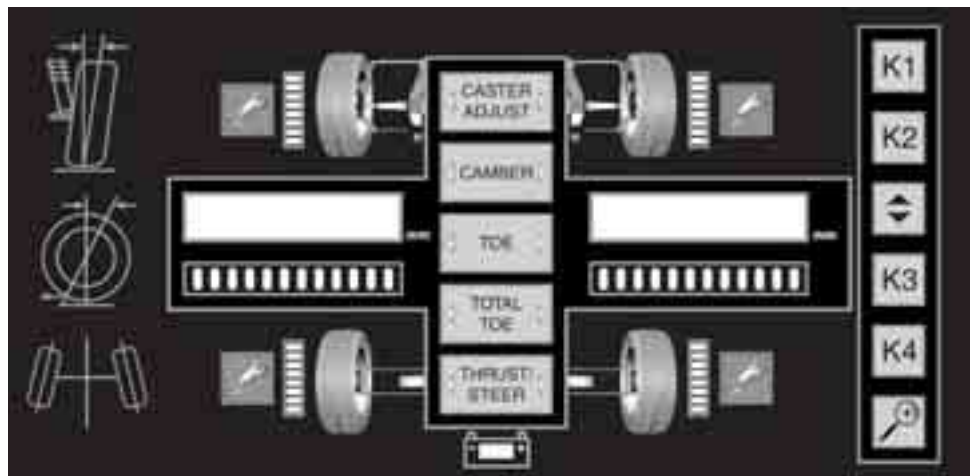
The standard remote control is included with the aligner console. The remote indicators are optional upgrades.

For detailed information on operation, care, and maintenance for the optional remote indicator refer to *Form 5382T, Operation Instructions for Remote Indicator, Models 30-418-1, 30-419-1, and 30-421-1.*

The Base model of the remote indicator displays alignment angles supplied by WinAlign® alignment software, version 1.5.1 and greater.

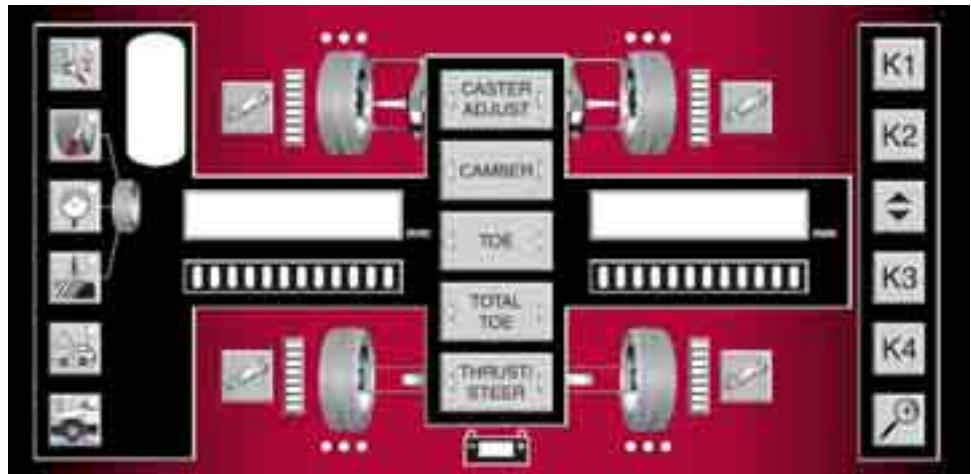
Base model, 30-419-1, is not capable of wireless communication.

Base model, 30-421-1, is capable of wireless communication.



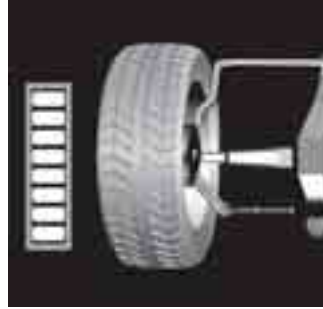
The Plus model of the remote indicator will display alignment angles supplied by WinAlign, (version 1.5.1 and greater) and also record measurements to be used by WinAlign (version 9.0 and greater).

Plus model, 30-418-1, is capable of wireless communication.



Sensor Compensation Display Using the Remote Control (Camera Sensors Only)

When using DSP400 or DSP600 Sensors, the four bar graphs of eight LEDs stacked in a row located next to each wheel graphic indicate the status of the targets during compensation.

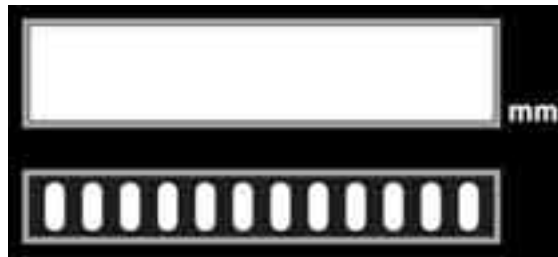


Turn the wheel (jacking compensation) or roll the vehicle (rolling compensation) to turn the LEDs from red to green.

Pause as WinAlign accepts the measurement, then turn wheel again as directed by indicator. When performing jacking compensation procedure, repeat the compensation procedure for all four wheels.

Measure Caster Display Using the Remote Control

When using conventional or camera sensors, the bar graphs located under the left and right value displays indicate the status of the front wheel orientation during the measurement of the caster.



Turn the steering wheel to turn the LEDs from red to green.

Pause as WinAlign accepts measurement, then again turn the steering wheel as directed by indicator.

Alignment Values Display Using the Remote Control

After the alignment measurements are complete, the remote indicator will display the alignment values.

Selection of Alignment Values to Display Using the Remote Control

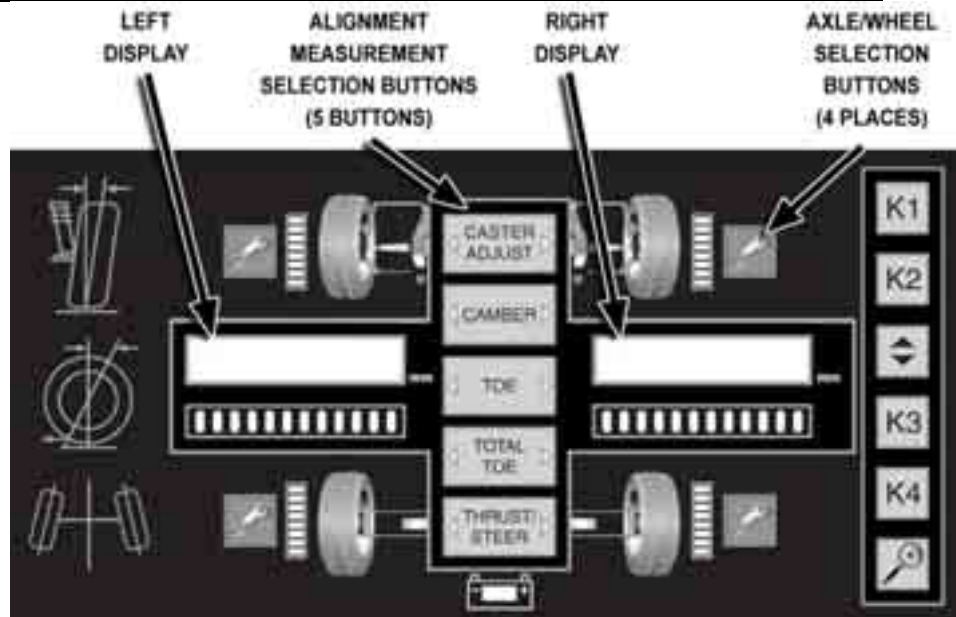
Press the selection button of the desired alignment measurement: caster adjust, camber, toe, total toe, or thrust (angle) / steer (ahead).

Using the left and right display, the remote indicator displays two alignment values.

The availability of different display combinations depends on the version of WinAlign within the aligner console. Pressing the selection button of the desired alignment measurement repeatedly will change the display combination, if more than one combination is available.

The available display combinations with WinAlign 9.0 are shown below.

Table 1: Available Display Combinations with WinAlign 9.0					
	CASTER ADJUST	CAMBER	TOE	TOTAL TOE	THRUST /STEER
CASTER ADJUST	YES	YES	X	X	X
CAMBER	YES	YES	YES	X	X
TOE	X	YES	YES	X	X
TOTAL TOE	X	X	X	X	YES
THRUST /STEER	X	X	X	YES	X



Press the wrench button next to the desired wheel or axle.

Alignment values will appear in the left and right displays.

Negative values are indicated with a negative sign “-” on left side of display.

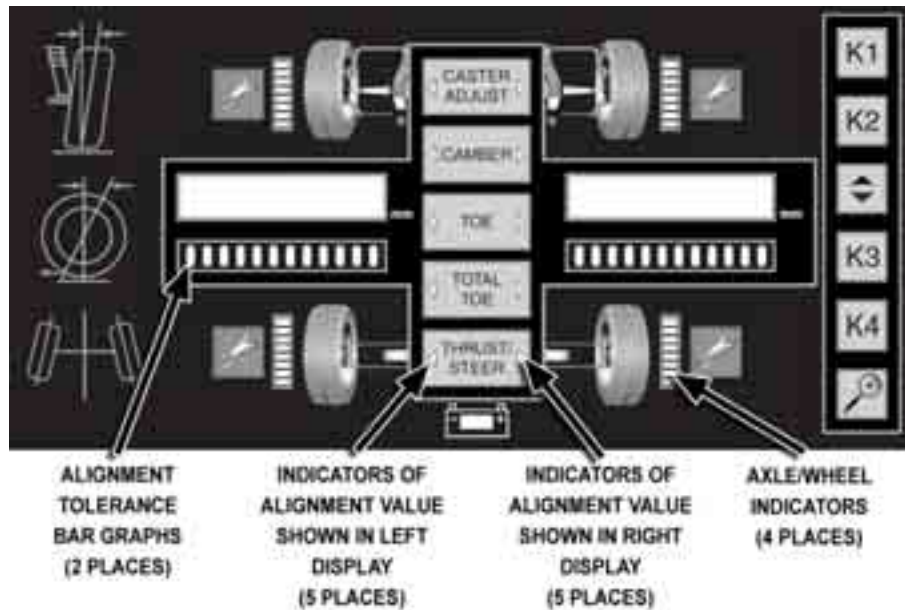
Degrees are indicated with a degree symbol “°” on right side of display.

Angles can also be displayed in degrees and minutes (ie 0°05' displayed for a measurement of zero degrees and 5 minutes).

Change the alignment measurement displayed by pressing another alignment measurement selection button.

Change the wheel or axle displayed by pressing another wrench button next to the desired vehicle location.

Identification of Values Displayed and Bar Graphs Using the Remote Control



LED indicators identify the type of alignment values displayed and the location of the measurements.

The illuminated green triangle to the right of the selection button indicates the type of alignment measurement shown in the right display.

The illuminated green triangle to the left of the selection button indicates the type of alignment measurement shown in the left display.

The partially illuminated bar graph next to one wheel or an axle indicates the location of the displayed alignment values.

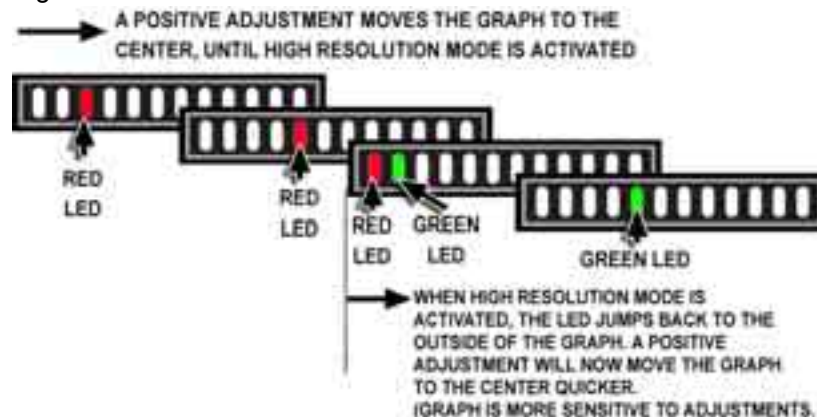
The “mm” illuminated indicates values displayed are in metric unit of millimeters.

LED Bar graphs below alignment value displays indicate the difference between the actual measurements of the vehicle and the recalled specifications.

A red LED indicates the alignment value is out of the specified range. If located on the left side of the bar graph, a positive alignment adjustment is needed. If located on the right side of the bar graph, a negative alignment adjustment is needed.

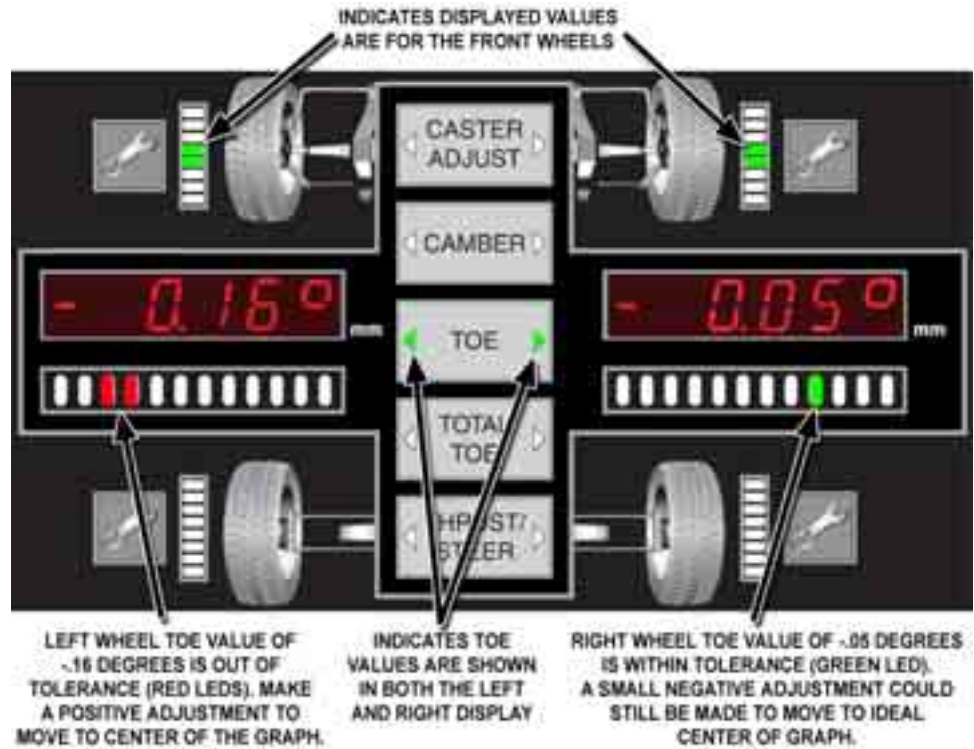
Green LEDs in the center of the bar graph indicates the alignment value is within the specified range.

With WinAlign 9.0 (or higher), the bar graph will enter a mode of higher resolution when the measured value is close to being within tolerance. The bar graph will just represent the near tolerance and within tolerance region.

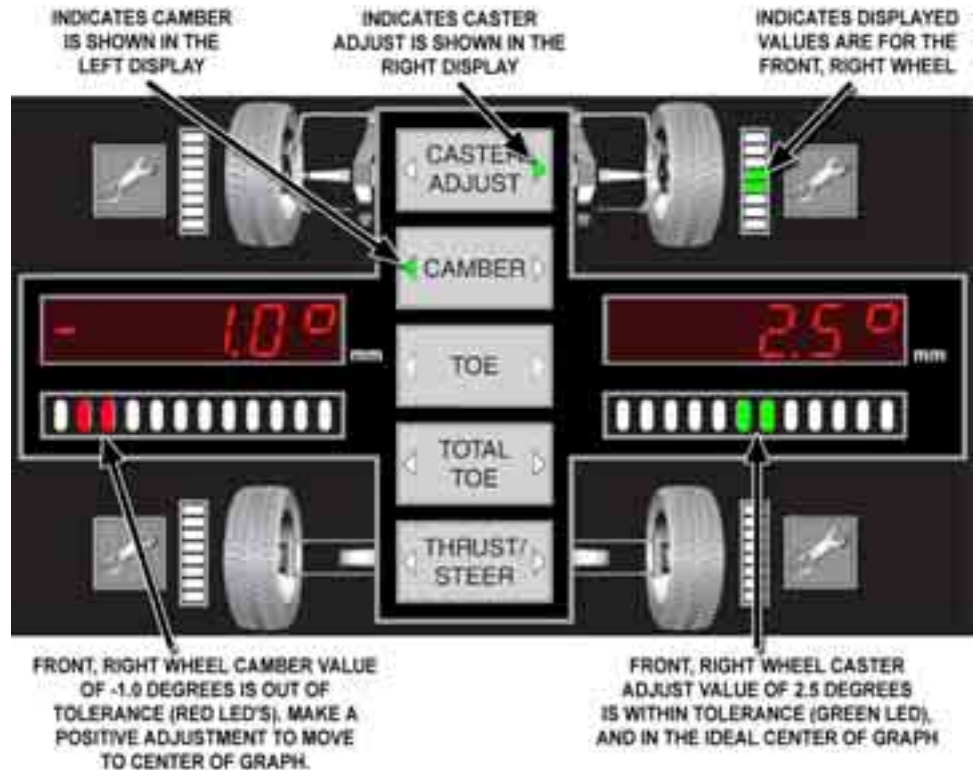


Examples of Alignment Displays Using the Remote Control

Individual Toe of Front Wheels: The display shows the left wheel toe is -0.16 degrees (out of tolerance) and the right wheel toe is -0.05 degrees (within tolerance).

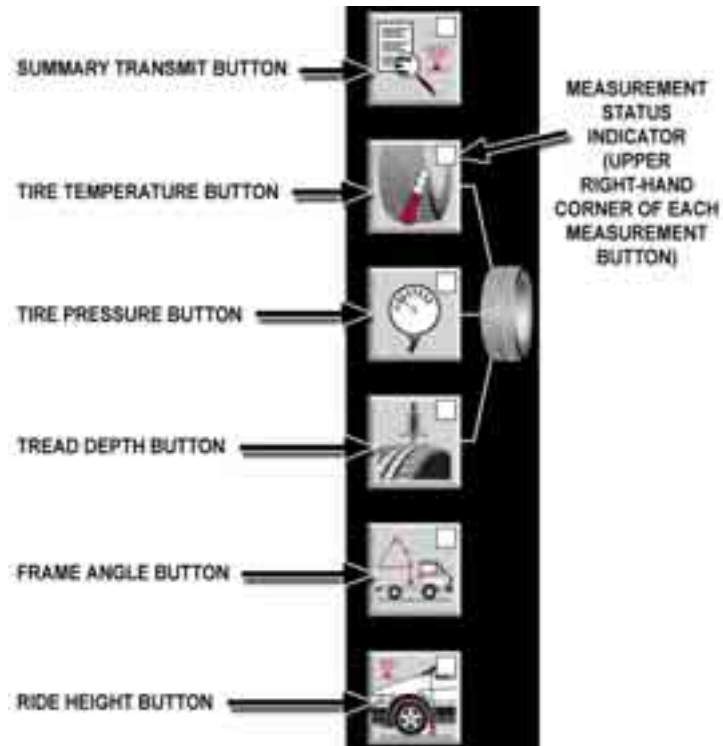


Camber and Caster Adjust of Right Front Wheel: The display shows the camber is -1.0 degrees (out of tolerance) and the caster adjust is 2.5 degrees (within tolerance) for the right front wheel.



Recording Measurements (Plus Model Only) Using the Remote Control

Select the desired measurement button to begin the process of entering measurement values.



The green LED in the corner of each button indicates the status of the remote.

After pressing a measurement button, the blinking green LED in the corner of the selected button indicates the remote is in the mode to store values for this measurement.

After exiting a measurement mode, the steady illumination of the green LED in the corner of the button indicates the remote has at least one stored value in remote's memory for this measurement.

An un-illuminated LED in the corner of the button indicates the remote has no stored values in remote's memory for this measurement.

Holding-down a measurement button for 3 seconds will erase the stored measurements.

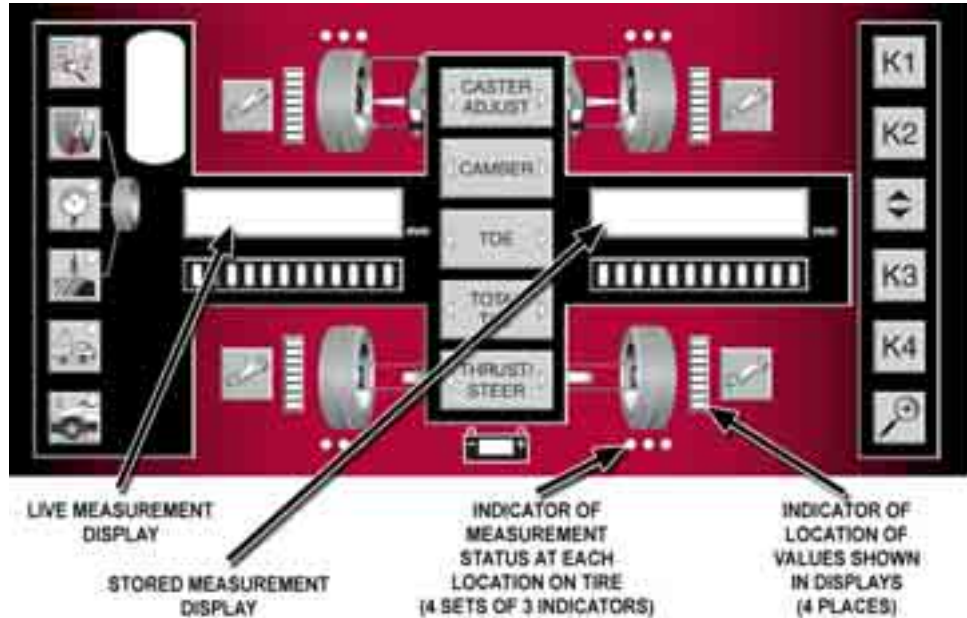
NOTE:	Holding-down the measurement button for 3 seconds to erase the stored measurements is true for all the measurement types, except ride height.
	Holding-down the summary button for 3 seconds will erase all the stored measurements for every measurement type.

Pressing any of the alignment angle buttons (caster adjust, camber, toe, total toe, or thrust / steer) will end a measurement mode and return the remote indicator to displaying alignment angles.

Display of Measurements Using the Remote Control - Value Displays

NOTE: The term “live” is used to indicate the value is active, in contrast to a stored value that is fixed.

The “live” measurement is shown in the display on the left side. Blinking LEDs in the bar graph below the display is to signify the value is “live.”



If present, the stored measurement is shown in the display on the right side. Steady LEDs in the bar graph below the display is to signify the value is the stored value.

Values may be further clarified by the following symbols:

Negative values are indicated with a negative sign “-” in the left side of the display.

Values displayed in inches are indicated with the double dash inch symbol in the right side of the display.

When angle is displayed, degrees are indicated with a degree symbol “°” in the right side of the display. Angles can also be displayed in degrees and minutes (ie 4°05’ for a measurement of four degrees and 5 minutes).

When a temperature is displayed, “C” is for Celsius and “F” is for Fahrenheit.

The “mm” illuminated indicates values displayed are in metric unit of millimeters.

Remote Control Indicators

NOTE: The state of the LED illumination, steady or blinking, is meaningful. Blinking LED's consistently indicates a live value. Steady LED's consistently indicates a stored value.

Along with LED in the corner of each measurement button to identify the active measurement mode, other LED indicators identify the location of the displayed measurement value and the presence of a stored value at each possible location.

The partially illuminated bar graph next to the wheel graphics indicates the location of the displayed values.

For tire temperature, pressure, and tread depth measurements, the tire location is indicated with the bar graph next a wheel.

For frame angle measurements, the side of the vehicle is indicated with bar graphs next to two wheels.

The green LED dots located above or below the wheel graphics further indicates the location of the displayed measurement and also the presence of stored values.

When a tire temperature or tread depth measurement is displayed, the location on the tire (outside edge, center or interior edge) is indicated by which of the three dots is flashing.

When a tire pressure measurement is the active mode, the three dots at each wheel graphic act as one indicator, since each tire only has one pressure measurement.

When a frame angle measurement is the active mode, the six dots at each side of the vehicle graphic act as one indicator, since each side only has one angle measurement.

The presence of stored values at the individual locations is indicated by steady illumination of the green dot or dots (depending on measurement).

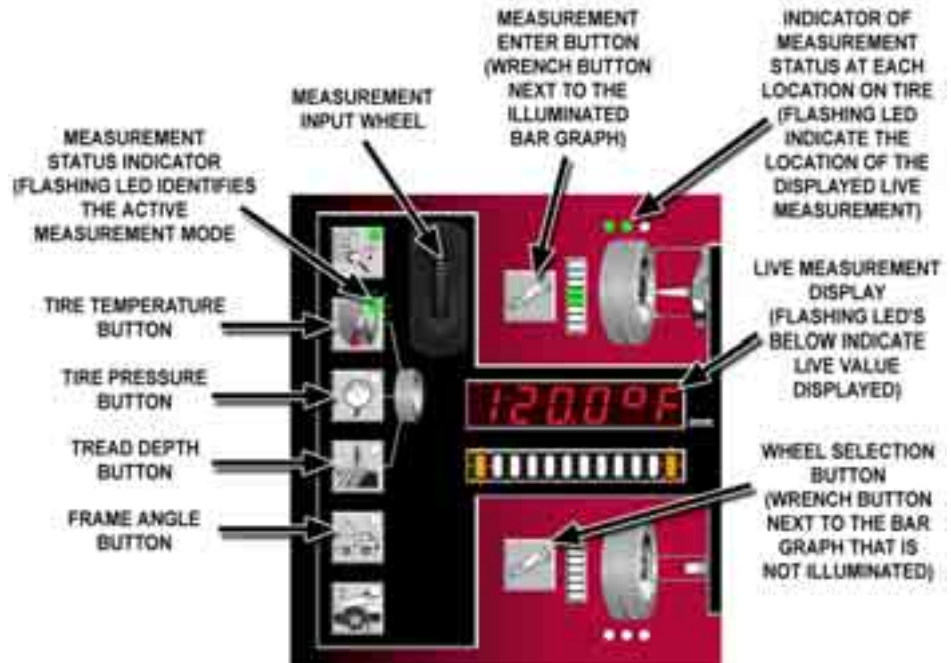
Un-illuminate green dot (or dots) indicates that a value is not stored at these locations.

NOTE: **When the ride height measurement mode** is selected, only the LED in the corner of the ride height button is flashing to identify the active measurement mode. No other LED indicators are used to identify location or presence of stored values, because the remote indicator does not store ride height values. REFER to 3.6 for ride height operation instructions.

Storing Measurement Values Using the Remote Control

NOTE: The remote indicator does not store ride height values. REFER to 3.6 for ride height operation instructions.

Storing measurement values is done using buttons, the dial and indicators on the remote indicator in a consistent manor for each type of measurement.



Select the desired measurement button. The blinking LED in the corner identifies the active measurement mode. (When not active, a solid green LED indicates the presence of a stored value for the measurement type.)

The flashing green LED dot (or dots) located above and below the wheel graphics indicate the location of the displayed measurement. (A solid green LED dot indicates the presence of a stored value for the location.)

Set the “live” measurement in the display on the left side by dialing in the desired value with the measurement input wheel (or by using the output of a built-in sensor).

NOTE: When in a measurement mode, the function of the wrench button depends on the illumination of the bar graph next to it.

Press the wrench button next to the illuminated bar graph to store the value.

Press the wrench button next to a bar graph that is not illuminated to select another tire or vehicle side.

Refer to the particular instructions for each measurement type.

Tire Temperature Readings Using the Remote Control



Select the tire temperature button.

Identify the location for displayed “live” measurement as indicated by the LED indicators. Each single green LED dot located above and below the wheel graphics represents a location on the tire: outboard, center and inboard.

NOTE: The remote indicator will automatically detect the thermocouple probe. The temperature reading will automatically be displayed as the “live” measurement.

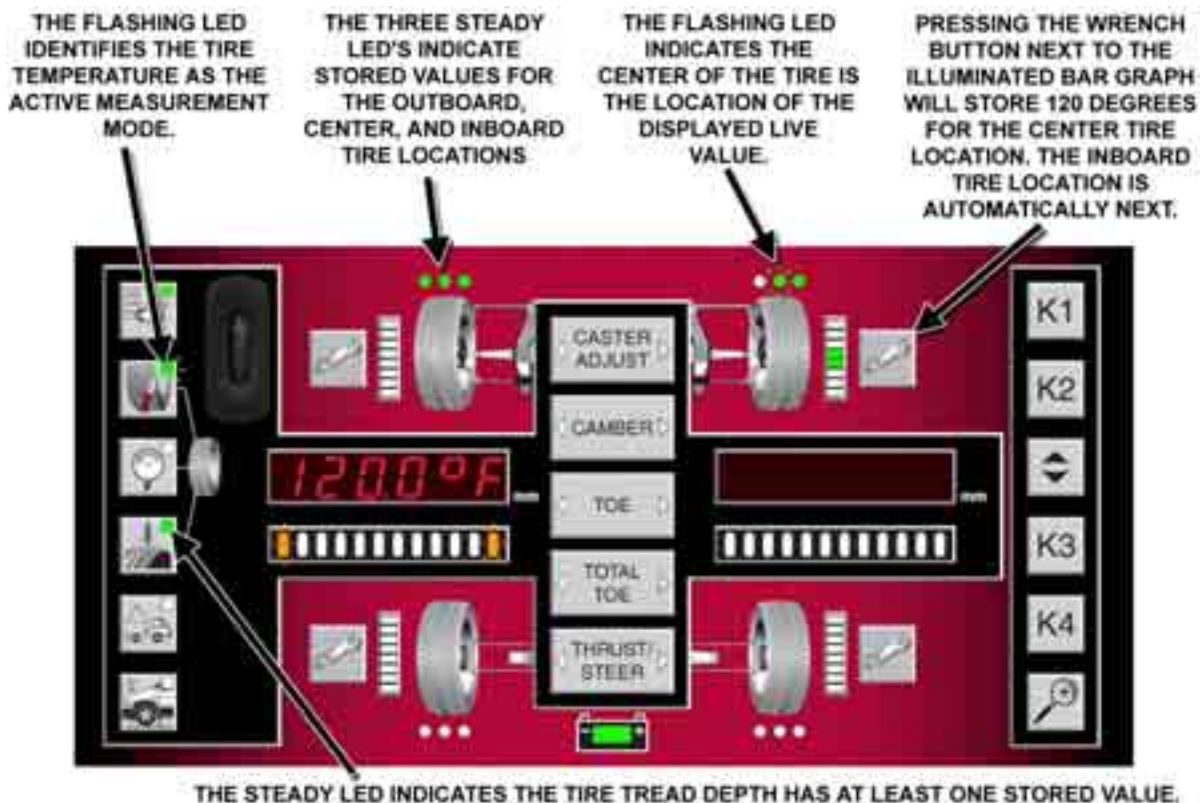
Use either the remote’s thermocouple to measure the temperature or use another temperature gage to measure and then dial-in the value with the input wheel.

With the “live” measurement on the left side displaying the desired value, press the wrench button next to the illuminated bar graph to store the value.

The remote indicator will automatically advance to the next measurement location on the tire. Repeat the measurement entering process until the outboard, center and inboard tire location have a stored value.

When storage of measurement values for the outboard, center and inboard tire location is complete for a tire, move to another tire by pressing a wrench button next to a bar graph that is not illuminated.

Repeat the measurement entering process until a value is stored for every location as indicated by the illuminated LED dots.



Tire Pressure Readings Using the Remote Control



Select the tire pressure button.

Identify the location for displayed “live” measurement as indicated by the LEDs on the remote indicator. Each set of three green LED dots located above and below the wheel graphics represents a tire location.

Use a pressure gage to measure and then dial-in the value with the input wheel.

With the “live” measurement on the left side displaying the desired value, press the wrench button next to the illuminated bar graph to store the value.

Move to another tire by pressing the tire pressure button to advance to the next location or by pressing wrench button next to bar graph that is not illuminated.

Repeat the measurement entering process until a value is stored for every location as indicated by the illuminated LED dots.

Tire Tread Depth Using the Remote Control



Select the tire tread depth button.

Identify the location for displayed “live” measurement as indicated by the LED indicators on the remote. Each single green LED dot located above and below the wheel graphics represents a tire location: outboard, center and inboard.

Use a tread depth gage to measure the tread depth at the indicated location and then dial-in the value with the input wheel.

With the “live” measurement on the left side displaying the desired value, press the wrench button next to the illuminated bar graph to store the value.

The remote will automatically advance to the next measurement location on the tire. Repeat the measurement entering process until the outboard, center and inboard tire location have a stored value.

When storage of measurement values for the outboard, center and inboard tire location is complete for a tire, move to another tire by pressing a wrench button next to a bar graph that is not illuminated.

Repeat the measurement entering process until a value is stored for every location as indicated by the illuminated LED dots.

Frame Angle Using the Remote Control



Select the frame angle button.

Identify the location for displayed “live” measurement as indicated by the LED indicators on the remote. The set of six green LED dots located above and below the wheel graphics represents the side of the vehicle.

Position the remote on the vehicle to measure the angle. The built-in angle sensor will measure and display the frame angle.

With the “live” measurement on the left side displaying the desired value, press either wrench button next to the illuminated bar graphs to store the value.

Move to the other side by pressing the frame angle button or by pressing a wrench button next to bar graph that is not illuminated.

Repeat the measurement entering process.

Reviewing and Editing Stored Values Using the Remote Control

Select the desired measurement button with stored values (as identified with the solid green LED indicating the presence of a stored value for the measurement type.)

The stored value (if present) in the first location is shown in right display. The measurement location is indicated by the flashing green LED dot or dots (located either above or below the wheel graphics).

Pressing the measurement button again will advance the display to the stored value in the next location.

Another way to change the measurement location is by pressing the wrench button next to an un-illuminated bar graph. Measurement location will change to this wheel or side. For tire temperature or tread depth measurements, the location on the tire (outside edge, center or interior edge) is changed by pressing the measurement button.

To replace the stored value, set the “live” measurement on the left side displaying the desired value (by dialing in the desired value or by using the output of a built-in sensor), and then press the wrench button next to the illuminated bar graph to store the new value.

Remote Control Summary / Transmit Button

NOTE: WinAlign 9.0 (or higher) is required for the aligner console to receive tire and frame angle measurements.



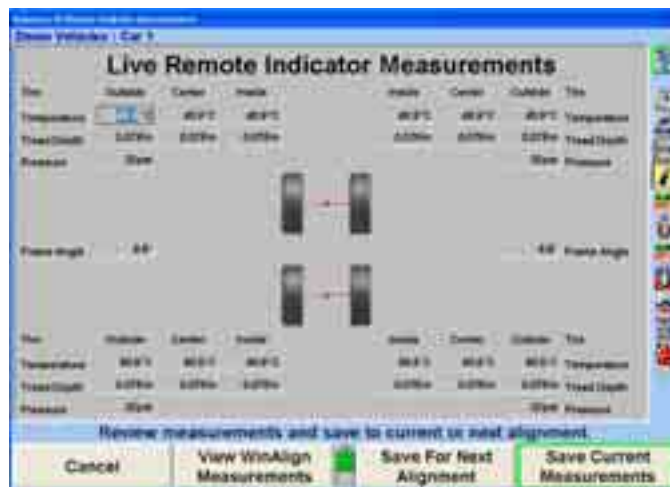
Steady LED in the corner of the summary button identifies the presence of a stored value for any of the measurement types.

NOTE: Pressing and holding the summary button for 3 seconds erases ALL the stored measurement values in the remote.

Press the summary button once to transmit the stored values to WinAlign.

The blinking LED in the corner of the summary button indicates the values are being transmitted.

WinAlign will display a summary of the measurements. Blank fields within the summary indicate that no value was transmitted for this measurement.



NOTE: Refer *WinAlign Operation Manual Version 9.0, 3850T*, for additional information regarding WinAlign screens.

The WinAlign summary popup will show the following values:

- Front Axle - 6 values of tire temperature
- Rear Axle – 6 values of tire temperature
- Front Axle - 2 values of tire pressure
- Rear Axle – 2 values of tire pressure
- Front Axle - 6 values of tire tread depth
- Rear Axle – 6 values of tire tread depth
- 2 values of frame angle

After the values are successfully transmitted to WinAlign, all the stored measurement values are erased from the remote.

Ride Height Using the Remote Control

NOTE: Recalling certain vehicles from the information database, will automatically bring up the “Ride Height” screen, such as Volkswagen Touareg.

Refer WinAlign Operation Manual Version 9.0, 3850T, for additional information regarding WinAlign screens.

From the alignment measurements display screen, press the menu shift key, until the “Make Additional Measurements” softkey is displayed. Press the “Make Additional Measurements” softkey. Highlight “Ride Height” from the list using the arrow softkeys or mouse. Press “OK” softkey.

When prompted by the WinAlign program, begin ride height measurement procedure with the wheel indicated.

Reference the WinAlign image of the vehicle to determine the appropriate reference points for the ride height measurements.

Press the ride height button on the remote.



The blinking LED in the corner identifies ride height as the active measurement mode.

NOTE: No other LED indicators are used to identify location or presence of stored values, since the remote indicator only transmits the live ride height value.

Use a gage to measure the ride height and then dial-in the value with the input wheel located at the upper, left corner.

NOTE: WinAlign 9.0 (or greater) is required for the aligner console to receive ride height measurements from the remote indicator.

With the blinking LED identifying ride height as the active measurement mode, press the ride height button again to transmit the value to WinAlign.

The distance measured will be displayed within the appropriate field on the WinAlign screen. The cursor will then move to the next ride height entry field.

Repeat the process to enter all ride height measurements, as prompted by WinAlign.

Using the Standard Remote Control

The standard aligner console remote control provides operation of the WinAlign® program from a distance by duplicating the five softkeys. Some remote controls have six softkeys **K1**, **K2**, **K3**, **K4**, **K5**, and a zoom key **+**. Pressing **+** will zoom screens that support the zoom feature.

To use the remote control, point the front end of the transmitter toward the front of the aligner and press the appropriate softkey.

NOTE: The remote control transmitter is a “line-of-sight” device and will not transmit signals through solid objects.

1.6 An Example Alignment Job with the ExpressAlign Adjustment Feature and DSP400/DSP600 Sensors

Following are two examples of alignments performed with DSP400 or DSP600 targets using ExpressAlign®. Each example utilizes different options enabled within the WinAlign® program.

Example 1 (ExpressAlign® / DSP400/DSP600)

This example alignment job assumes that the system is configured as follows:

ENABLED
ExpressAlign Level III

Your system may be configured differently.

NOTE: This section is an overview of an alignment job using the ExpressAlign® feature. For details about any procedure, refer to the appropriate section of the manual or press "HELP" in the WinAlign® program.

From aligner setup, "DSP400 Sensors or DSP600 Sensors" must be selected as the default sensor. Refer to "Aligner Setup".

Prepare the vehicle for alignment as follows:

Drive the vehicle onto the alignment rack, centering the front wheels on the turnplates.

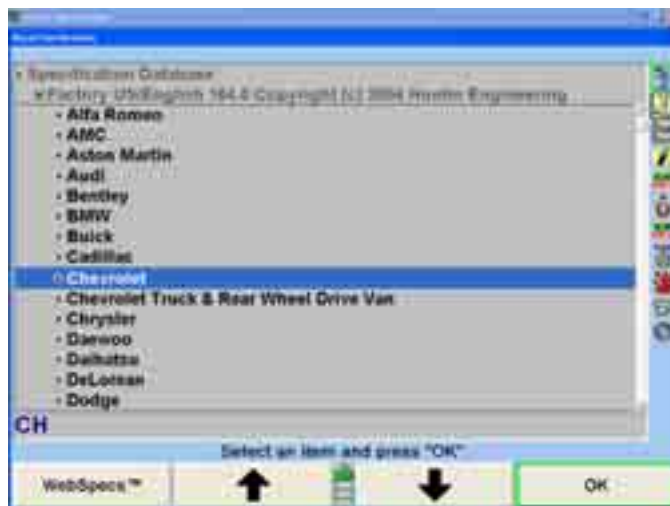
Apply the vehicle parking brake and place the transmission in park, if applicable. On standard transmission vehicles, the transmission should be placed in neutral.



Position chocks at the front and rear of the left rear tire to keep the vehicle from rolling.

Place the lift at alignment height.

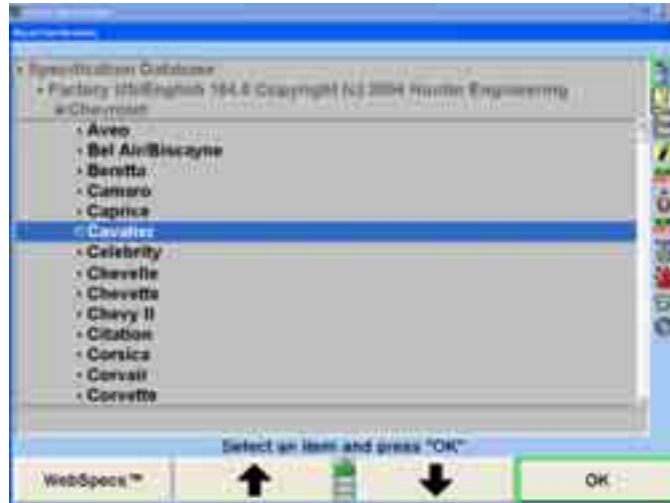
Check and adjust tire pressure to vehicle manufacturer's specification. Inspect for unevenly worn or mismatched tires.



Start the alignment program by pressing "Begin Alignment" on the "Logo" screen. The "Recall Specifications" popup screen will appear.



Press  or  to highlight the manufacturer of the vehicle being aligned.

Press “OK” to select the highlighted manufacturer. The next screen will list the models available from the selected manufacturer.



Press  or  to highlight the model of the vehicle being aligned.

Press “OK” to select that model.

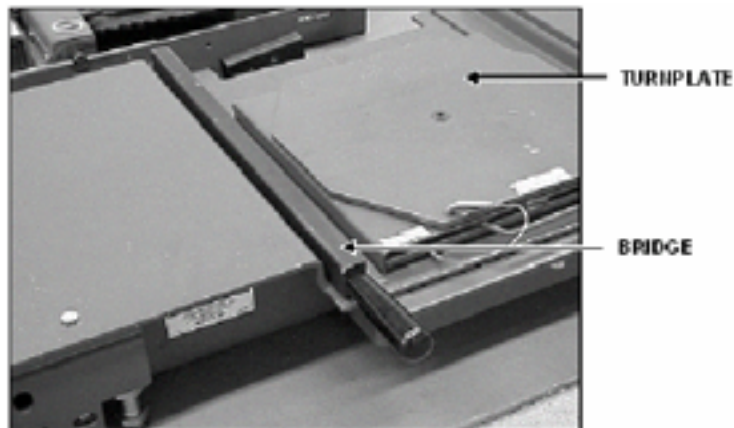
Continue in this manner until the vehicle is identified to the program.

The screen will change to the “Compensation Control” popup screen.

There are two methods of compensation, rolling and jacking. The method chosen for this example procedure is rolling compensation. Refer to “Rolling Compensation,” page 50, or to “Jacking Compensation,” page 59.

Verify that the pins are in the turnplates and slip plates.

Position a turnplate bridge in each pocket behind the turnplate so the runway surface and the bar surface are flush. Rotate the bridges so they are taller than wide.



Place wheel chocks that limit rearward motion approximately 15 inches behind the rear wheel(s).

Steer ahead with transmission in neutral and the parking brake off.

Mount the targets and wheel adaptors on the wheels. Refer to “Mounting Sensors or Targets onto Wheel Adaptors,” page 45.

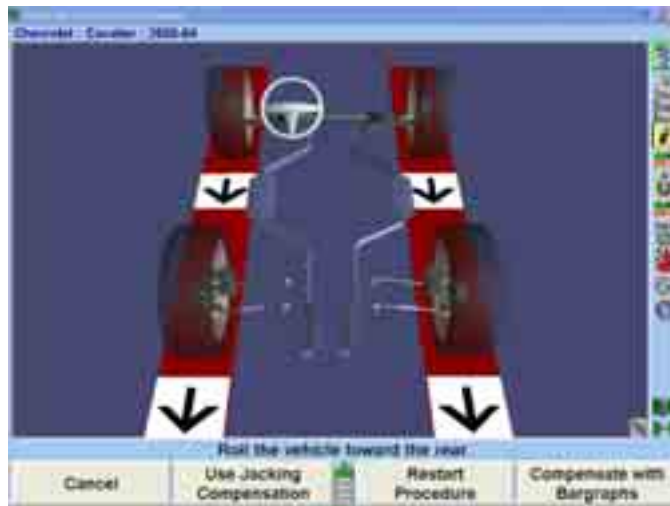
Level and lock the targets.

NOTE: The targets should not be re-leveled at any time during the alignment. The only exception being - If the target is removed from the wheel adaptor during the alignment, (shim replacement, steering component replacement, etc.) the affected target must be re-leveled and re-compensated, using jacking compensation.

NOTE: Beginning the rolling compensation procedure removes any previous compensation from the targets.

The screen instructs you to roll the vehicle rearward. Release parking brake and put transmission in neutral. Roll the vehicle rearward until the arrows turn green.

NOTE: It is recommended to roll the vehicle by rotating the left rear tire. Do not push or pull the vehicle by the front (steering axle) tires or wheels during rolling compensation. Do not push or pull on spoilers, fascia moldings, or other "trim" accessories.



NOTE: A vehicle with 28-inch diameter tires will require approximately 12 – 14 inches of movement. Smaller diameter tires will require less movement, while larger diameter tires will require more.

Stop rearward movement of the vehicle. The arrows will disappear for a moment.

If a new style remote indicator is used, indicators for all four wheels will be flashing, indicating to roll forward.

When the compensation arrows reappear, roll the vehicle forward to the original position.

When all four targets have been compensated, apply the vehicle parking brake and place the transmission in park, if applicable. On standard transmission vehicles, the transmission should be placed in neutral.

Position chocks at the front and rear of the left rear tire to keep the vehicle from rolling.

NOTE: The rolling compensation procedure **MUST** end with the vehicle in the proper position to check and adjust the alignment.

After the targets have been compensated, remove the pins from the turnplates and slip plates.

Turn the turnplate bridges into the stored position.

The screen will change to the “Caster and S.A.I. Measurement” popup screen that will direct you to measure caster.



Install the brake pedal depressor. Steer the wheels as directed and follow the on-screen directions.

NOTE: Do **NOT** block the front targets during the “Measure Caster” Procedure. One of the two rear targets may be blocked during the “Measure Caster” procedure.

After caster has been measured, the screen prompts you to steer the wheels straight ahead.

The measurements of the vehicle will be saved.

The screen will change to Virtual View with the “ExpressAlign®” menu.



NOTE: The actual procedures displayed will vary depending on the vehicle and alignment angles that need to be adjusted.

An icon will be displayed in the “ExpressAlign®” popup screen for each suggested procedure. Selecting the corresponding icon in the procedure bar will start the procedure that the icon represents.

Procedures that have yellow text in the “ExpressAlign®” popup screen refer to adjustments that must be made for the specified vehicle.

Selecting the ExpressAlign® icon in the procedure bar will prompt you through the recommended sequence for the alignment. In this instance, rear camber and toe will be the first necessary adjustment.



Remove the wheel to install shim. After installing shim and reinstalling wheel with target and wheel adaptor, the target must be re-compensated using jacking compensation.



Press “Cancel” if no adjustments were made.

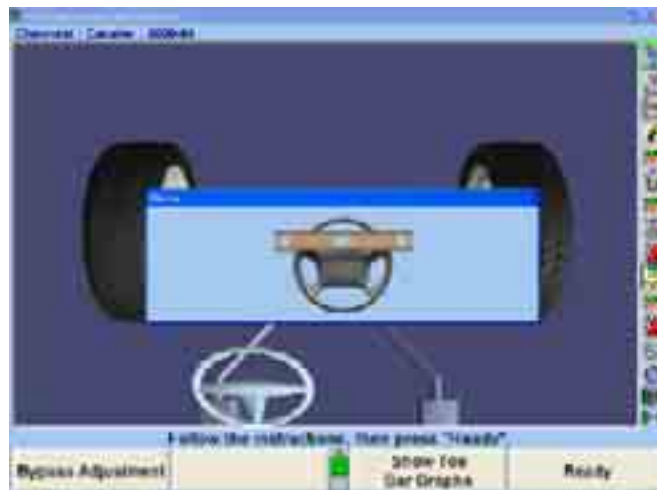
OR

Press “OK” to re-compensate the target.

Follow the on-screen directions to compensate the target. Press “Continue” when finished.



Follow the on-screen directions, then press “Ready.”



Adjust the right tie rod, follow the on-screen directions, then press “Ready.”



Adjust the left tie rod, follow the on-screen directions, then press “Ready.”

Steer ahead to center the bar graph. The steering wheel should be level. Press “Ready.” If the steering wheel is not level, restart WINTOE® and correct as necessary.



Press the “Check With ExpressAlign®” softkey.



After all adjustments are completed, select the “Print” softkey or select “Print Summary” from the ExpressAlign menu to print the alignment results.



Press “Print Summary.” Before printing, the “Print” popup screen will allow the technician to input the current steering wheel status and make additional notes as needed. After steering ahead, add the necessary comments for the printout and select “Print Summary.”



After printing the results, the “Vehicle Measurements and Adjustments” primary screen will appear with the current vehicle measurements showing. The alignment is complete.



Verify that the pins are in place in the slip plates and turnplates before driving the vehicle off the rack.

Example 2 (ExpressAlign® / DSP400/DSP600)

This example alignment job assumes that the system is configured as follows:

ENABLED
Display of Vehicle Specifications
Show Measurements Display After Compensation
Show Measurements Display After Caster
Verify Caster Adjustment
DSP400/DSP600 Instructions
ExpressAlign Level III

Your system may be configured differently.

NOTE: This section is an overview of an alignment job using the ExpressAlign® feature. For details about any procedure, refer to the appropriate section of the manual or press “HELP” in the WinAlign® program.

From aligner setup, “DSP400 Sensors or DSP600 Sensors” must be selected as the default sensor. Refer to “Aligner Setup,” page 173.

Prepare the vehicle for alignment as follows:

Drive the vehicle onto the alignment rack, centering the front wheels on the turnplates.

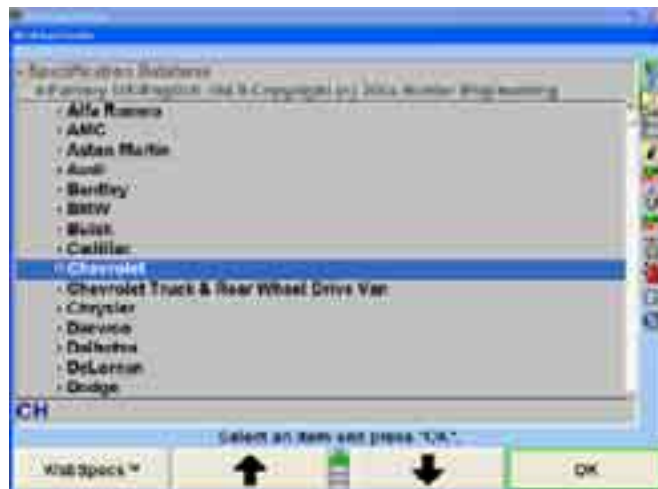
Apply the vehicle parking brake and place the transmission in park, if applicable. On standard transmission vehicles, the transmission should be placed in neutral.



Position chocks at the front and rear of the left rear tire to keep the vehicle from rolling.

Place the lift at alignment height.

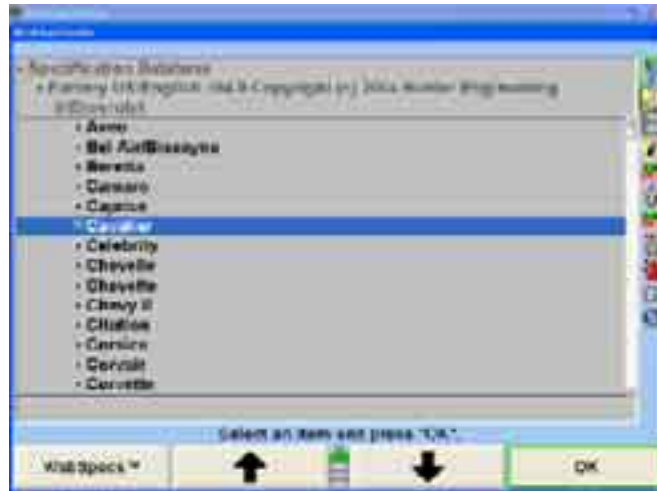
Check and adjust tire pressure to vehicle manufacturer’s specification. Inspect for unevenly worn or mismatched tires.



Start the alignment program by pressing “Begin Alignment” on the “Logo” screen. The “Recall Specifications” popup screen will appear.



Press  or  to highlight the manufacturer of the vehicle being aligned.

Press “OK” to select the highlighted manufacturer. The next screen will list the models available from the selected manufacturer.



Press  or  to highlight the model of the vehicle being aligned.

Press “OK” to select that model.

Continue in this manner until the vehicle is identified to the program. The “Vehicle Specifications” primary screen displays the identification and alignment specifications for the vehicle chosen.

Confirm that the vehicle identified is the vehicle you have chosen and then press the “Mount Sensors and Compensate” icon in the procedure bar.



The screen will change to the “Compensation Control” popup screen.



There are two methods of compensation, rolling and jacking. The method chosen for this example procedure is jacking compensation. Refer to "Rolling Compensation," page 50, or to "Jacking Compensation," page 59.

Verify that the pins are in the turnplates and slip plates.

Position a turnplate bridge in each pocket behind the turnplate so the runway surface and the bar surface are flush. Rotate the bridges so they are taller than wide.



Place wheel chocks that limit rearward motion approximately 15 inches behind the rear wheel(s).

Steer ahead and lock the steering wheel.

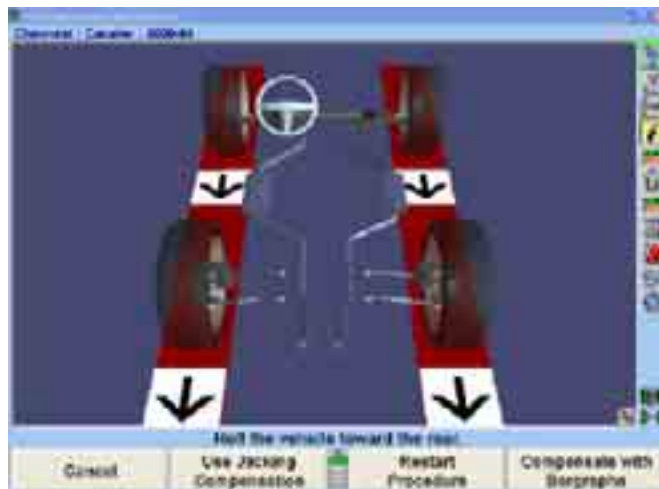
Mount the targets and wheel adaptors on the wheels. Refer to "Mounting Sensors or Targets onto Wheel Adaptors," page 45.

Level and lock the targets, then press "Ready."

NOTE: The targets should not be re-leveled at any time during the alignment. The only exception being - If the target is removed from the wheel adaptor during the alignment, (shim replacement, steering component replacement, etc.) the affected target must be re-leveled and re-compensated, using jacking compensation.

NOTE: Beginning the rolling compensation procedure removes any previous compensation from the targets.

The screen instructs you to roll the vehicle rearward. Release parking brake and put transmission in neutral. Roll the vehicle rearward until the arrows turn green.



NOTE: It is recommended to roll the vehicle by rotating the left rear tire. Do not push or pull the vehicle by the front (steering axle) tires or wheels during rolling compensation. Do not push or pull on spoilers, fascia moldings, or other “trim” accessories.

NOTE: A vehicle with 28 inch diameter tires will require approximately 12 – 14 inches of movement. Smaller diameter tires will require less movement, while larger diameter tires will require more.

Stop rearward movement of the vehicle. The arrows will disappear for a moment.

If a new style remote indicator is used, indicators for all four wheels will be flashing, indicating to roll forward.

When the compensation arrows reappear, roll the vehicle forward to the original position.

When all four targets have been compensated, apply the vehicle parking brake and place the transmission in park, if applicable. On standard transmission vehicles, the transmission should be placed in neutral.

Position chocks at the front and rear of the left rear tire to keep the vehicle from rolling.

After the targets have been compensated, the “Compensation Control” popup screen will give further instructions on how to perform the alignment procedure.



Remove the pins from the turnplates and slip plates.

Turn the turnplate bridges to the stored position.

Press “Ready.”

The screen will change to the “Vehicle Measurements and Adjustments” primary screen. Alignment measurements for the current vehicle are shown on this screen.



Press the “Measure Caster” icon in the procedure bar. The screen will change to the “Caster and S.A.I. Measurement” popup screen that will direct you to measure caster.

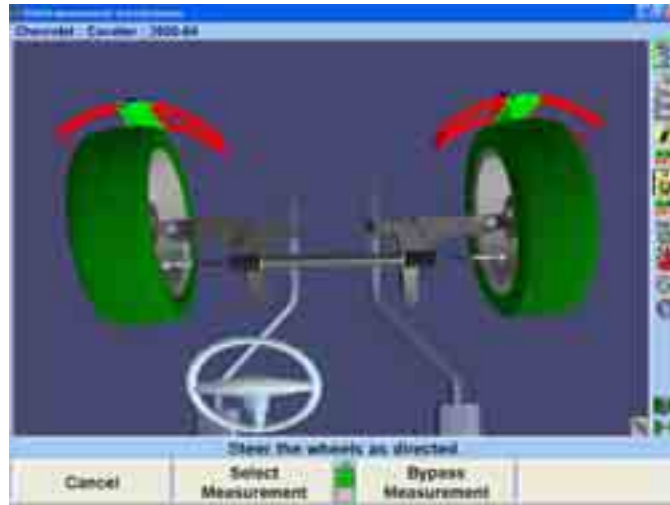


Install the brake pedal depressor.

NOTE: Do **NOT** block the front targets during the “Measure Caster” Procedure. One of the two rear targets may be blocked during the “Measure Caster” procedure.

Steer the wheels as directed and follow the on-screen directions.

After caster has been measured, the screen prompts you to steer the wheels straight ahead.



The “Vehicle Measurements and Adjustments” primary screen will appear.



These are the initial measurements of the vehicle. Press the “Save ‘Before’ Measurements” icon in the procedure bar to save them for the printout.

The measurements of the vehicle will be saved.

The screen will change to the “ExpressAlign®” menu screen.



NOTE: The actual procedures displayed will vary depending on the vehicle and alignment angles that need to be adjusted.

Each suggested procedure will be displayed in the “ExpressAlign®” menu. Selecting the corresponding icon in the procedure bar or the text in the menu will start the procedure that the icon represents.

Selecting the “ExpressAlign®” icon in the procedure bar will prompt you through the recommended sequence for the alignment. In this instance, the left rear camber and toe will be the first necessary adjustment.

This vehicle uses shims to adjust rear camber and toe. Selecting the “Adjust Camber & Toe” icon in the procedure bar will automatically proceed to Shim Select® II and display the correct shim for the necessary adjustment.



If the vehicle you are aligning does not use shims, ExpressAlign® will select and display the appropriate adjustment screen.

Remove the wheel to install shim. After installing shim and reinstalling wheel with target and wheel adaptor, the target must be re-compensated using jacking compensation.



Press “Cancel” if no adjustments were made.

OR

Press “OK” to re-compensate the target.

Follow the on-screen instructions, then press “Ready.”



Follow the on-screen instructions, then press “Continue.”

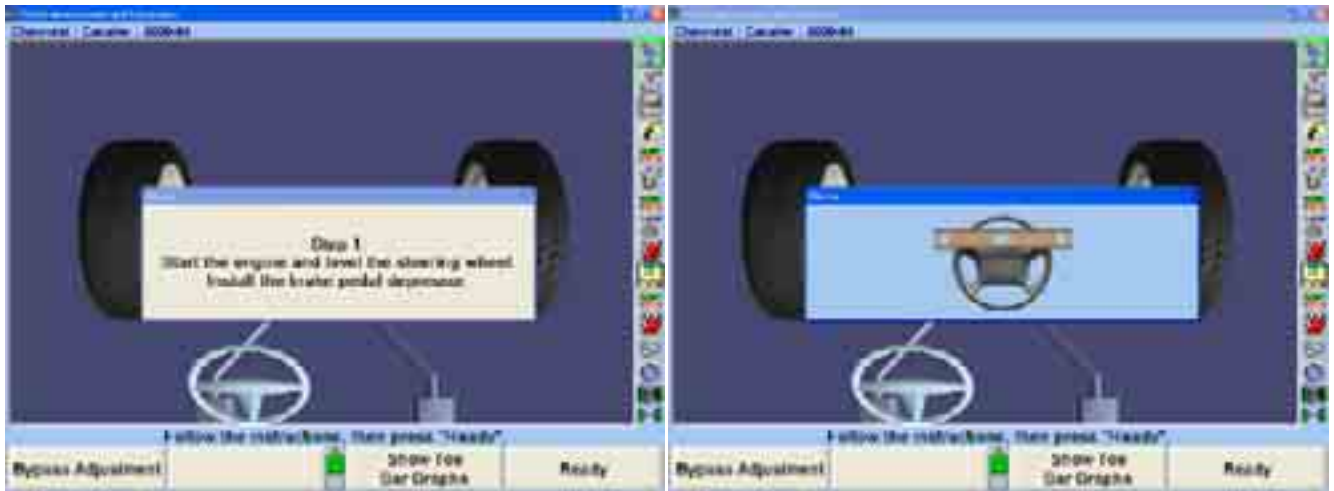


Follow the on-screen instructions, then press “Ready.”



The WINTOE® alignment procedure will begin.

Start the engine and level the steering wheel. Then press “Ready.”



Make the adjustments indicated on the screen. Then press “Ready.”



Make the adjustments indicated on the screen. Then press “Ready.”



Steer ahead to center the bar graph. The steering wheel should be level. If the steering wheel is not level, restart WINTOE® and correct as necessary.



Press the “Vehicle Measurements and Adjustments” icon in the procedure bar and the “Vehicle Measurements and Adjustments” primary screen will appear.

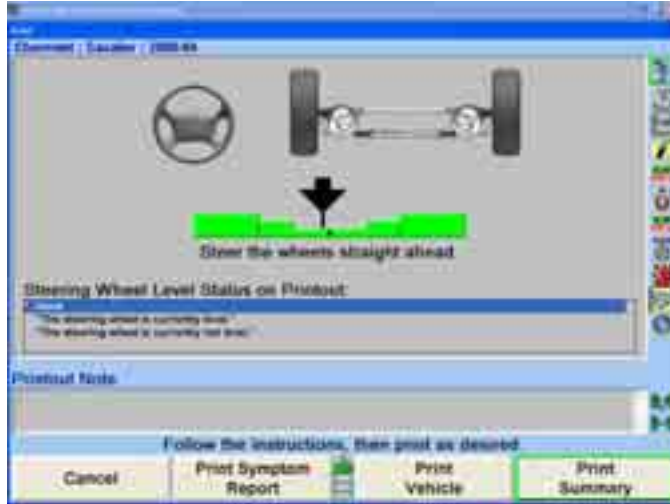


If measurements are not within specification, select “Check With ExpressAlign®” and readjust as necessary.

After all adjustments are completed, select “Print” to print the alignment results.



Before printing, the “Print” popup screen will allow the technician to input the current steering wheel status and make additional notes as needed. After steering ahead, add the necessary comments for the printout and select “Print Summary.”



After printing the results, the “Vehicle Measurements and Adjustments” primary screen will appear with the current vehicle measurements showing. The alignment is complete.



Verify that the pins are in place in the slip plates and turnplates before driving the vehicle off the rack.

1.7 An Example Alignment Job with the ExpressAlign® Adjustment Feature and without DSP400 or DSP600 Sensors

Following are two examples of alignments performed without using DSP400 or DSP600 targets yet still using ExpressAlign®. Each example utilizes different options enabled within the WinAlign® program.

Example 1 (ExpressAlign® / without DSP400 or DSP600)

The “Total Four-Wheel” alignment procedure requires the use of all four sensors and is typically used when adjustments are available for rear camber and/or rear toe.

This example alignment job assumes that the system is configured as follows:

ENABLED
ExpressAlign Level III

Your system may be configured differently.

NOTE:	This section is an overview of an alignment job using the ExpressAlign® feature. For details about any procedure, refer to the appropriate section of the manual or press “HELP” in the WinAlign® program.
--------------	--

Prepare the vehicle for alignment as follows:

Position vehicle onto alignment rack with the front wheels centered on the turning angle gauges.

Place the vehicle transmission in park and apply the parking brake.

Position chocks at front and rear of left rear tire.

Place the lift at alignment height.



NOTE:	The alignment rack must be level to properly perform an alignment.
--------------	--

Inspect for unevenly worn or mismatched tires and adjust tire pressure to vehicle manufacturer’s specification.

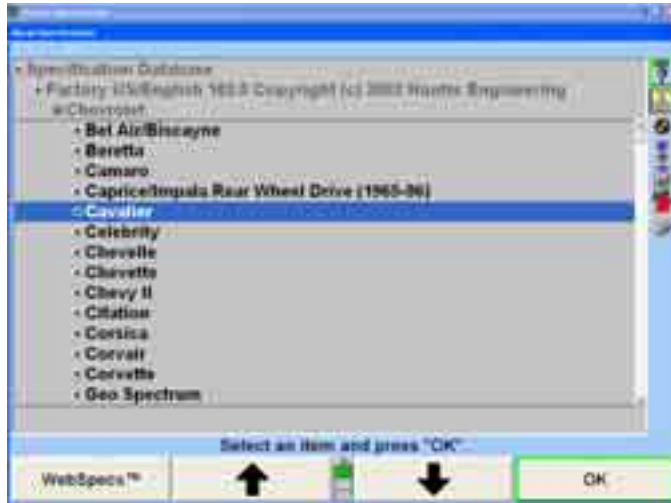
Inspect the suspension and steering linkage components for wear, looseness, or damage.



Start the alignment program by pressing “Begin Alignment” on the “Logo” screen. The “Recall Specifications” popup screen will appear.



Press  or  to highlight the manufacturer of the vehicle being aligned.

Press “OK” to select the highlighted manufacturer. The next screen will list the models available from the selected manufacturer.

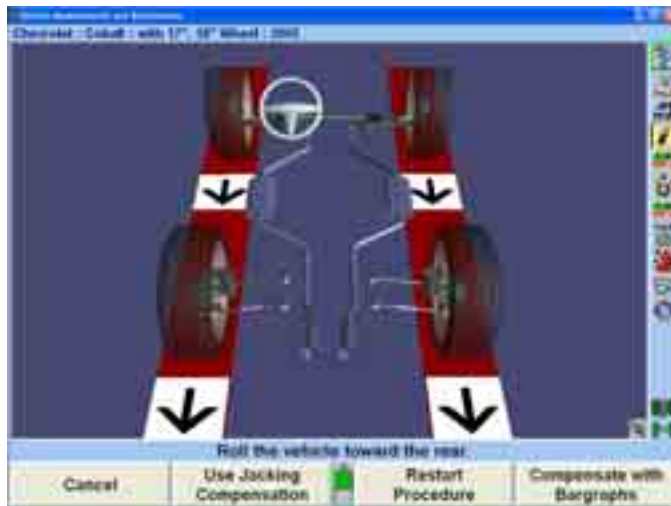


Press  or  to highlight the model of the vehicle being aligned.

Press “OK” to select that model.

Continue in this manner until the vehicle is identified to the program.

When the vehicle is identified to the program, the screen will change to the “Compensation Control” popup screen.



Mount sensors on wheels and compensate them for runout. Refer to “Mounting Sensors or Targets onto Wheel Adaptors,” page 45.

After the sensors have been compensated, remove the pins from the turnplates and slip plates, then lower and jounce the vehicle.

Press the “Measure Caster” icon in the procedure bar. The screen will change to the “Caster and S.A.I. Measurement” popup screen that will direct you to measure caster.



Install the brake pedal depressor, level and lock the sensors, and lower vehicle if raised. Press “Ready.”



Steer the wheels as directed and follow the on-screen directions.

The screen will change to the “ExpressAlign®” menu screen.



NOTE: The actual procedures displayed will vary depending on the vehicle and alignment angles that need to be adjusted.

A suggested procedure will be displayed in the “ExpressAlign®” menu. Selecting the corresponding icon in the procedure bar will start the procedure that the icon represents.

Adjust right rear camber and toe.



If the vehicle you are aligning does not use shims, ExpressAlign® will select and display the appropriate adjustment screen.

Remove the sensor and wheel adaptor to install shim. After installing shim and replacing sensor and wheel adaptor, the sensor must be re-compensated.

By pressing “OK,” the WINTOE® alignment procedure will begin.

Start the engine and level the steering wheel. Then press “Ready.”



Make the adjustments indicated on the screen. Then press "Ready."



Make the adjustments indicated on the screen. Then press "Ready."



Steer ahead to center the bar graph. The steering wheel should be level. If the steering wheel is not level, restart WINTOE® and correct as necessary.



Press the “Vehicle Measurements and Adjustments” icon in the procedure bar and the “Vehicle Measurements and Adjustments” primary screen will appear.



If measurements are not within specification, select “Check With ExpressAlign®” and readjust as necessary.



After all adjustments are completed, select the “Print Summary” icon in the procedure bar to print the alignment results.



After printing the results, the “Vehicle Measurements and Adjustments” primary screen will appear with the current vehicle measurements showing. The alignment is complete.



Example 2 (ExpressAlign® / without DSP400 or DSP600)

The “Total Four-Wheel” alignment procedure requires the use of all four sensors and is typically used when adjustments are available for rear camber and/or rear toe.

This example alignment job assumes that the system is configured as follows:

ENABLED
Display of Vehicle Specifications
Show Measurements Display After Compensation
Show Measurements Display After Caster
Verify Caster Adjustment
ExpressAlign Level III

Your system may be configured differently.

NOTE:	This section is an overview of an alignment job using the ExpressAlign® feature. For details about any procedure, refer to the appropriate section of the manual or press “HELP” in the WinAlign® program.
-------	--

Prepare the vehicle for alignment as follows:

Position vehicle onto alignment rack with the front wheels centered on the turning angle gauges.

Place the vehicle transmission in park and apply the parking brake.

Position chocks at front and rear of the left rear tire.

Place the lift at alignment height.



NOTE:	The alignment rack must be level to properly perform an alignment.
-------	--

Inspect for unevenly worn or mismatched tires and adjust tire pressure to vehicle manufacturer’s specification.

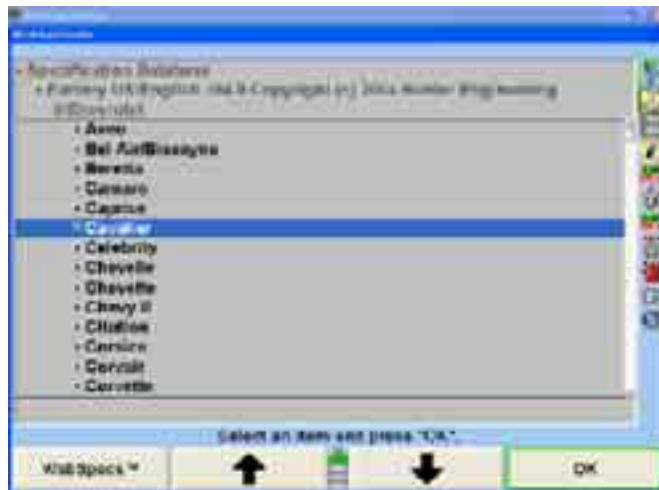
Inspect the suspension and steering linkage components for wear, looseness, or damage.



Start the alignment program by pressing “Begin Alignment” on the “Logo” screen. The “Recall Specifications” popup screen will appear.



Press  or  to highlight the manufacturer of the vehicle being aligned.

Press “OK” to select the highlighted manufacturer. The next screen will list the models available from the selected manufacturer.



Press  or  to highlight the model of the vehicle being aligned.

Press “OK” to select that model.

Continue in this manner until the vehicle is identified to the program.

When the vehicle is identified to the program, the screen will change to the “Vehicle Specifications” primary screen.

The “Vehicle Specifications” primary screen displays the identification and alignment specifications for the vehicle chosen.

Confirm that the vehicle identified is the vehicle you have chosen, and then press the “Mount Sensors and Compensate” icon in the procedure bar.



The screen will change to the “Compensation Control” popup screen.



Mount sensors on wheels and compensate them for runout. Refer to “Mounting Sensors or Targets onto Wheel Adaptors.”

After the sensors have been compensated, remove the pins from the turnplates and slip plates, then lower and jounce the vehicle.

The screen will change to the “Vehicle Measurements and Adjustments” primary screen. The current vehicle alignment measurements are shown on this screen.



NOTE: The actual procedures displayed will vary depending on the vehicle and alignment angles that need to be adjusted.

A suggested procedure will be displayed in the “ExpressAlign®” menu. Selecting the corresponding icon in the procedure bar will start the procedure that the icon represents.

This vehicle uses shims to adjust rear camber and toe. Selecting the “Rear Adjust Camber & Toe” icon in the procedure bar will automatically proceed to Shim Select® II and display the correct shim for the necessary adjustment.



If the vehicle you are aligning does not use shims, ExpressAlign® will select and display the appropriate adjustment screen. Press “OK” after making adjustments and re-compensating the sensor.

Make the adjustments indicated on the screen. Then press “Ready.”



Make the adjustments indicated on the screen. Then press “Ready.”



Steer ahead to center the bar graph. The steering wheel should be level. If the steering wheel is not level, restart WINTOE® and correct as necessary.



Press the “Vehicle Measurements and Adjustments” icon in the procedure bar and the “Vehicle Measurements and Adjustments” primary screen will appear.



Select the “Check With ExpressAlign®” softkey.



After all adjustments are completed, select the “Print” icon in the procedure bar to print the alignment results.

Before printing, the “Print” popup screen will allow the technician to input the current steering wheel status and make additional notes as needed. After steering ahead, add the necessary comments for the printout and select “Print Summary.”



After printing the results, the “Vehicle Measurements and Adjustments” primary screen will appear with the current vehicle measurements showing. The alignment is complete.



2. Basic Operation Information

2.1 Sensors and Targets

Sensors or targets may be mounted on the wheel adaptors before mounting the wheel adaptors on the vehicle. In some cases, it may be easier to mount the wheel adaptor first and then mount the sensor or target onto the adaptor (Either method may be used).

Mounting Sensors or Targets Onto Wheel Adaptors

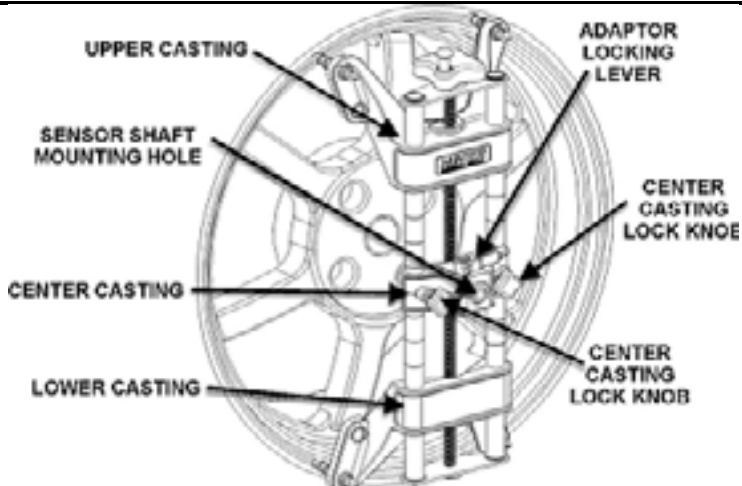
Sensors may be mounted on the wheel adaptors before mounting the wheel adaptors on the vehicle. In some cases, it may be easier to mount the wheel adaptor first and then mount the sensor onto the adaptor. Either method may be used.

Center the wheel adaptor center casting between the upper and lower castings. When the center casting is properly centered, a plunger ball will fall into the detent position on the adaptor rod.

Tighten both center casting lock knobs firmly. This will prevent the center casting from slipping down when the sensor is attached.

CAUTION: Hand tighten center casting lock knobs as tight as possible (DO NOT USE TOOLS TO TIGHTEN).

CAUTION: If the center casting lock knobs are not firmly tightened, runout compensation and alignment accuracy will be adversely affected.

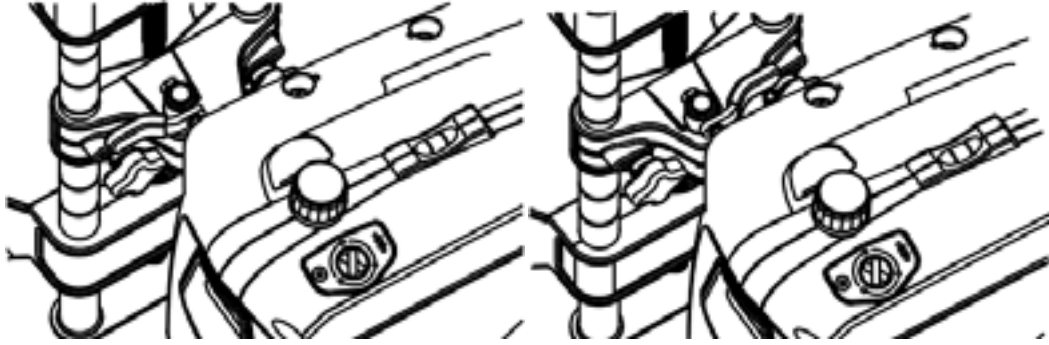


If detached, attach the sensor to the wheel adaptor by inserting the sensor mounting shaft (at the rear of the sensor) into the sensor mounting hole in the middle of the center casting.

NOTE: The sensor shaft must be fully inserted into the sensor shaft mounting hole.

Wheel Adaptor 175-285-1

Rotate the adaptor locking lever clockwise to the locked position.



CAUTION: When mounting sensors to the wheel adaptors, the sensor shaft must be fully seated. Make certain that there is no play or looseness between the sensor shaft and the wheel adaptor. Rotate the wheel while holding the sensor. Listen and feel for movement between the sensor and wheel adaptor. Runout compensation and alignment accuracy will be adversely affected if there is any movement between the sensor and wheel adaptor. Sensors must fit tightly against the surface of the wheel adaptor or the lock may not hold. This could allow the sensor to fall and be damaged.

When the sensor is mounted, the sensor locking lever should be rotated using firm hand pressure. Tools should not be used to force the locking lever. If the lever can be rotated until it contacts the casting and is not fully locked, *refer to “Adjusting Wheel Adaptor Lock Lever.”*

Wheel Adaptor 175-321-1 with Ratchet Adaptor Locking Lever

Rotate locking lever clockwise to tighten. If upper casting prevents rotation of lever, either expand adaptor to move upper casting or re-position the lever by lifting lever up to disengage, rotating counter-clockwise, and lowering to re-engage.

Proceed until the shaft is locked tight to adaptor.

With shaft fully locked, re-position the lever to the 9 o'clock position by lifting lever up to disengage, rotating to 9 o'clock, and lowering to re-engage.

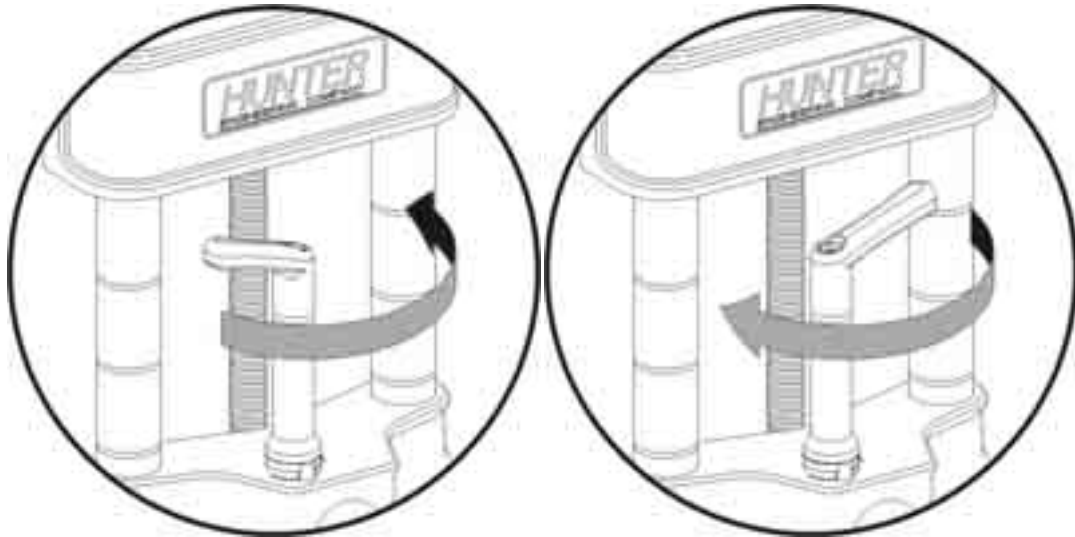


Re-position lever to 9 o'clock

The lever in the 9 o'clock position eliminates possible contact with upper casting or sensor during alignments.

Operation of Ratchet Adaptor Locking Lever after Initial Setup

To remove the sensor or reposition a target, loosen the lock by turning the lever counter-clockwise to the 3 o'clock position.



To loosen, turn lever from 9 to 3 o'clock

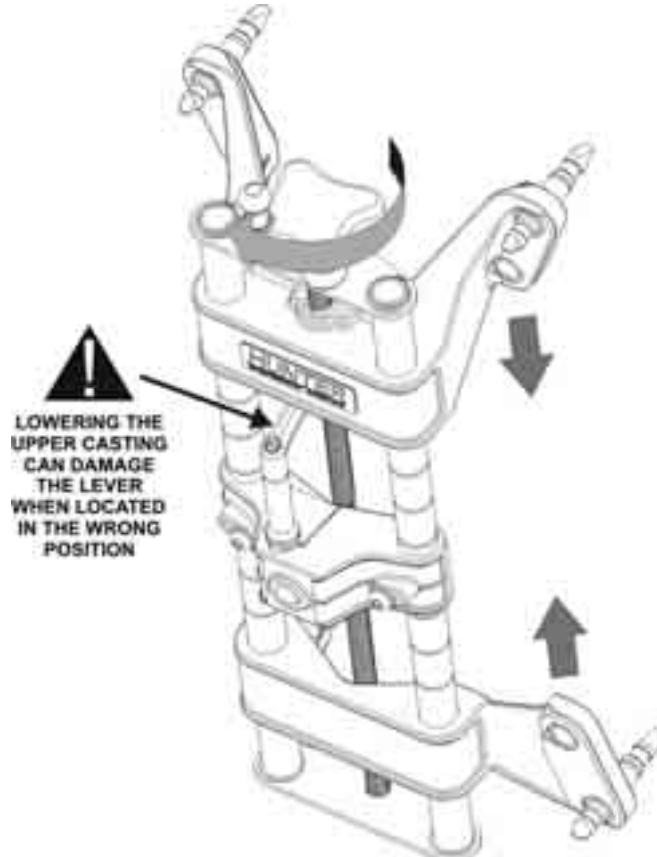
To lock, turn lever from 3 to 9 o'clock

To lock the sensor or target, tighten the lock by turning the lever clockwise to 9 o'clock position.



CAUTION:

Failure to follow tightening and loosening procedures may result in damage to lever. Upper casting can damage lever if contact occurs when going for a large to small diameter rim. Refer to figure below.



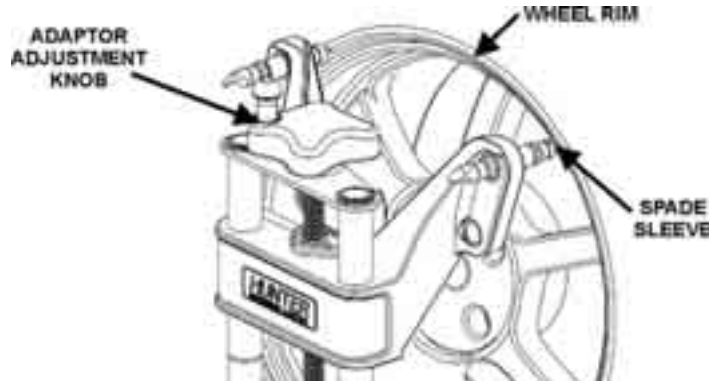
Mounting Wheel Adaptors Onto Wheels

Wheels With No Rim Lip (Attaching To Outer Rim Lip)

Position the wheel adaptor with the two upper external rim studs on the outside of the wheel rim.

Align the two lower external rim studs on the outside of the wheel rim and check that all four rim studs will engage the outside of the wheel rim.

Turn the adaptor adjustment knob to firmly attach the adaptor to the wheel.



Test the security of the installation by lightly tugging on the wheel adaptor.

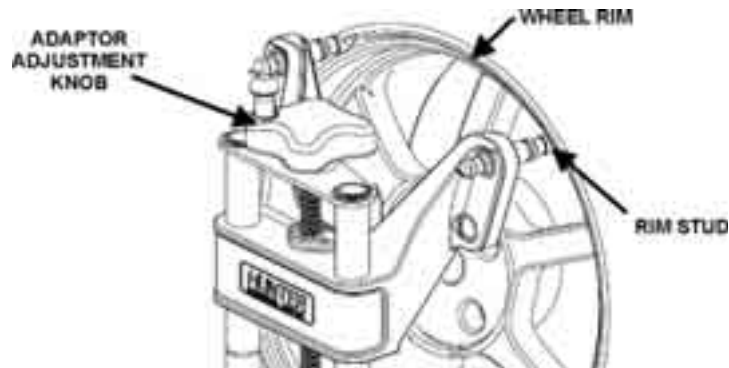
CAUTION: Do not allow the rim studs to slip on the wheel. Runout compensation and alignment accuracy will be adversely affected if the wheel adaptor is allowed to slip on the wheel.

Wheels With Rim Lip (Attaching To Inner Rim Lip)

Position the wheel adaptor with the two lower rim studs engaging the lower wheel rim lip.

Align the two upper rim studs with the upper wheel rim lip and check that all four studs will engage the inner portion of the rim lip.

Turn the adaptor adjustment knob to firmly attach the adaptor to the wheel.



Test the security of the installation by tugging on the wheel adaptor.

CAUTION: Do not use rim studs on alloy or clear coat wheels. Rim studs can damage these wheels.

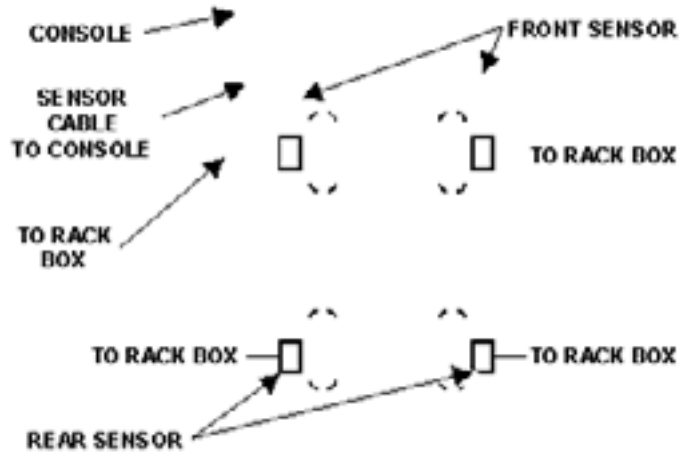
CAUTION: Do not allow the rim studs to slip on the wheel. Runout compensation and alignment accuracy will be adversely affected if the wheel adaptor is allowed to slip on the wheel.

Connecting Conventional Sensor Cables

Connecting Sensor Cables With Optional Rack Wiring Kit

Connect each sensor to a rack wiring box with short sensor cables (either connector may be used).

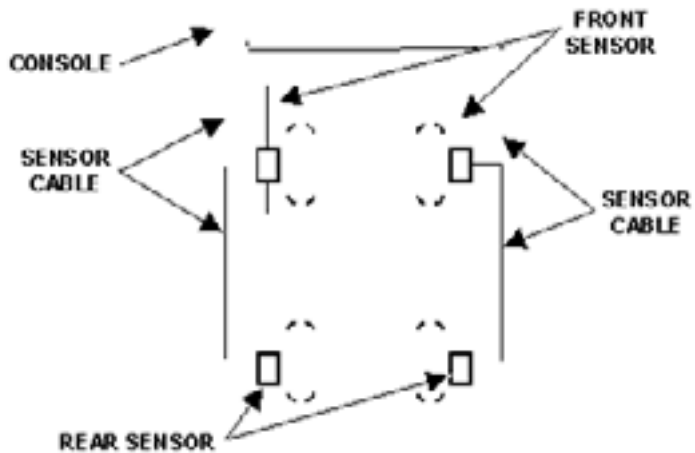
Connect a front rack wiring box to the console with a long sensor cable (any available connector may be used).



Connecting Sensor Cables Without Optional Rack Wiring Kit

Connect the two rear sensors to the front sensors using sensor cables (either front sensor connector may be used).

Connect the two front sensors to the console using sensor cables (any available console cable socket may be used).



Compensating Conventional Sensors - General Compensation of Conventional Sensors

The sensors must be compensated to eliminate error in angle measurements caused by runout of the wheel and wheel adaptor.

The default setting for the alignment console is set for 3-point compensation. The default setting can be changed in Aligner Setup for either 2-point compensation or 3-point compensation (Pro-Comp® compensation).

The operator still has the option to override the default setting by adding 2-point compensation and rolling compensation in Aligner Setup under the Sensors heading / Compensation Options.

When these compensation options are added, softkeys will be available during the compensation procedure.

If a sensor that has been compensated should require re-compensation, pressing the compensate button twice within four seconds will begin the new procedure.

When pressing the sensor compensate button, momentarily depress (do not hold the compensate button). Also, do not disturb the sensor until the red LED responds.

Sensors may be compensated in any order; however, these precautions must be followed:

If a sensor is removed from a wheel, that sensor must be re-compensated when reinstalled. The other sensors do not need re-compensation.

During 2-point compensation and normal operation of conventional sensors, be certain no obstructions are blocking the infrared beams between sensors. Should a blockage occur, the affected sensor(s) shown on the illustration on the CRT will flash on and off and the displayed toe measurement of the sensor(s) will go blank until the obstruction is cleared.

When compensating sensors mounted to the vehicle drive wheels, place the transmission in NEUTRAL.

The lift rack should be level on leveling legs.

Compensating Conventional Sensors - 3-Point Compensation

Not all sensors need to be mounted before starting compensation. The sensors may be mounted and compensated individually or compensation may be performed on 1, 2, 3, or all 4 sensors at once.

Raise either the front or rear wheels.



WARNING: Chock wheels on axle not being raised during compensation to prevent vehicle from rolling.

Select any one of the sensors for compensation. The starting position of the wheel adaptor does not matter. The green LED will be lit.

Snug down the sensor lock knob.

Rotate the wheel until the sensor is level (as indicated by the level on top of the sensor).

Press the compensate button. Do not disturb sensor until the red LED begins to blink and the green LED turns off, indicating that the measurements have been stored.

Loosen the sensor lock knob.

Rotate the wheel 120degrees until the green LED comes on. Snug down the sensor lock knob and rotate the wheel to level the sensor.

NOTE: It is recommended that the front wheels of front wheel drive vehicles be rotated in the forward direction to keep from disturbing the sensor on the opposite front wheel.
--

With the green LED on, press the compensate button. Do not disturb the sensor until the red LED begins to blink faster and the green LED turns off to indicate that the measurements have been stored.

Loosen the sensor lock knob.

Rotate the wheel 120 degrees more until the green LED comes on. Snug down the sensor lock knob and rotate the wheel to level the sensor.

With the green LED on, press the compensate button. Do not disturb the sensor. Wait for sensor to save measurement. The red LED and the green LED will stay on.

Loosen the sensor lock knob.

The sensor is now compensated. Repeat this procedure for the remaining sensor(s).

NOTE: All sensors should be level, but unlocked, with cables hanging straight down to minimize tilt of the sensors during caster sweep. Avoid rapid steering motion that may cause sensors to swing vertically, which can cause them to come into contact with the rack or even dislodge from the wheel.

Remove the lock pins from the turning angle gauges and rear slip plates.

Apply the parking brake and place the transmission in park.

Lower the vehicle onto the turning angle gauges.

Jounce the vehicle.

3-Point compensation is complete. The green LED and red LED on each sensor will be lit.

After 3-point compensation, the wheel may be rotated to any position without affecting the alignment measurements.

Continue the alignment procedure.

Compensating Conventional Sensors - 2-Point Compensation

NOTE: To compensate the sensors, both the front and rear sensor on that side of the vehicle must be mounted and the longitudinal toe beam must not be obstructed. If two sensors (on the same side of the vehicle only) are to be compensated at the same time, the wheels should be rotated at the same time. Do not rotate one wheel while the measurements are being saved at the other. The preferred method is to compensate the sensors separately.

Raise either the front or rear wheels of vehicle.

 **WARNING:** Chock wheels on axle not being raised during compensation to prevent vehicle rolling.

Loosen the sensor lock knobs of all the sensors.

Select any one of the sensors for compensation. The green LED will be on.

Rotate the wheel adaptor to any desired position. Compensation should preferably begin (and end) with the wheel adaptor in the vertical position to provide a visual indication that the vehicle wheel has not rotated.

Snug down the sensor lock knob.

Rotate the wheel until the sensor is level (as indicated by the level on top of the sensor).

Press the compensate button. Do not disturb the sensor until the red LED begins to flash and the green LED turns off indicating that the measurement has been saved.

Loosen the sensor lock knob.

Rotate the wheel 180 degrees until the green LED comes on. When the green LED is on, snug down the sensor lock knob and rotate the wheel to level the sensor.

Press the compensate button. Do not disturb the sensor. Wait for the sensor to save the measurement. The red LED and green LED will stay on, indicating that the measurement has been saved and compensation is complete.

Loosen the sensor lock knob.

The sensor is now compensated. Repeat this procedure for the remaining sensor(s).

When using the 2-point compensation method, the wheel adaptor must remain in the same rotational position as it was when its compensation was completed.

NOTE: All sensors should be level, but unlocked, with cables hanging straight down to minimize tilt of the sensors during caster sweep. Avoid rapid steering motion that may cause sensors to swing vertically, which can cause them to come into contact with the rack, or even dislodge from the wheel.

Remove the lock pins from the turning angle gauges and rear slip plates.

Apply the vehicle parking brake and place the transmission in park.

Lower the vehicle onto the turning angle gauges.

Jounce the vehicle.

2-Point compensation is complete. The green LED and red LED on each sensor will be on.

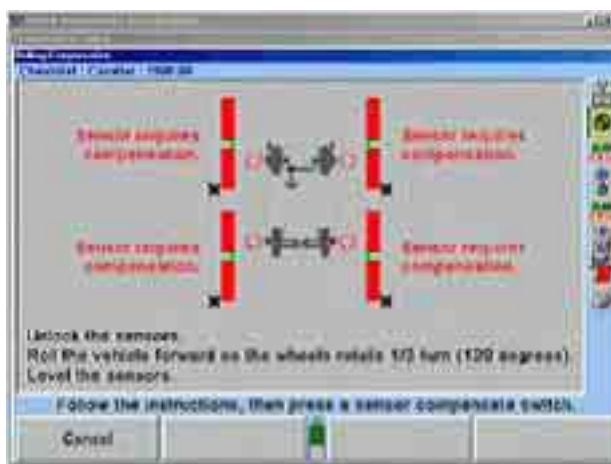
Continue the alignment procedure.

Rolling Compensation for Conventional Sensors

NOTE: This procedure can be performed using the 3-point compensation method.

CAUTION: This procedure should be performed only on a pit-installed rack and should not be performed on a lift or aboveground rack. The vehicle could roll off the lift or rack, causing severe personal injury and damage to the vehicle or rack.

From the “Compensation Control” popup screen, press “Use Rolling Compensation.” The “Rolling Compensation” popup screen will appear.



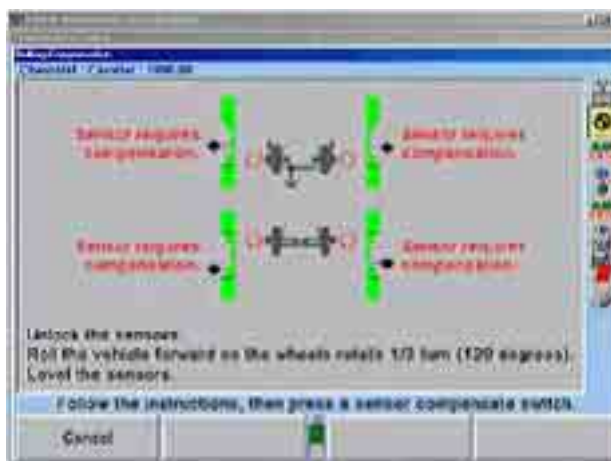
Rolling Compensation for Conventional Sensors - 3-Point Procedure

Position the vehicle so that it can be rolled forward with the wheels able to rotate 240 degrees.

Level and lock the sensors, then press “Ready.” When the sensors are stable, the measurements will be saved.

NOTE: Beginning the rolling compensation procedure removes any compensation from the sensors.

The screen instructs you to roll the vehicle forward so the wheels rotate 180 degrees. Vertical bar graphs show when this is correct. Unlock the sensors and roll the vehicle forward until the arrows are in the null position.



Level and lock the sensors. The green LED must be on at each sensor.

Press and release the compensate switch on any ONE sensor. When the sensors are all stable, the measurements will be saved.

The screen instructs you to roll the vehicle forward so the wheels rotate 120 degrees. Vertical bar graphs show when this is correct. Unlock the sensors and roll the vehicle forward until the arrows are in the null position.

Level and lock the sensors. The green LED must be on at each sensor.

Press and release the compensate switch on any ONE sensor. When the sensors are all stable, the measurements will be saved. The “Rolling Compensation” popup screen will close.

NOTE: The 3-point rolling compensation procedure need not end with the vehicle in the proper position to adjust the alignment. The wheels are allowed to rotate after the procedure is performed.

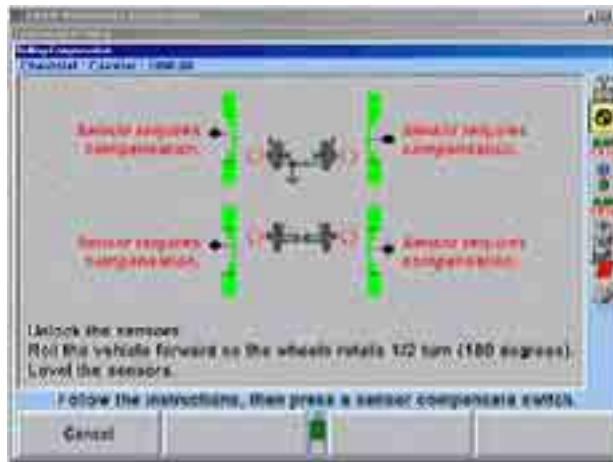
Rolling Compensation for Conventional Sensors - 2-Point Procedure

Position the vehicle so that it can be rolled forward, with the wheels able to rotate 180 degrees.

Level and lock the sensors, then press “Ready.” When the sensors are stable, the measurements will be saved.

NOTE: Beginning the rolling compensation procedure removes any old compensation from the sensors.

The screen instructs you to roll the vehicle forward so the wheels rotate 180 degrees. Vertical bar graphs show when this is correct. Unlock the sensors and roll the vehicle forward until the arrows are in the null position.



Level and lock the sensors. The green LED must be on at each sensor.

Press and release the compensate switch on any ONE sensor. When the sensors are all stable, the measurements will be saved.

The “Rolling Compensation” popup screen will close.

NOTE: The 2-point rolling compensation procedure **MUST** end with the vehicle in the proper position to adjust the alignment. The wheels are **NOT** allowed to rotate after the procedure is performed.

Procedure Limitations



CAUTION: This procedure must be performed very carefully, or inaccurate alignment measurements will result. The axles must always “point” exactly the same direction during the procedure. A change in the pointing direction of an axle during the procedure will be interpreted by the system as runout.

Do not allow the front wheels to change their “steering” direction as the vehicle is rolled.

Do not perform the procedure on a bumpy or uneven surface.

Do not perform the procedure on a vehicle that has uneven or out-of-round tires.

Do not push or pull the vehicle by the tires or wheels during the procedure.

Push the vehicle only forward during the procedure. Do not push the vehicle forward, then backward.

Do not use the brakes during the procedure.

Compensating DSP400/600 Targets - General Compensation

The DSP400/600 Targets™ must be compensated to eliminate errors in angle measurements caused by runout of the wheel, wheel adaptor, and target shaft.

The default setting for the alignment console can be set for either rolling or jacking compensation.

When using Jacking Compensation, targets may be compensated in any order; however, these precautions must be followed:

If a target is removed from a wheel, that target must be recompensated when reinstalled. The other targets do not need recompensation.

When compensating targets that are mounted to the vehicle drive wheels, place the transmission in NEUTRAL.

The lift rack should be level on the leveling legs when the legs are present on the lift.

The lock pins must be in place on the turnplates and rear slip plates during rolling target compensation.

Compensating DSP400/600 Targets - About Rolling Compensation

When performing rolling compensation with Hunter DSP400/600 Targets (or any alignment sensors), follow these guidelines to obtain the best results.

Perform a vehicle inspection before beginning alignment

Inspect vehicle for loose or worn parts that may prevent proper alignment.

WinAlign® software will notify the operator if the vehicle has excessive “total toe” with Roll-Check®. Excessive “total toe” is a good indication of loose or worn parts.

Do not perform the procedure on a vehicle that has uneven or out-of-round tires.

Changing to “Live Planes” within WinAlign® software will compensate for uneven tires during the alignment. The vehicle's on-road performance will still be adversely affected by uneven tires.

Properly set tire pressure before performing procedure.

Changing to “Live Planes” within WinAlign® software will compensate for improperly set tire pressure during the alignment. The vehicle's on-road performance will still be adversely affected by improper tire pressure.

Practices to follow for best results

Have the wheels in the straight-ahead position, as the wheels typically are after driving the vehicle onto the lift.

WinAlign® software will notify the operator if the vehicle is not steered straight-ahead. Roll-Check® screen appears and helps the operator straighten the wheels.

Watch for changes in the “steering” direction as the vehicle is rolled. If “steering” direction changes are noticed, re-compensate using a steering wheel holder.

On Hunter Lifts, position a turnplate bridge, Kit 20-1471-1, within the gap behind each turnplate to create a smooth rolling surface.

The alignment lift should be level to place the vehicle's suspension and steering systems in their neutral positions.

Changing to “Live Planes” within WinAlign® software will compensate for an alignment lift that is not level.

Roll the vehicle by rotating the left rear tire. Changes in the vehicles path and ride height are avoided by moving the vehicle with the left rear tire.

Compensating DSP400/600 Targets - DSP400/600 Rolling Compensation

The default setting for DSP400/600 compensation is “Rolling Compensation using the Virtual View.” With this setting the compensation screen will automatically proceed to Rolling Compensation. If Jacking Compensation has been changed to the default setting from the “Compensation Control” popup screen, press “Use Rolling Compensation.” The “Rolling Compensation” popup screen will appear. Rolling compensation can be performed in Virtual View™, or using traditional bar graphs.



Verify that the pins are in the turnplates and slip plates. Position a turnplate bridge in each pocket behind the turnplate so the runway surface and the bar surface are flush. Rotate the bridges so they are taller than wide.



Place wheel chocks that limit rearward motion approximately 15 inches behind rear wheel(s).

Steer ahead.

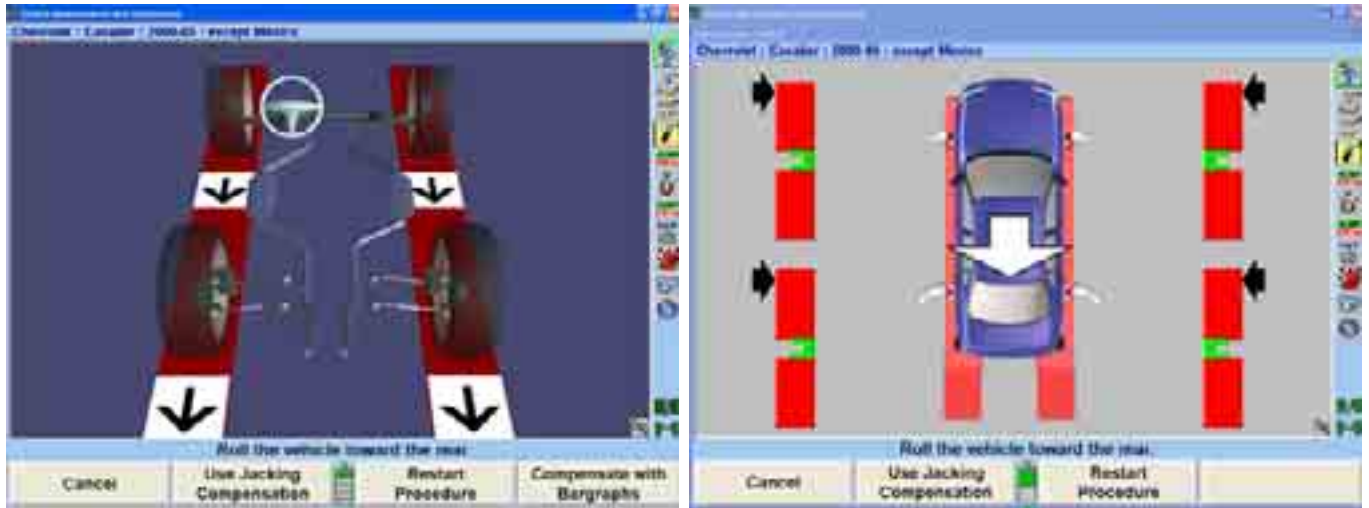
Mount the targets and wheel adaptors on the wheels. Refer to “Mounting Sensors or Targets Onto Wheel Adaptors.”

NOTE: Once the targets are leveled (for compensation), they should not be re-leveled at any time during the alignment. If the target is removed from the wheel or adaptor during the alignment, it must be re-leveled and recompensated, using jacking compensation.

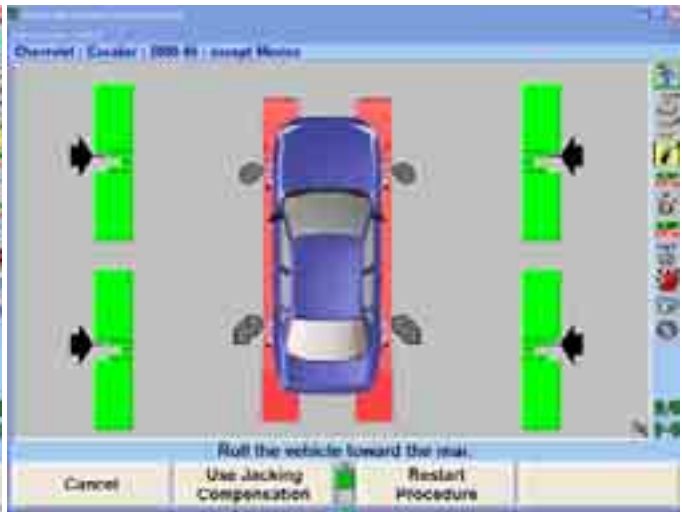
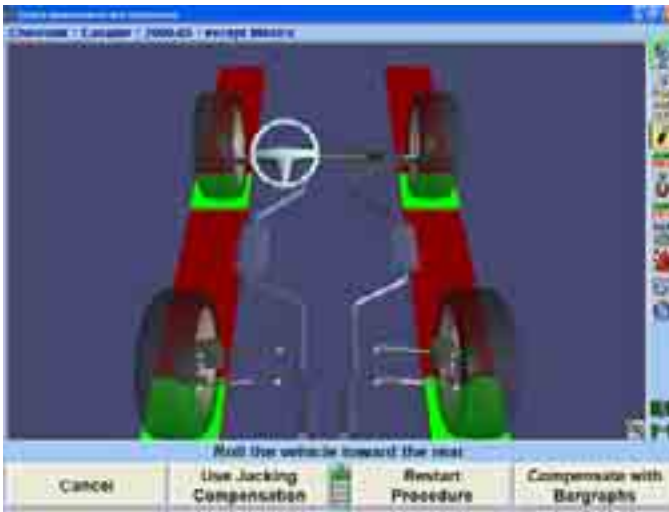
NOTE: Beginning the rolling compensation procedure removes any previous compensation from the targets.

NOTE: It is recommended to roll the vehicle by rotating the left rear tire. Do not push or pull the vehicle by the front (steering axle) tires or wheels during rolling compensation. Do not push or pull on spoilers, fascia moldings, or other “trim” accessories.

The screen instructs you to roll the vehicle rearward. Release parking brake and put transmission in neutral. Roll the vehicle rearward until the bar graph turns green.



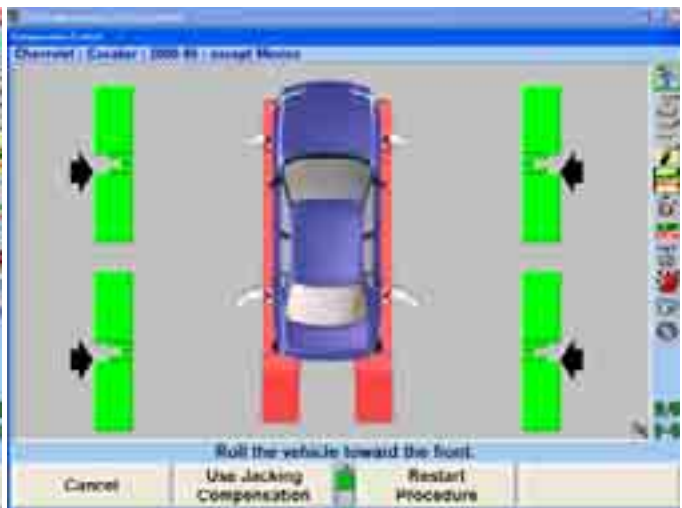
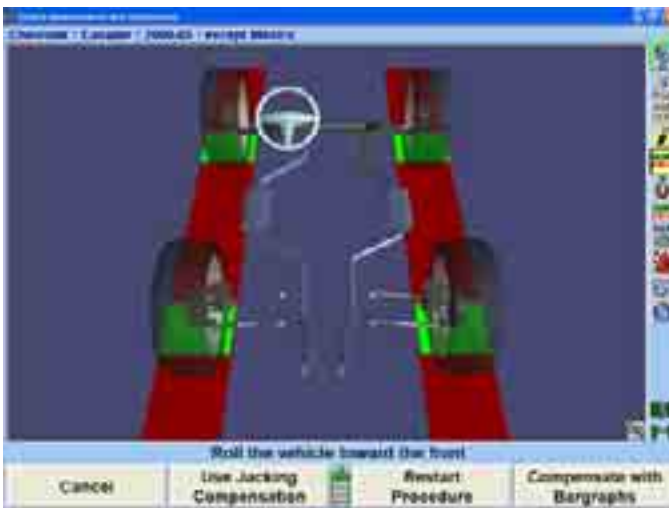
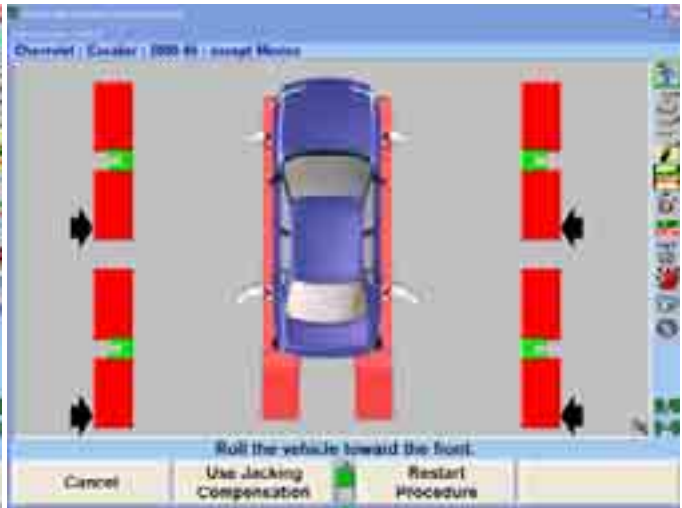
NOTE: A vehicle with 28 inch diameter tires will require approximately 12–14 inches of movement. Smaller diameter tires will require less movement, while larger diameter tires will require more.



Stop rearward movement of the vehicle. The bar graph (arrow) will disappear for a moment.

If a remote indicator is used, indicators for all four wheels will be flashing, indicating to roll forward.

When the compensation bar graph (arrow) reappears, roll the vehicle toward the front until the bar graphs are green.



When all four targets have been compensated, apply the vehicle parking brake and place the transmission in park, if applicable. On standard transmission vehicles, the transmission should be placed in neutral.

Position chocks at the front and rear of the left rear tire to keep the vehicle from rolling.

NOTE:	The rolling compensation procedure MUST end with the vehicle in the proper position to check and adjust the alignment. The targets are NOT allowed to rotate after the procedure is performed.
-------	--

After the targets have been compensated, final compensation instructions will appear.



If not already done, block the wheels, then remove the pins from the turnplates and slip plates.

Remove or rotate the turnplate bridges so they are wider than tall.

NOTE:	On Hunter lift racks, the turnplate bridges can be stored in the same gap behind the turnplates. Rotate the bridges so they are wider than tall. Rotating the bridges is necessary to prevent interference with turnplate movement.
-------	---

Rolling compensation is complete.

Roll-Check® Measurement Feature

After performing rolling compensation, it is necessary that the vehicle is steered ahead and that “Total Toe” is not excessive. Roll-Check™ verifies that both of these conditions have been met. If either of these conditions has not been met, then a popup screen appears stating that the rolling compensation that has just been performed may not be accurate.

One of the two following messages with options might appear after rolling compensation:



The vehicle is not steered ahead.

Using the Steer Ahead bar graph, steer the vehicle to straight ahead and then press “Restart Procedure” OR press “Use Jacking Compensation.”



Total Toe is larger than the preset tolerances.

Adjust Total Toe and press “Restart Procedure” OR press “Use Jacking Compensation.”

Jacking Compensation

When using Jacking Compensation, targets may be compensated in any order; however, these precautions must be followed:

If a target is removed from a wheel, that target must be re-compensated when reinstalled. The other targets do not need re-compensation.

When compensating targets that are mounted to the vehicle drive wheels, place the transmission in NEUTRAL.

The lift rack should be level on the leveling legs (if present).

It is not necessary for all targets to be mounted before starting compensation. The targets may be mounted and compensated individually, or compensation may be performed on one, two, three, or all four targets at once.



Raise the axle requiring compensation while remembering to use the safety on all jacks.

Mount the targets and wheel adaptors on the wheels. *Refer to the section "Mounting Targets."* After the target is mounted, press "Ready."

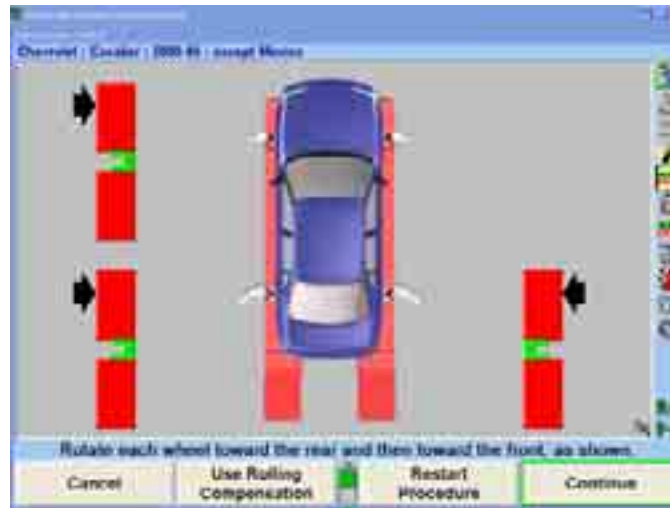
The screen will change as shown below.



Rotate the wheel being compensated toward the rear of the vehicle (as if the vehicle were moving rearward).

When the bar graph that corresponds to the wheel being compensated turns green, stop rotating the wheel. The bar graph will disappear for a moment.

When the bar graph reappears, rotate the wheel toward the front of the vehicle (as if the vehicle were moving forward) until the bar graph turns green again. If compensation was completed properly, the bar graph will disappear.



The target is now compensated. Repeat this procedure for any remaining target(s).

After the targets have been compensated, final compensation instructions will appear.



Remove the lock pins from the turnplates and slip plates.

Apply the parking brake and place the transmission in park, if applicable.

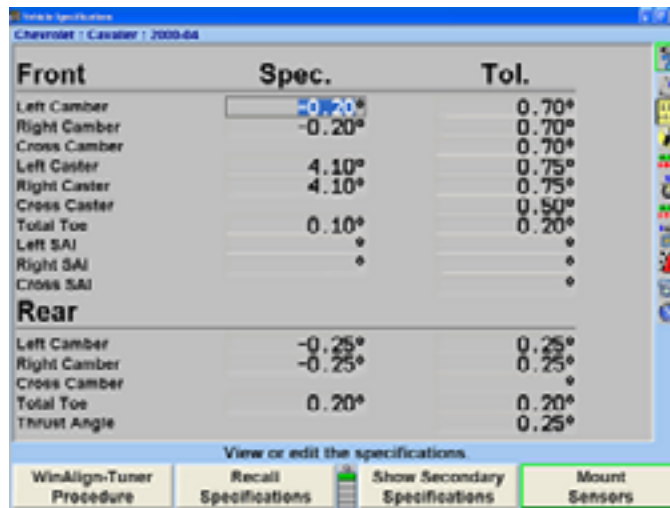
Lower the vehicle onto the turnplates and rear slip plates.

Jounce the vehicle.

Jacking compensation is complete.

2.2 Vehicle Specifications

The “Vehicle Specifications” primary screen shows the vehicle identification and its alignment specifications.



This primary screen is displayed by pressing “Vehicle Specifications” on any other primary screen. To change to one of the other primary screens, change to the second row of softkey labels, and press the appropriate softkey.

The “Vehicle Specifications” primary screen is used for the following purposes:

- Viewing the identification of the vehicle.
- Viewing the specifications of the vehicle.
- Manually entering the specifications of the vehicle.

The “Vehicle Specifications” primary screen is also used for:

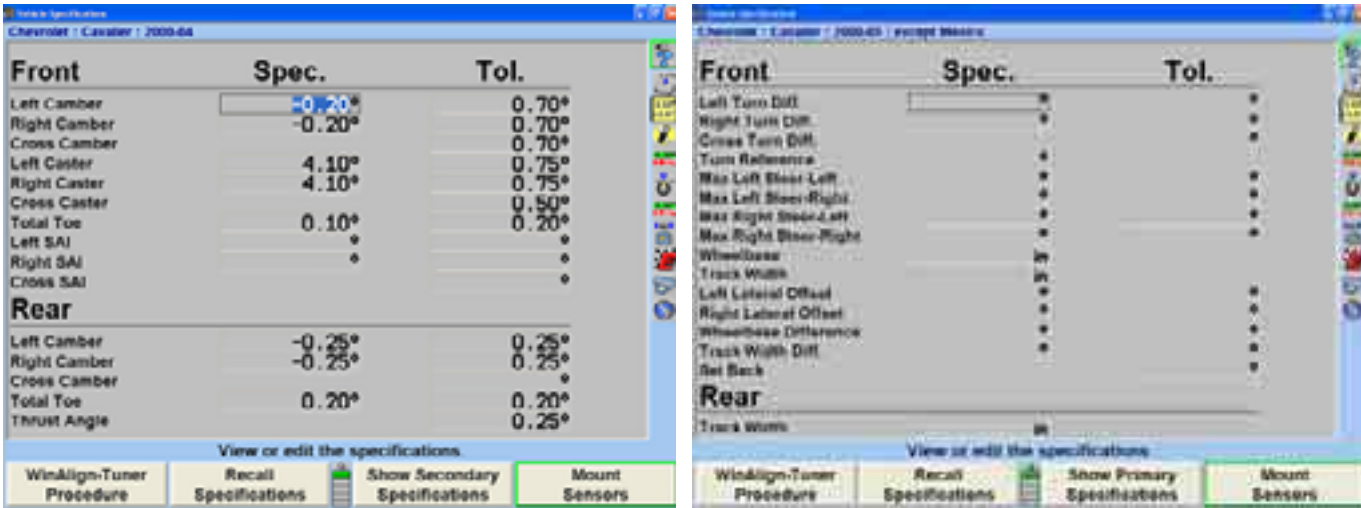
- Recalling vehicle specifications from the specification memory.
- Storing vehicle specifications into the specification memory.
- Reading and writing notes which are attached to the specifications of a vehicle.
- Setting the display units and formats for specifications and measurements.

Primary and Secondary Specification Groups

The specifications and tolerances are shown in two different groups:

“**Primary Specifications**” are the usual camber caster total toe and thrust angle specifications and tolerances.

“**Secondary Specifications**” are S.A.I., toe-out-on-turns and maximum steering angle specifications and tolerances.



You may select “Show Primary Specifications” or “Show Secondary Specifications” from the “Vehicle Specifications” primary screen. “Secondary Specifications” displays both the front and rear axle. Secondary Specifications can be accessed from any primary screen where the “Show Vehicle Specifications” softkey is available.

Vehicle Specification Memory

The “Recall Specifications” popup screen allows vehicle specifications to be recalled and stored in the specification memory.

The “Recall Specifications” popup screen is displayed by pressing “Recall Specifications” on the “Vehicle Specifications” primary screen.



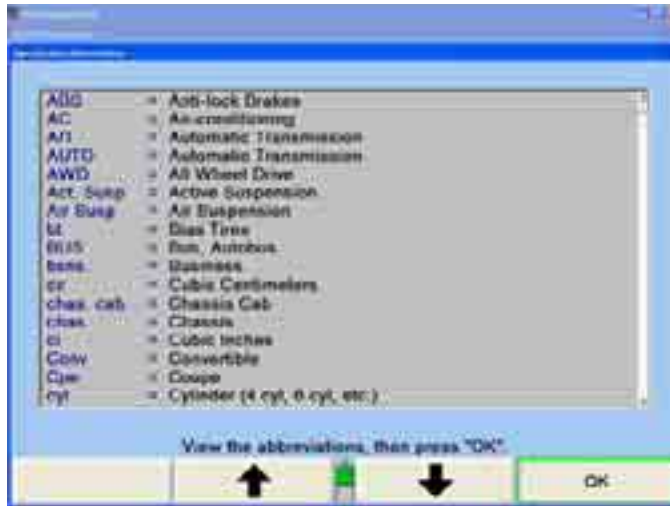
Specifications may be recalled from “Factory Specifications,” based on original equipment manufacturer specifications, “Factory Amendments,” or “User

Specifications.” “Factory Amendments,” and “User Specifications” are created and stored into the computer’s memory by the equipment operator.

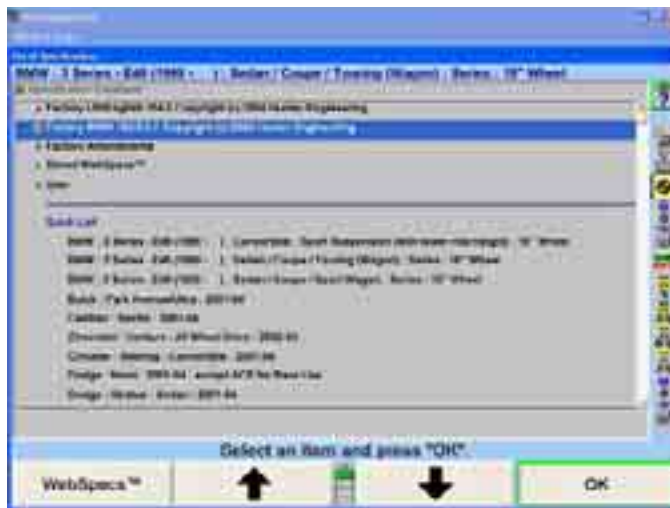
Although the specification database is extensive, some vehicle manufacturers and/or specific models may not be included in the factory specifications memory. Locate the alignment data in the alignment specification book or vehicle manufacturer’s service manual and manually enter the specifications on the “Vehicle Specifications” display.

The manually entered specifications may be stored in computer memory to be recalled at a later time. Refer to “Selecting User Specifications,” page 65.

Pressing “List Abbreviations” identifies a list of abbreviations used in “Factory Specifications.”





Also displayed in Recall Specifications is the “Quick List.” The “Quick List” displays all the vehicles most recently worked on, as shown below.





The Quick List is not erased, but each new vehicle entry overwrites an older entry.

Vehicle Recall Specifications Selection

To recall the specifications from the specification database, begin by pressing  or  to highlight the manufacturer of the vehicle being aligned. Press “OK” to select the highlighted manufacturer. The screen will change to show the models available for the selected manufacturer.



Press  or  to highlight the vehicle model. Press “OK.” Continue in this manner until the vehicle is completely identified. When the vehicle is identified, the specifications will be recalled and the screen will change to the “Vehicle Specifications” primary screen.

At any point in the selection sequence, you can type in the desired selection using the keyboard. For example, when selecting the vehicle manufacturer, you can select “Chrysler” as follows:

Type “C”; the selection changes to “Cadillac.”

Type “H”; the selection changes to “Chevrolet.”

Type “R”; the selection changes to “Chrysler.”

The more letters typed the more accurate the selection. This is also valid within the vehicle make selection.

In Set-up, you may select one of four sequences by which the vehicle is identified.

The four choices are:

Optimal

Year, Manufacturer, Model

Manufacturer, Year, Model

Manufacturer, Year and Model

Selecting from the Vehicle Lists

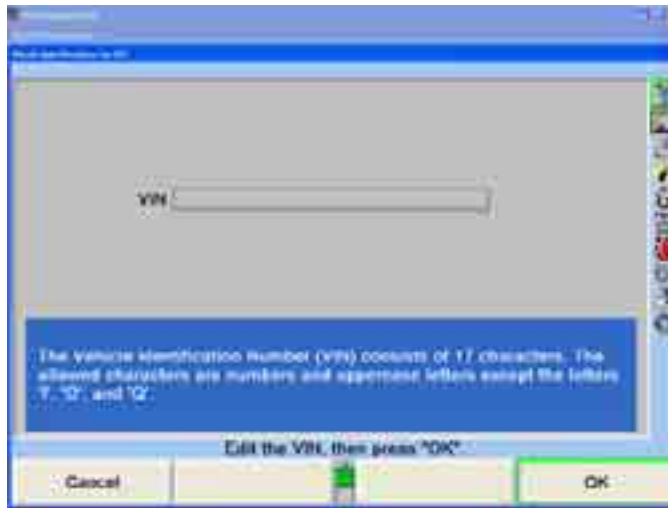
The factory specifications stored in the system are based on industry data available at the time of entry. Because specifications are subject to change, refer to vehicle manufacturer’s service manual and service bulletins if a question arises.

Selecting by Vehicle Identification Number (VIN)

The seventeen-digit Vehicle Identification Number (VIN) contains coded information that the aligner software can use to recall the vehicle specifications.

NOTE:	Recalling vehicle specifications using VIN can be used for 1981 or newer passenger cars. This method will not work for trucks, pick-ups, vans, mini-vans, or utility vehicles.
--------------	--

To recall vehicle specifications using the VIN, press “Recall by VIN...” on the first “Vehicle Specifications” popup screen. The “Recall Specifications By VIN” popup will appear.



Enter the seventeen-digit VIN using the keyboard, and then press “Enter” or “OK.”

Some VIN (numbers) may not contain enough information to completely describe a vehicle. If more than one vehicle is found, a list of vehicles will be displayed. The correct vehicle must be selected by highlighting the correct item and pressing “OK.”

If the aligner software finds the VIN to be invalid, a screen with an error message will appear. Press “Enter” or “OK” and edit the VIN.

The VIN entered may have been misread when recorded from the vehicle or improperly entered. Verify the VIN and type again if an error was found.

If the message “Vehicle Not Found” appears on the screen, the program is unable to identify the required specifications according to the VIN that has been entered. If this occurs, the aligner will return to the “Recall Specification” display and the user will need to manually select the vehicle identification.

Once a vehicle has been identified, the program will retrieve the selected vehicle’s specification from the specification memory, as if the vehicle had been identified by the normal selection sequence.



Selecting “User Specifications”



The system can store “user entered” specifications in addition to those contained in the factory specification memory. These specifications may be for older vehicles no longer in the factory specification memory, or a user may modify factory specifications for a specific vehicle. These specifications may be recalled and used during an alignment.

To recall specifications from the “User” specification memory, the “Recall Specifications” popup screen must be currently displayed:

Press  or  to highlight “Specification Database.”

Press “OK.” The screen will change to a list of possible database selections.

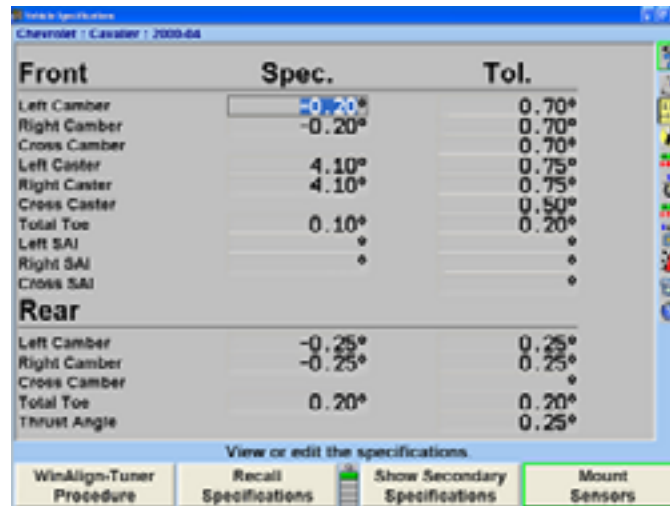
Press  or  to select “User” and press “OK.” The screen will change to list user entered specifications.

Press  or  to highlight the desired item and press “OK.” The vehicle specifications will be retrieved from the “User” specification memory. When the specifications have been retrieved, the screen will change to display those specifications.

Editing Specifications - Entering and Editing Specifications

If specifications for a vehicle are not included in the factory specifications memory, the alignment information must be found in the alignment specification book and entered manually. It may be necessary to change the specification or tolerance of an existing specification.

To change or enter a value on the “Vehicle Specifications” display, press “Select Next Value” or “Enter” to advance to the desired field. Enter the new specification and press “Select Next Value” or “Enter” to replace the existing specification.



	Spec.	Tol.
Front		
Left Camber	-0.20°	0.70°
Right Camber	-0.20°	0.70°
Cross Camber		0.70°
Left Caster	4.10°	0.75°
Right Caster	4.10°	0.75°
Cross Caster		0.50°
Total Toe	0.10°	0.20°
Left SAI	*	*
Right SAI	*	*
Cross SAI		*
Rear		
Left Camber	-0.25°	0.25°
Right Camber	-0.25°	0.25°
Cross Camber		*
Total Toe	0.20°	0.20°
Thrust Angle		0.25°

View or edit the specifications.

WinAlign-Tuner Procedure Recall Specifications Show Secondary Specifications Mount Sensors

Tolerances must not be “0.”

Specifications may be entered as whole numbers (1), whole numbers and fractions (1 1/2), fractions (1/2), decimals (0.5), degrees (1.01°), or degrees and minutes (1° 30'). Use the following methods to enter alignment specifications using the current display units.

NOTE: Display units (i.e. degrees to inches, degrees to degrees and minutes, etc.) can be changed from the “Vehicle Specifications” primary screen. Refer to “Selecting Display Units,” page 83.

Use the “Space” key to separate whole numbers and fractions.

For example, 2 1/2° would be entered as,

Press **2** **Spacebar** **1** **/** **2** and “Select Next Value.”

Use the “Space” key to separate degrees and minutes.

For example, 2° 15’ would be entered as,

Press **Spacebar** and “Select Next Value.”


If the degrees and minutes specification is less than 1°, enter a “0” for degrees.

For example, 6’ would be entered as,

Press **0** **Spacebar** **6** and “Select Next Value.”

NOTE: Specifications are assumed to be positive unless the negative (-) sign is positioned before the specification value.

When “Select Next Value” or “Enter” is pressed, the value is entered and the cursor advances to the next entry field.

 **CAUTION:** Values are not entered until “Select Next Value” or “Enter” is pressed.

Specifications and tolerances may be changed at any time during the alignment by pressing “Vehicle Specifications” and advancing the cursor to the position for the new value to be entered.

Selecting Specification Formats

Specifications may be displayed in a symmetrical or non-symmetrical manner. Specifications that use an equal tolerance range for an angle such as:

	specification	tolerance
Left camber	0.50°	± 0.25°

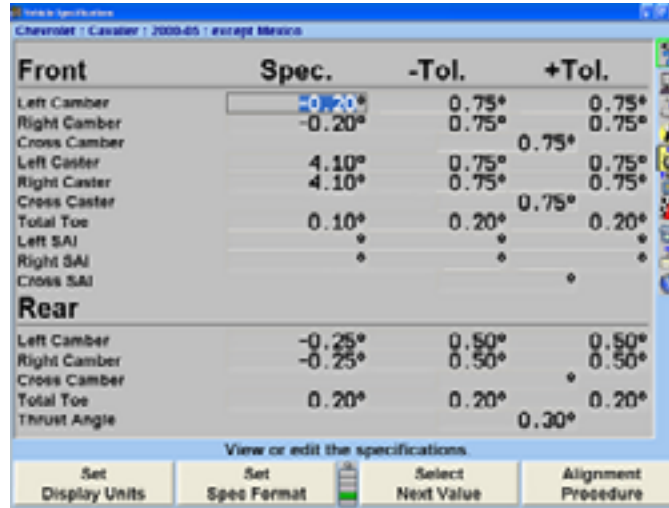
These are called symmetrical specifications because the tolerance range extremes are equal distance from the preferred specification. This permits a ± value to be used as a tolerance and does not require two placeholders for tolerances. Symmetrical specifications are most common.

Non-symmetrical specifications use an unequal ± tolerance such as:

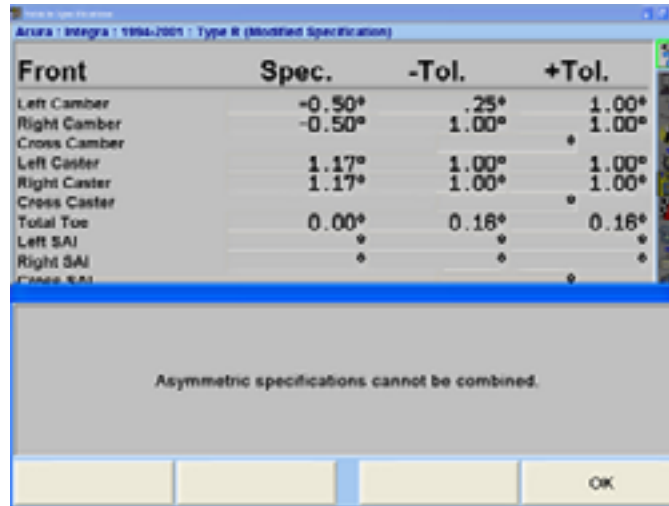
	specification	+ tolerance	- tolerance
Left camber	0.50°	0.50°	0.30°

The tolerance values require two placeholders on the specification screen because the tolerance extremes are unequal distances from the preferred specification.

Press “Set Spec Format,” if individual + and - tolerance values are to be entered. The screen will change to display a positive and negative tolerance position for each specified angle.



If the format is asymmetric and the “+ tolerance” is not equal to the “- tolerance” for at least one tolerance pair, then the screen cannot be changed to symmetric format. Attempting to do so will generate an error message.



Press “Enter” or “OK” to clear this error message.

Reducing Tolerances

Tolerances that are too large may allow a less than desirable alignment while tolerances that are too small may make adjustments difficult.

Pressing “Reduce Tolerances” will reduce the specification tolerances to the following:

front and rear camber tolerance to $\pm 0.25^\circ$ ($1/4^\circ$),

front caster tolerance to $\pm 0.50^\circ$ ($1/2^\circ$),

front and rear total toe tolerance to $\pm 0.06''$ ($1/16''$, 0.13° or 1.5 mm depending upon toe units selected).

The actual angle specification will not be altered and only tolerances greater than these will be reduced.

Storing Specifications - Specification Notes

A “specification note” is a block of text that may be attached to a vehicle specification and stored with the specifications in the specification memory. The note may be stored with factory specifications, factory amended specifications, or with user specifications.

NOTE:	Some factory specifications may already have a note attached. This might be a technical service bulletin, or some tip that may aid you in selecting the vehicle or adjusting its alignment.
--------------	---

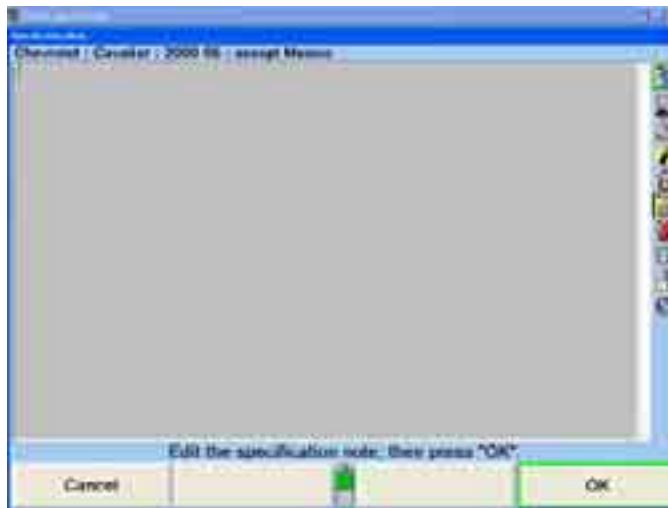
To enter and store a specification note, do either of the following:

Recall the specifications in the usual manner. On the “Vehicle Measurements and Adjustments” primary screen, press “Show Spec Note.”

OR

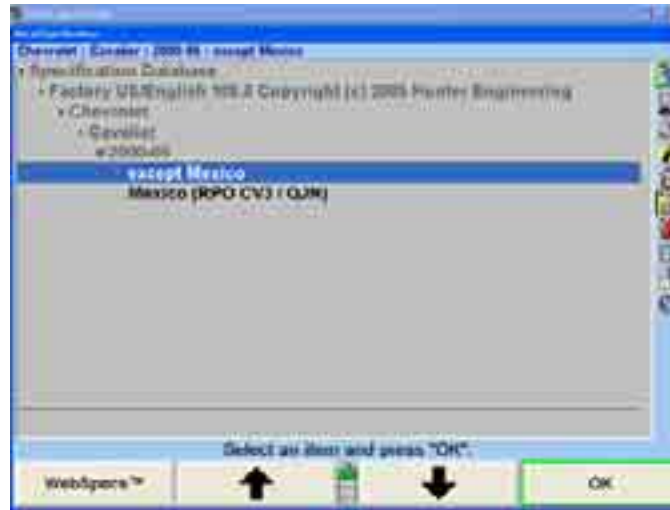
Open the “Recall Specifications” popup screen. Select the vehicle, press “OK” for the final selection. The “Show Spec Note” softkey will be available on the screen at this point. Press “Show Spec Note.” This allows you to view the note without recalling the specifications.

The “Specification Note” popup screen will appear.



Use the keyboard to type and/or edit the note as desired. Pressing “Cancel” will close the popup screen without altering the note. Pressing “OK” will store the note in the specification memory with the vehicle.

If a vehicle in the specification memory has a note attached, it will have a small image of a “note with a paper clip” next to it (as shown by the arrow) in the “Recall Specifications” popup screen.



Storing Specifications - Storing “User Specifications”

The program can store vehicle specifications that you enter and identify directly.

These specifications can take two forms:

- They can be manually entered onto a blank specification screen.

- They can be derived from a factory specification by recalling and then editing the specifications for a vehicle.

The specifications can then be stored in two locations:

- If they were manually entered onto a blank specifications screen, they can be stored in “User” specification memory.

- If they were derived from a factory specification, they can be stored in “User” specification memory or they can be stored in the “Factory” specification memory as an “Attachment” to the factory specification.

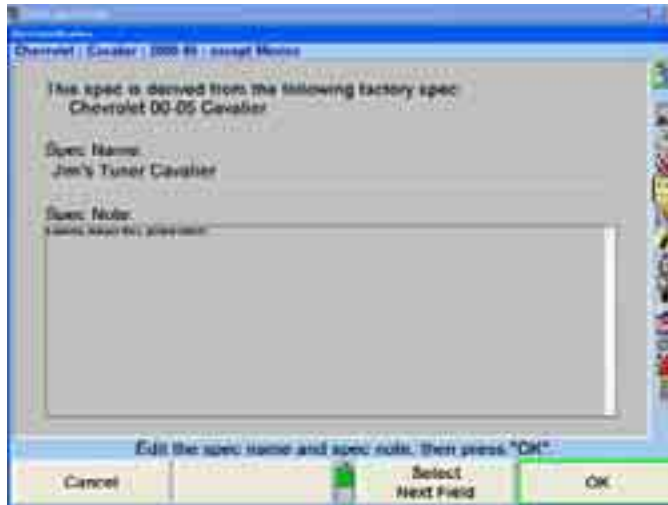
To store a specification:

- On the “Vehicle Specifications” primary screen, press “Clear All Specifications.” Then manually enter the specifications in the usual manner.

OR

- Recall the vehicle specifications from the specification memory. Then manually edit the specifications as needed. This derives the specifications from the factory specifications.

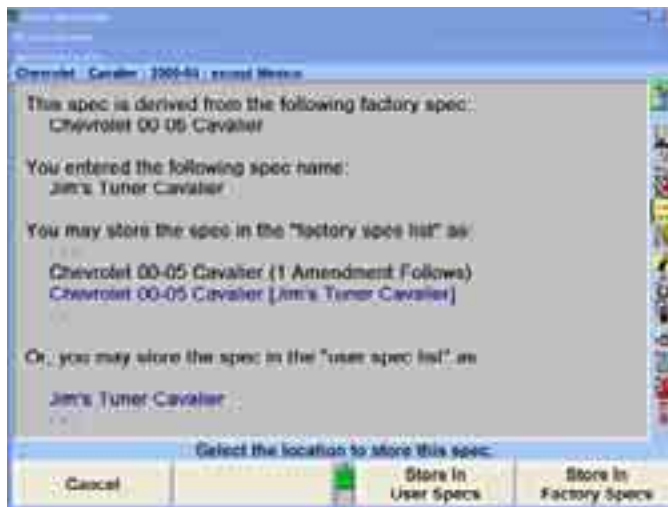
When the specifications are ready to store, press “Store Specifications.” The “Store Specification” popup screen will appear.



Type in the identification of the vehicle. This is the name of the vehicle that will appear on the “Specification Recall” popup screen, and at the top of the “Vehicle Specifications” primary screen.

Press “Next Field” or “Tab,” and the cursor will move to the “Spec Note” field. Type in any desired notes concerning the vehicle, such as Technical Service Bulletin information.

Press “OK.” If the specifications were not derived from a factory specification, they will be immediately stored in the user specification memory. If they were derived from a factory specification, the “Specification Location” popup screen will appear. Now you must decide where to store the specification.



Press “Store In User Specs” or “Store In Factory Specs” to specify the memory where the new specification will be stored.



When saving to “User” specifications, if the specification ID is already used in the memory, a screen will appear stating “A specification with this ID is already in the database. Do you want to replace it?” Pressing “OK” or “Enter” will replace the specification.



When saving to “Factory” specifications, if the specification ID is already used in the database, the specification will be saved as an AMENDMENT to the factory specification already in memory.



For recalling User Specifications, refer to “Selecting User Specifications,” page 65.

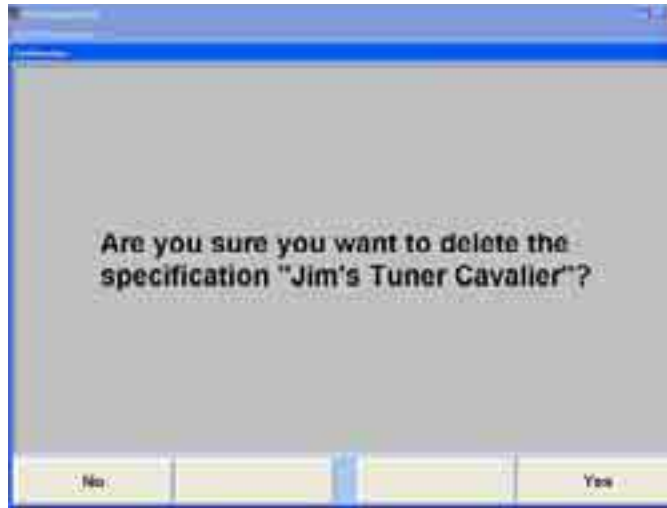
Storing Specifications - Deleting “User Specifications”

On the “Recall Specifications” screen:

Press  or  to select “Specification Database” and press “OK.” The screen will change to a list of possible screen sequences.

Press  or  to select “User” and press “OK.” The screen will change to list user entered specifications.

Press  or  to move the cursor to the desired item and press “Delete Specification.” The screen will ask for verification.



Press “Yes” or “No.”

Factory Amended Specifications

“Factory Amended Specifications” are specifications that are derived from and stored with a factory specification. The procedure for doing this is discussed in “Storing Specifications.”

Select “Show Spec Databases.” Then select “Factory Amendments.” This displays all vehicles that have a “Factory Amended Specification.”



The most likely use of a factory-amended specification is that the manufacturer has issued a Technical Service Bulletin that does one or more of the following:

- It alters the factory specification.
- It details a special service procedure.
- It warns of alignment problems.
- It warns of warranty procedures.

By having a “Factory Amended Specification” in the specification memory, these items are brought to your attention, as you recall the specifications. This way, you do not have to remember the Technical Service Bulletins.

On the “Recall Specification” popup screen, when there is an amended specification that is derived from the factory specification of the vehicle being aligned, highlight that specification and view its “Specification Note.” This note is intended to explain the use of this specification instead of the factory specification.

If there is a Technical Service Bulletin, store a “Factory Amended Specification” as detailed in “Storing Specifications.” The “Specification Note” should contain the contents of the Technical Service Bulletin.

WebSpecs.Net™ Online Specification Database

WebSpecs.Net™ is an on-line, Internet-based, alignment specification database designed to be accessed from any PC with an Internet connection. This includes any 611 Series Aligners equipped with an Internet connection. The specifications downloaded from WebSpecs can only be viewed and used on a 611 Series Aligner with WinAlign® 5.1 and above.

NOTE:	The WebSpecs feature is available in WinAlign® 5.1 and above, but the specs downloaded from a remote PC are only useable on versions of WinAlign® 6.1 and above.
--------------	--

WebSpecs combines a specification database with Hunter alignment adjustment illustrations and undercar parts inspection illustrations.

When used with WinAlign® 5.1 and above WebSpecs is available during the whole alignment process, not just when recalling specifications. Specifications retrieved from WebSpecs are saved to the hard drive where they can be retrieved later without an Internet connection. These specifications are recalled from the WinAlign® Specifications screen just like all the specifications loaded in the specification database.

When accessing WebSpecs in WinAlign® 5.1 and above, a web browser window will open framed by the WinAlign® screen.

The WebSpecs feature lets the user obtain specs directly from the constantly updated database at Hunter Engineering Company.

This combination produces a rapidly updated database to help the shop stay up-to-date providing access to the most current specifications and illustrations.

WebSpecs can be accessed from any PC with an Internet connection and Internet Explorer 5.5 and above. Use the address: <http://webspecs.net/> to logon to WebSpecs. The website will function the same as it does from an aligner console. When viewing online from a standard PC the screen will be the similar, but without the WinAlign® frame and functionality.

The Hunter Engineering website is accessible by selecting the “HunterUser.COM” softkey in the second level of softkeys on every WebSpecs screen further increasing the information available to the shop, or by selecting the Hunter Engineering Company logo at the bottom of the webpage.

WebSpecs Hardware and Software Requirements

WebSpecs Electronic Security Key (refer to User Authorization below).

The WebSpecs database requires a standard PC with floppy drive, or Hunter Aligner loaded with WinAlign® 6.1 and above software, a modem and Internet service provider (ISP), or any other Internet connection, and an email account.

Internet Explorer 5.5 Service Pack 2 or above is required.

To use the “Need A Spec” feature or to contact a rep in WebSpecs the aligner console must have an e-mail account set up.

WebSpecs User Authorization

The user will be required to obtain a one-year WebSpecs Access License. The License provides a user identification and password tied to an electronic key. This user name and key will only operate on one aligner, but the password can be used on any computer to access WebSpecs. At the end of the License expiration date, the WebSpecs feature will no longer be available, and the password will expire. See the local Hunter sales representative for upgrade and subscription rates.

Questions about subscriptions or service questions can be sent directly to service or sales personnel. Select the “Contact Hunter Service Rep” button on the WebSpecs homepage to list all sales and service reps in your local area. There will be full contact information and email links to send a message directly from WebSpecs.



WebSpecs Installation Instructions

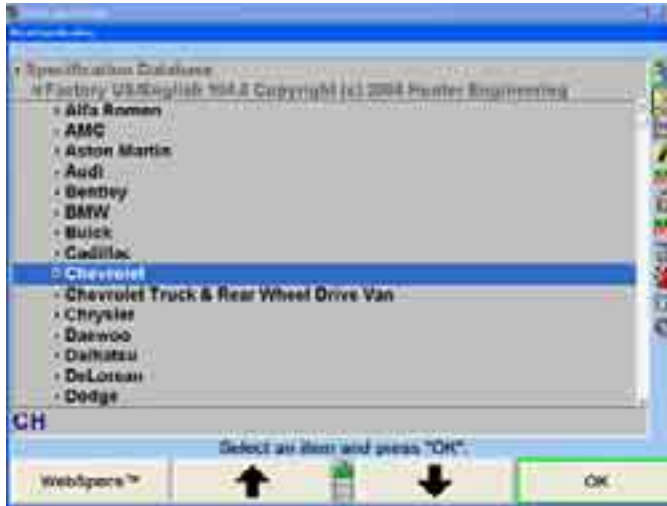
WebSpecs is a built-in feature of WinAlign® 5.1 and above. The Hunter Service Representative will install the modem (or a network card) and the electronic key into the Hunter aligner.

The shop is responsible for acquiring an Internet Service Provider and setting up an Internet browser on the aligner console or the PC that will access the WebSpecs website.

No special installation is required for use on a PC. WebSpecs does require the browser Internet Explorer 5.5 or higher.

Accessing WebSpecs.Net (Aligner Console)

Start WinAlign® and select “Begin Alignment.” In the Recall Specifications screen, determine whether the vehicle is already in the specification database. If the vehicle is not listed, select the “WebSpecs” softkey.



A screen will open, requesting a user name and password. Enter the user name and password provided with your WebSpecs electronic key. After entering the user name and password, the WebSpecs screen will open. The password can be saved and will no longer be requested.



The initial time the user name and password are entered specific user information must be logged for identification. This information can be updated at any time by selecting “Edit User Information” from the Manufacturer or Model selection screens. The WebSpecs username and password card should be kept in a safe and convenient place.

The WebSpecs Registration screen will open. Fill out the information and select “OK” on the WebSpecs screen, not the OK softkey. This screen will not need to be filled in again, and will not show unless it is to be edited.



Navigate the WebSpecs screens in WinAlign® by using the softkeys displayed below. “Back” returns to the previous screen, “Forward” goes to the next screen in sequence and “Home” returns to the WebSpecs Vehicle Manufacturer screen. “OK” returns to the WinAlign® program.



The “Print” and “Refresh” softkeys in the second level of softkeys will print or refresh the screen displayed. The “HunterUser.COM” softkey will take the user directly to the Hunter Engineering website.

Downloading Specifications

The WebSpecs On-Line Spec Recall screen will display all available vehicle manufacturers in the specification database. Click on the manufacturer to select.

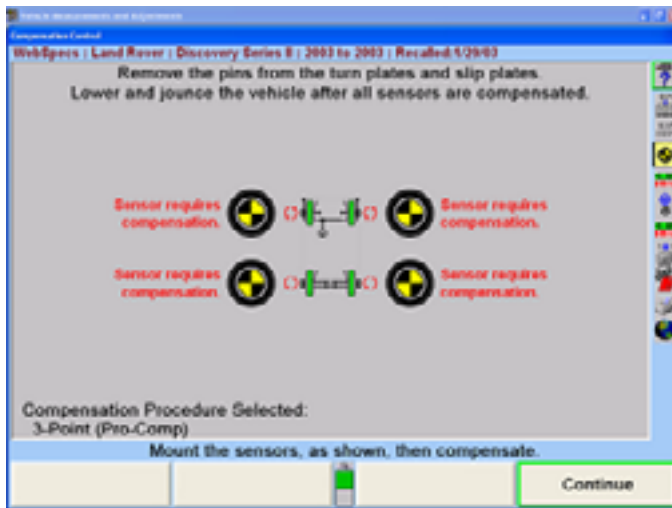


At the bottom of each manufacturer or vehicle screen are links to “LogOff” to end the WebSpecs session, “Edit User Information” screen to change or update user information, and “I need a spec that is not listed” to have the spec information directly emailed to the users shop. The user can go to the Hunter homepage by selecting the Hunter logo at the bottom of the screen.

Select a manufacturer. A list of vehicles by that manufacturer will appear.



If the “Recall” button is selected, the program will advance directly to the WinAlign® screen that is next in the procedure with the specs automatically loaded. Notice that the vehicle shown at the top of the screen identifies it as WebSpecs. Compensate the sensors and the car is ready for alignment.



Viewing Adjustment Illustrations in WebSpecs

Select “Images” button to view Adjustment Illustrations in diagram or photograph form.



This screen allows the user to view adjustment and inspection illustrations in photograph or diagram form. Each thumbnail can be selected to view the larger image. The image size can be adjusted using the “Zoom Out” and “Zoom In” buttons.

Parts Inspection

WebSpecs has incorporated the display of inspection illustrations. Select the button next to **Inspection Parts** in the upper left hand corner of the screen. The following screen will appear.



The screen offers the same zoom features as stated with the adjustment illustrations and adds the option of different text color choices for optimum visibility. Each part is marked with a square, and is labeled on the right side of the screen. The part can be highlighted by clicking on the part on the screen, or by selecting the label on the right side.

To view a different set of inspection parts, select a new image on the left side of the screen. Scroll down for more images.

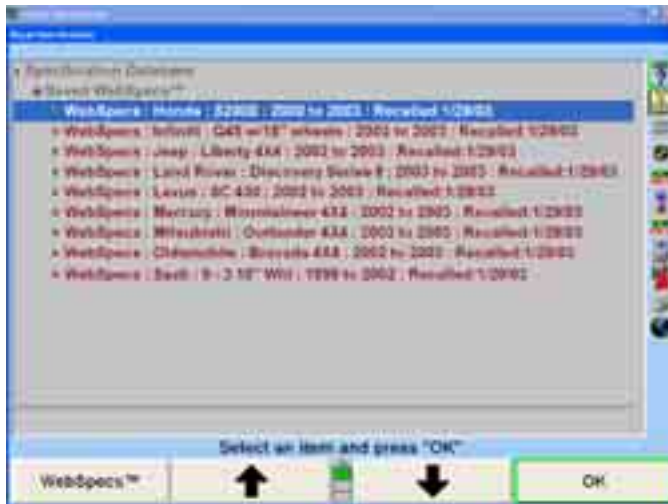
Printing WebSpecs Adjustment Illustrations

Select “Print” to print the illustration currently displayed on the screen and a screen will appear depicting the print image.



Recalling Saved WebSpecs

Each time a vehicle is selected in WebSpecs, the specifications are stored on the hard drive and can be recalled without using the Internet connection. To recall WebSpecs, select “Show Spec Databases” from the softkeys on the Recall Specifications screen. Select “Saved WebSpecs” from the screen display to view all saved WebSpecs listed alphabetically by manufacturer. Select the vehicle from the screen, and begin alignment.



Deleting Saved WebSpecs

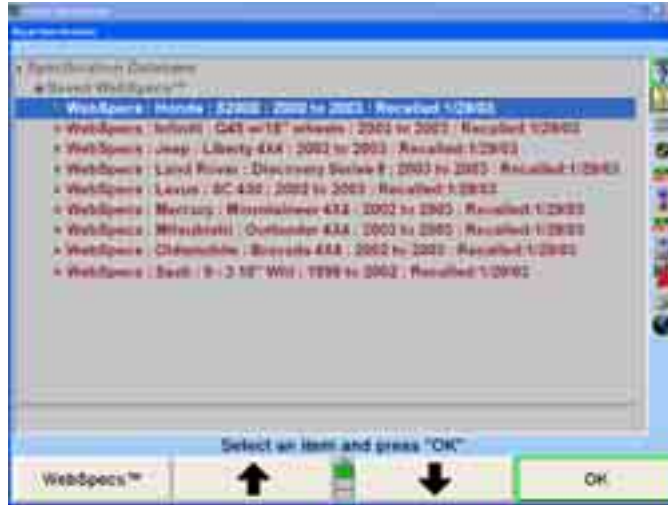
WebSpecs is limited to 50 maximum downloads. When the maximum has been reached WebSpecs will no longer save the downloaded WebSpecs. In order to save new WebSpecs it will be necessary to delete older downloaded specifications.

When you have exceeded the 50 maximum downloads the following message will automatically appear.

“The maximum number of WebSpecs has been stored on your computer. The WebSpec you just recalled will be available during the current alignment but will not be available for later recall from your hard drive. To make more space available for WebSpecs, press “Delete the ten oldest WebSpecs.”“

To remove the oldest WebSpecs select the “Delete the ten oldest WebSpecs” softkey. Selecting “OK” will load the WebSpecs into the alignment procedure, but will not store the WebSpecs for recall.

WebSpecs can also be deleted one at a time. From the Recall Specifications screen select Specification Database to show all specification databases. Select the Saved WebSpecs database to show all saved WebSpecs. Highlight the specification to be deleted (only one can be highlighted at a time).



Select “Delete Specification” from the softkeys to remove.

Using WebSpecs on remote PC's

Accessing WebSpecs from a remote PC does not take full advantage of WebSpecs' capability and is designed for aligners that are not connected to the aligner network. Specs can be downloaded to floppy disk, USB device, or directly to a file and then manually transferred to an aligner running WinAlign® software version 6.1 and above.

Access the Internet from any PC with an ISP and Internet Explorer 5.5. Navigate to <http://www.webspecs.net/>. The following screen will appear:



Enter the user name and password and select the “Logon” softkey.

All functions of the website are identical to the functions when used within the WinAlign® software program except that specs cannot be viewed. The “Recall” buttons have been replaced with floppy disk icons.

Selecting the “Images” will access the same vehicle adjustment and parts inspection illustrations available on the aligner console version of WebSpecs.

Downloading WebSpecs to Floppy Disk

If the floppy disk icon is selected the specs for that specific vehicle will be downloaded automatically to a floppy disk for installation on a 611/811 Series Aligner with WinAlign® 6.1 and above and a valid WebSpecs key. The following screen will appear:



The default download location is "A:\SpecNNNNNN.WebSpec" with "SpecNNNNNN.WebSpec" representing the specification name. Change the download location by single-clicking within the location to rename.



Type the specified drive and location. The example saves the spec to a WebSpecs folder created on the C: drive.



If downloading to a USB device, first install the device in a USB drive, then identify the drive letter using Windows® Explorer. Change the drive letter only and download the spec.

The first time the "Start Download" button is selected a security warning will display asking permission to install the "WebSpecs Specification Download applet." This applet must be installed before the download function will operate.



Select "Start Download." A download progress screen will appear.



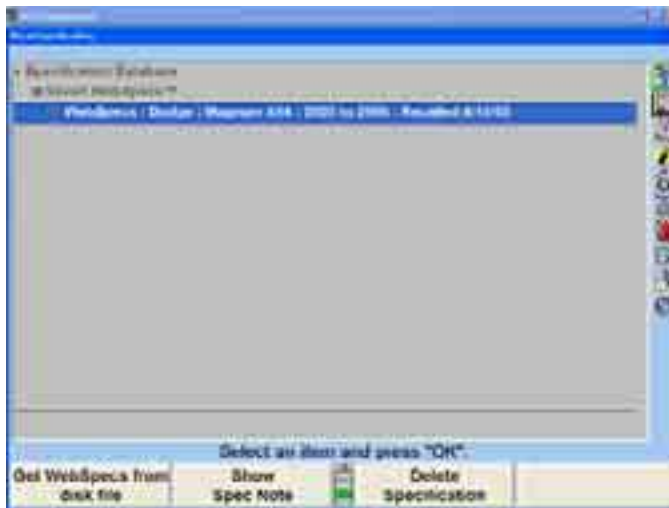
After download has completed the selected specs will be ready for installation on the aligner.

NOTE:	Downloaded specifications cannot be read or seen by any program other than WinAlign® software version 6.1 and above.
--------------	--

Specs for multiple vehicles can be downloaded to a single floppy disk. When uploading, all files will be stored in the "Saved WebSpecs" database.

Uploading WebSpecs

After downloading specs from a remote PC, the specs must be uploaded to the aligner. Insert the floppy disk into the aligner computer, and select "Get WebSpecs from disk file" softkey on the Recall Specs screen. The files will automatically be uploaded and displayed on the screen under "Saved WebSpecs." Choose the appropriate vehicle and proceed with the alignment as usual.



If downloading from a location other than the floppy drive (if present), select “Set WebSpecs Search Location.” Enter the correct drive and/or folder name and select “OK.”



Need A Spec

When selecting “I need a spec that is not listed” the Need A Spec screen will appear. The form will request a phone number and information about the vehicle in question. A note box below can be filled with notes about the vehicle, or special requests. Once the form is complete select the “Send Request” button. The request is automatically sent to Hunter Engineering using your e-mail account and a note will appear stating that the message has been sent.



Selecting Display Units

Do not underestimate the importance of selecting the display units. Although the ability to change display units can be beneficial, the factory specifications are displayed in the format designated by the manufacturer.

Press “Set Display Units” in the “Vehicle Specifications” primary screen. The “Alignment Measurement Units and Formats Setup” popup screen will appear listing “Current” and “New” settings.

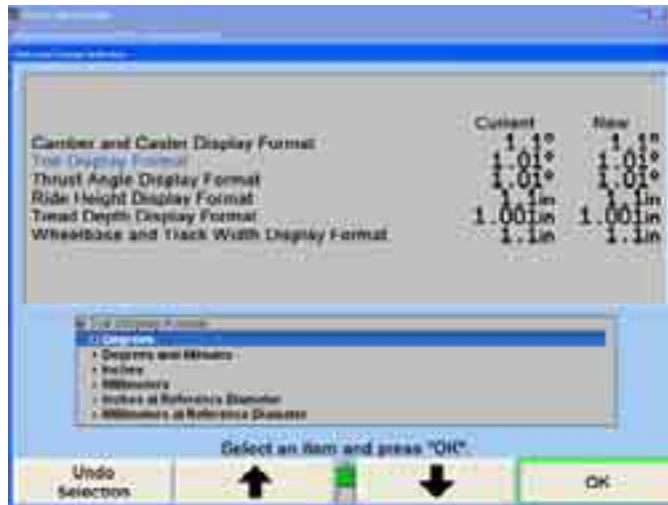
NOTE:	The “Alignment Measurement Units and Formats Setup” popup screen may also be accessed by selecting “Alignment Measurement Units and Formats” from “Aligner Setup.” <i>Refer to “Aligner Set Up,” page 173.</i>
--------------	---

Select and change the units and formats for the various alignment displays from the following popup screen. Both the “Current” and “New” settings are shown as example measurements.



Press or to highlight a display format type. When a parameter type is highlighted, a brief explanation of the measurement type appears.

Press “Set Up Selected Item.” The “Units and Format Selection” popup screen appears to allow the units and formats to be selected. This popup screen continues to show the current and new settings for all the display formats.



Press or to highlight the desired units, then press “OK.” The screen changes to show the formats available for the selected units for the display format.

Press or to highlight the desired units, then press “OK.” If the selected format is fractional, a third selection must be made, to select whether the fractions should be reduced. When the final choice is made, the popup screen closes and the display returns to the “Alignment Measurement Units and Formats Setup” popup screen. The new example for the display format shows the selection just made.

Press or to highlight another display format and continue to set up the units and formats.

If the change(s) should be applied only to the current vehicle, press “Apply New Settings.”

If the change(s) should be applied to the entire factory database each time the system is powered up, press “Set As Default.”

Press “Exit” to return to the “Vehicle Specifications” screen.

Printing Specifications

The vehicle specifications can be printed from the “Vehicle Specifications” primary screen and the “Vehicle Measurements and Adjustments” primary screen.

To print the vehicle specifications, press “Print” on the “Vehicle Specifications” primary screen or the “Vehicle Measurements and Adjustments” primary screen. The “Print” popup screen will appear.



If you wish, type in a note to appear on the printout. Press “Print Specifications” to print the vehicle specifications.

2.3 Vehicle Measurements and Adjustments

Vehicle Plan View Status Indicator

The purpose of the vehicle plan view status indicator is to illustrate:

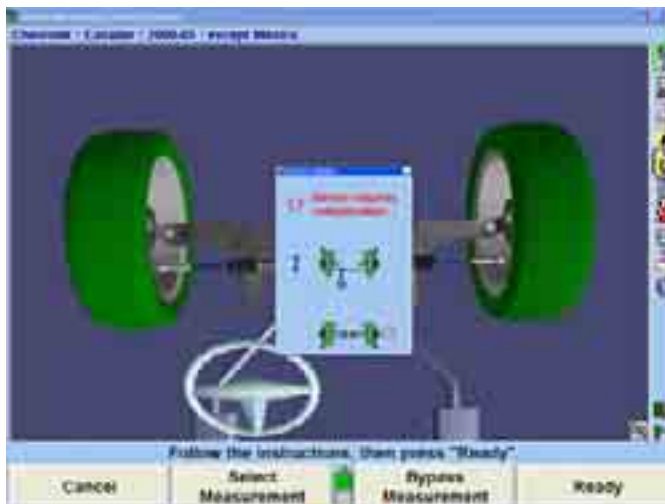
The geometry of the vehicle under alignment.

NOTE: This feature is more useful for truck applications because automobiles all show similar alignment geometry.

Where and how the sensors should be mounted.

Which axle of the vehicle is currently displayed.

The current status of the sensors, transducers, and sensor communications.



The indicator appears on the display when:

The primary or popup screen actively uses the sensors to measure or adjust the alignment.

An alignment procedure is being selected, where one or more instances of the plan view are used to illustrate the steps of the procedure.

During Virtual View and ExpressAlign® screens.

The indicator shows:

The vehicle geometry.

The currently required sensor mounting locations and orientations.

Which axle the measurements and adjustments currently apply.

Which axle is currently selected (which applies to jacking up the axle, etc.).


The individual wheels turn red when a sensor problem is present.

To change the displayed axle measurements, click on a wheel of the indicator with a pointing device, or press the softkey for “Show Next Axle.”

Target Blockage

The Plan View Sensor Status Indicator displays a live image of target status. If a target image is blocked the Plan View will display the following image indicating which target image is blocked.



Select “View Targets” to display a live video camera image of all four targets. The thumbtack image  in the upper left hand corner of the popup keeps the window visible.



Each target can be selected to zoom the image to identify viewing errors. Simple errors could be caused by a physical interference, or a dirty target, or possibly a target rotated out of viewing range.





















Sensor Troubleshooting

If a sensor has a problem, the “Sensor Status” popup screen will display, and an icon appears next to the affected sensor to indicate the problem. If the sensor has multiple problems, the icon representing the highest priority problem appears. Two icons may appear at times, thereby showing two separate problems.



The highest priority problem with the set of sensors is shown above the plan view, as both an icon and as text. The icon is duplicated next to the sensor or sensors that experience the problem.

Note that different sensors may experience different problems at the same time. For example, the left front sensor might require compensation while the right front sensor has a problem with a camber transducer. An icon meaning “the sensor requires compensation for runout” would appear next to the left front sensor, while an icon meaning “the sensor has a transducer problem” would appear next to the right front sensor. The compensation problem has a higher priority than a transducer problem, and so the icon and text above the plan view would show the same icon as the left front sensor along with the text “Sensor requires compensation.”

The icons that may be found next to the sensors in the sensor status popup screen, and the text that would appear with the icon above the plan view, are as follows:

-  “Sensor is not connected.”
-  “Sensor has communication problem.”
-  “Sensor is an unknown type.”
-  “Sensor has self-test error.”
-  “Sensor is mismatched with others.”
-  “Sensor is not calibrated.” (Cal-Check®)
-  “Sensor has calibration errors.”
-  “Sensor requires compensation.”
-  “Caster adjust transducer has problems.”
-  “Camber transducer has problems.”
-  “Transverse toe transducer has problems.”
-  “Longitudinal toe transducer has problems.”
-  “Sensor has excessive runout.”
-  “Turn encoder has miscounted.”
-  “Ride height encoder has miscounted.”
-  “Sensor is not level.” (Level Reminder®)
-  “Toe transducers may require re-calibration.”
-  “Battery requires recharging.”
-  (red) “Target not found.” Targets need to be cleaned.
-  (black) “Target is found by camera, but not measured.” Targets need to be cleaned.

The following icons can appear overlaying the line of sight from one sensor to another:

-  “Transverse toe beam is blocked.”
-  “Longitudinal toe beam is blocked.”

Spoiler Mode (Only applies to DSP508 or DSP508-XF Sensors)

If a spoiler, air dam, or ground effects below the front of the vehicle block the transverse toe beam, WinAlign can continue with the alignment using spoiler mode.

The “Start Spoiler Mode” message appears when the front or rear transverse toe beam is blocked.



Select the “Start Spoiler Mode” button on the screen to continue with the alignment procedure.

Once Spoiler Mode is activated, the Plan View grays-out the blocked toe transducers and removes the toe line between the sensors.

Showing Measurements

For “Geometric Centerline” the measurements for alignment, front camber, toe, and total toe will be shown.

For “Thrust Line” or “Total 4-Wheel” alignment, camber, toe, and total toe for the front will be displayed as well as rear camber, toe, total toe, and thrust angle.

NOTE:	These measurements should not be used to diagnose or adjust the vehicle until the vehicle is lowered, jounced, and the wheels are in a “straight ahead” position.
--------------	---

A red “X” next to the sensor having difficulty indicates a blocked optical path or other communication problem.

The “Cross Camber” and “Cross Caster” values represent the difference between the left and right measurements on the same axle.

The alignment measurements are displayed using the default unit of measure (degrees, inches, etc.) unless you have changed them.

Alignment measurements for CAMBER, CASTER, S.A.I., SET BACK, and THRUST ANGLE are generally displayed in degrees. TOE is generally displayed in either degrees or inches.

NOTE:	A negative sign (-) is used to indicate the following: A negative value for a specified angle or tolerance A SET BACK condition to the left (indicating the left front wheel is trailing the right front wheel). A THRUST ANGLE condition to the left (indicating a thrust line toward the left of centerline). Positive values for SET BACK and THRUST ANGLE indicate conditions to the right.
--------------	---

Pre-alignment measurements can be saved to be printed on the summary after the alignment is complete. This feature supplies the ability to compare the measurements before and after the alignment. Pressing “Save 'Before' Measurements” will store these measurements.

Bar Graph Adjustments


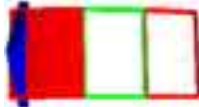

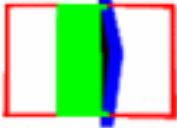

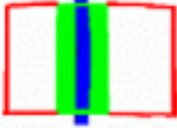

Bar graphs are used to show alignment angle information for each wheel. These bar graphs indicate the difference between the actual measurements of the vehicle and the recalled specifications. The adjustment tolerances determine the size of the center areas of the bar graph.

Softkeys labeled “Show Next Axle,” “Show Bar Graphs,” and “Show Next Bar Graphs” are available to access adjustment displays. The system utilizes both bar graph and digital adjustment displays.

The numerical values below the bar graphs represent the actual measurement. The “ideal” or “preferred” adjustment would find the wheel position indicator arrow centered over the white line of the center bar and the numeric value reading the preferred specification for the vehicle.

A red bar graph indicates the measurement is out of tolerance. On standard bar graphs, an “X” indicates the measurement direction on the bar graph is beyond the range of the bar graph. The “X” will change to an arrow when the measurement is adjusted into range of the bar graph.

As the vehicle is adjusted, the wheel position indicator moves in the direction of the adjustment. As the adjustment approaches the acceptable tolerance range, the center area of the bar graph grows. When the adjustment is within tolerance, the bar graph changes to green.

Range	Virtual View 3-D Bar Graphs	Standard Bar Graphs
Out Of Tolerance (beyond range of the graph)		
Out Of Tolerance		
Acceptable Adjustment (within tolerance)		
Preferred Adjustment		

If no 3-D bar graph is shown in Virtual View or the standard bar graph color is gray:

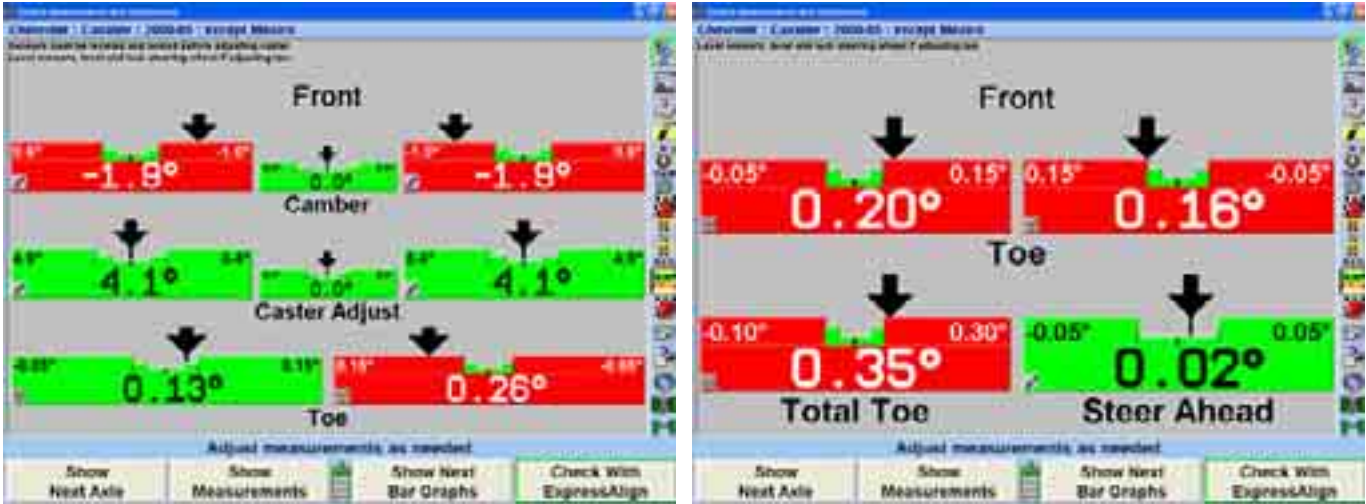
Either “no specification,” a “zero tolerance,” or “no tolerance” is entered for that angle.

OR

The sensors are experiencing some problem that prevents measurements, such as: the sensor is unplugged, uncompensated, or the toe beam is blocked.

Bar Graph Groups

The bar graphs can be viewed in various groups. Three examples are shown below.



To view an alternative group or single bar graph, press “Show Next Bar Graphs.” Repeat to view the next bar graph group. When all enabled bar graphs have been viewed, the first enabled bar group will appear when “Show Next Bar Graphs” is pressed.

To view a single bar graph select the desired bar graph with a light pen or mouse. The system will “zoom in” on the selected bar graph and all other bar graphs will be removed from the screen.

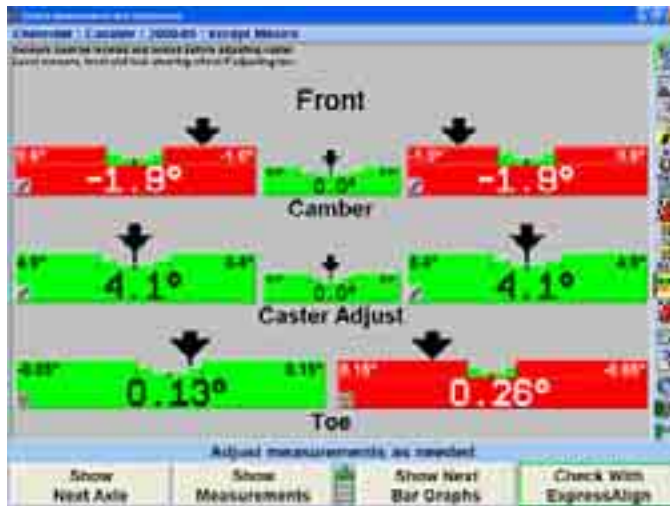


To return to the previous bar graph display, click on the current bar graph.

In Virtual View select any bar graph with the mouse and it will also zoom in for a larger display.



Like the “Vehicle Measurements and Adjustments” screen, cross camber and caster can now be displayed on the adjustment bar graph screen using the context sensitive menu.



Front Axle Bar Graphs Groups, Rear Axle Bar Graphs Groups, and Cross Bar Graph/Additional Cross Angles may be setup in aligner setup.

Context Sensitive Menu

A context sensitive menu is available on the bar graph adjustment screen.

To view the menu, move the arrow cursor to the desired bar graph with a light pen or mouse, then press and hold. Pressing the “Tab” key will also cycle through each context sensitive menu.

The items listed in the menu will depend upon which bar graph is selected. The menu may contain some of the following items:

Zoom In

Illustrate Adjustments

Animation Adjustments

Adjust with Shims

Measure Caster

Set Units and Formats

Show Specs

Show Cross Bar Graphs and Additional Cross Angles

Zoom Out

Video Adjustments

Adjust with Eccentric Cams

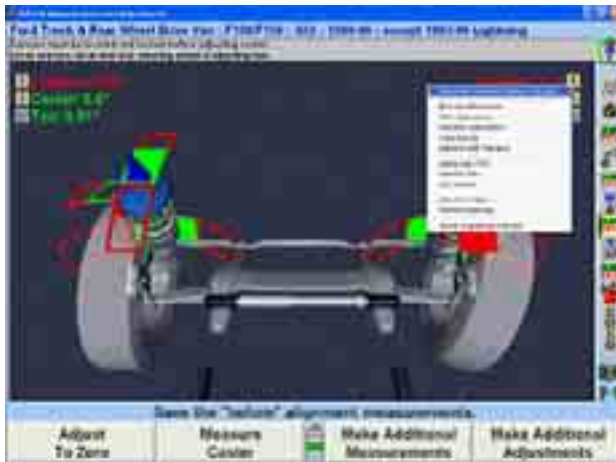
Adjust Toe with WINTOE®

Measure SAI/IA

Select Bar Graph Groups

Hide Specs

Adjust With Automatic Bushing Calculator®



To select the desired item, continue moving the cursor until the desired item is highlighted. Click on the highlighted item and the selected popup screen will appear.

Context sensitive menus are also available on power feature adjustment bar graphs.



Automatic Bushing Calculator



CAMM-Control Arm Movement Monitor

Zero Adjustments

The “Zero Adjust” screen shows the amount and direction (\pm) the actual measurement is from the preferred specification. Adjusting an angle to zero on this display will cause the actual angle measurement to be exactly equal to the preferred specifications as established by the alignment specifications.



A red bar graph indicates the adjustment is out of tolerance. Green indicates the adjustment is within tolerance. The number “0” indicates the measured angle equals the specification.

Showing and Selecting Front and Rear Axles

The front and rear axle measurements can be viewed at any time from the “Vehicle Measurements and Adjustments” primary screen.

When the measurements for the rear axle are shown, press “Show Next Axle” to see the front axle measurements.

When the measurements for the front axle are shown, press “Show Next Axle” to see the rear axle measurements.

Adjusting With Axles Raised

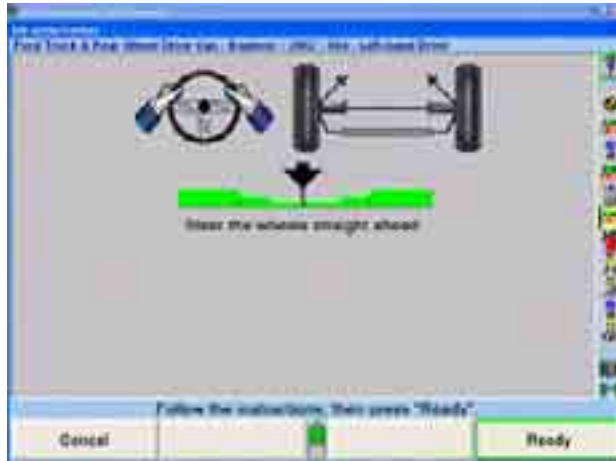
A vehicle may require that the wheels be raised to make an adjustment to rear or front camber and caster. When the wheels are raised, the sensors will move and the angles will change. If the instructions are followed, the software compensates for the movement of the sensors to allow accurate adjustment.

NOTE:	This procedure is not useful for installing shims, wedges, etc. when the adjustment requires the removal of the sensor and wheel assembly.
-------	--

To adjust vehicle with axle raised:

Press “Jack Up Selected Axle” on the “Vehicle Measurements and Adjustments” primary screen.

If the wheels are not steered straight the following screen will appear. Steer straight ahead and the screen will automatically go to the “Axle Jacking Procedure” screen.



The “Axle Jacking Procedure” popup screen will appear.



After the selected axle is raised, press “Ready.” The program will compensate for the difference in sensor readings caused by raising the wheels and return to the “Vehicle Measurements and Adjustments” primary screen.

Make the necessary adjustments while observing the bar graphs. Press “Lower Selected Axle” on the “Vehicle Measurements and Adjustments” primary screen. The “Axle Jacking Procedures” popup screen will appear.



Lower the vehicle and then jounce.

Press “Ready.” The screen will return to the “Vehicle Measurements and Adjustments” primary screen.

Adjusting with Axles Raised Using Jack Detect™ Feature

The Jack Detect™ feature automatically senses when an individual axle is being raised or lowered. This feature requires DSP600 series sensors.

Unlike standard axle jacking procedures, no softkeys need to be selected. An axle can be jacked up during the alignment procedure and WinAlign® will “see” that an axle is being raised and will proceed directly to the Axle Jacking Procedure screen. Press “Ready” to proceed with vehicle adjustments.



If the vehicle needs to be raised or lowered, the aligner will sense this change. The program detects when the vehicle is lowered to rack height and will again proceed to the Axle Jacking Procedure screen. Press “Ready” to return to the alignment procedure.



Wheel-Off Adjust Feature

Using the optional wheel-off adaptor adjustments may be made with wheel and tire assembly obstructions.

The wheel-off adaptor kit, 20-1978-1, can be installed using the vehicle's lug nuts or using the additional magnet assembly kit, 20-1979-1.

Accessing “Adjust with Wheel Off” Procedure within WinAlign

With DSP600 Series Sensors, WinAlign's JackDetect™ feature senses when an individual axle is being raised. Raise the axle and the “Axle Jacking Procedure” screen will appear.

With DSP500 Series Sensors, initiate the axle jacking procedure by pressing “Jack Up Selected Axle” on the “Vehicle Measurements and Adjustments” screen. The “Axle Jacking Procedure” screen will appear.



Follow the on-screen instructions to raise the axle and then press “Adjust With Wheel Off.”



Refer to following page for detailed explanation of the on-screen instructions regarding Wheel-Off Adaptor installation. After completing the on-screen instructions, press “Ready.”

Wheel-Off Adaptor Installation

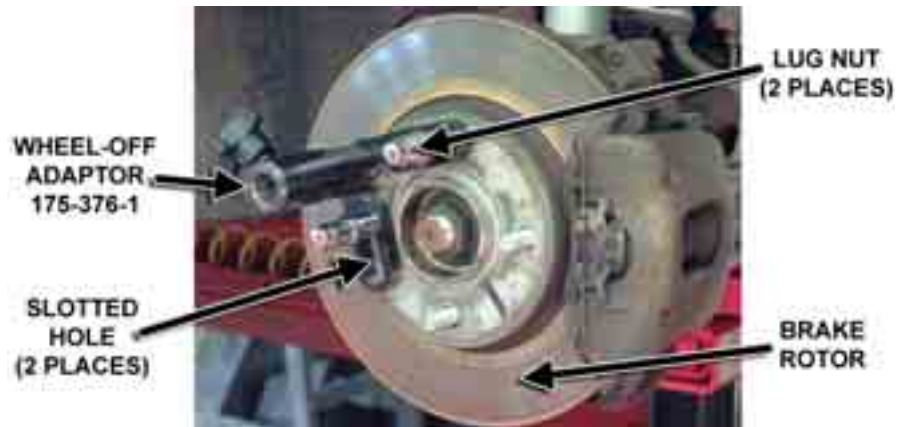
Lock the brakes with the brake pedal depressor.

NOTE: Install a wheel-off adaptor and target (or sensor) to one or both wheels of the raised axle, depending on alignment adjustments required.

With the front or rear axle raised and supported, remove the target (or conventional sensor), wheel adaptor and wheel.

Standard Bolt-on Wheel-Off Adaptor Installation

Place a Wheel-Off Adaptor, 175-376-1, onto the brake rotor hub or brake drum with a stud through each of the two slotted holes.



Secure the Wheel-Off Adaptor with two lug nuts.

⚠ CAUTION: Do not allow the Wheel-Off Adaptor to slip on the rotor or drum. Once the target (or sensor) is installed, runout compensation and alignment accuracy will be adversely affected if the Wheel-Off Adaptor is allowed to slip.

Test the security of the installation by lightly tugging on the Wheel-Off Adaptor.

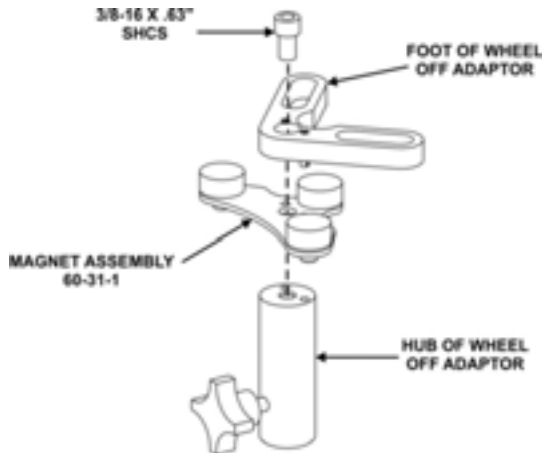
Wheel-Off Adaptor Installation Using the Optional Magnet Assembly Kit, 20-1979-1

⚠ CAUTION: Keep magnet assembly away from computers, CRT monitors, magnetic storage media, pacemakers, watches, and other objects that can be damaged by magnetic fields.

Remove the 3/8-16 X .63" socket head cap screw securing the foot to the hub.

Remove the hub and set aside.

Place the magnet assembly, 60-31-1, on the foot, aligning the two smaller holes to the split pins.



Place the previously removed hub onto the assembled magnet assembly and foot, aligning the two smaller holes to the split pins.

Re-install the 3/8-16 X .63" socket head cap screw, securing the magnet assembly and foot to the hub.

Repeat magnet installation to second Wheel-Off Adaptor.

Lock the brakes with the brake pedal depressor.

NOTE:	Install a wheel-off adaptor and target (or sensor) to one or both wheels of the raised axle, depending on alignment adjustments required.
--------------	---

With the front or rear axle raised and supported, remove the target (or conventional sensor), wheel adaptor and wheel.

Secure the brake rotor to the hub with at least two lug nuts.

⚠ CAUTION:	The strong magnets snapping to a steel surface may create a possible pinch hazard.
-------------------	--

Place the Wheel-Off Adaptor onto the pad surface of the brake rotor.



⚠ CAUTION:	Do not allow the Wheel-Off Adaptor to slip on the rotor or drum. Once the target (or sensor) is installed, runout compensation and alignment accuracy will be adversely affected if the Wheel-Off Adaptor is allowed to slip.
-------------------	---

Test the security of the installation by lightly tugging on the Wheel-Off Adaptor.

Re-Install the Sensor or Target

Re-install the target (or sensor) to the Wheel-Off Adaptor.



Level and lock the re-installed target (or sensor).

If both sides of the axle require camber and/or caster adjustments, repeat the above instructions on the opposite side of axle.

After the selected axle is raised, press “Ready.” The program will compensate for the difference in sensor readings caused by raising the wheels and return to the “Vehicle Measurements and Adjustments” screen.

Make the necessary adjustments while observing the bar graphs.

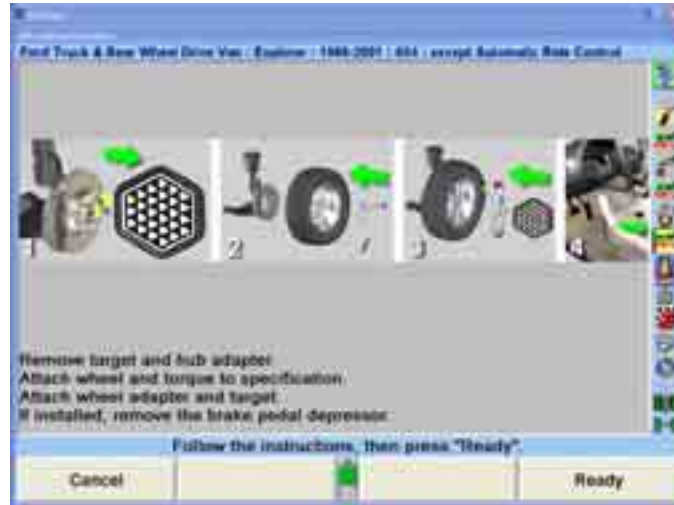
⚠ CAUTION: Do NOT adjust toe with the axle raised. Notice the “Axle jacked up” reminder at the top of the screen.



WinAlign detects the removal of the target (or sensor) from the raised axle and automatically starts the axle lowering procedure. Remove the target (or sensor) and the “Axle Jacking Procedure” screen will appear.

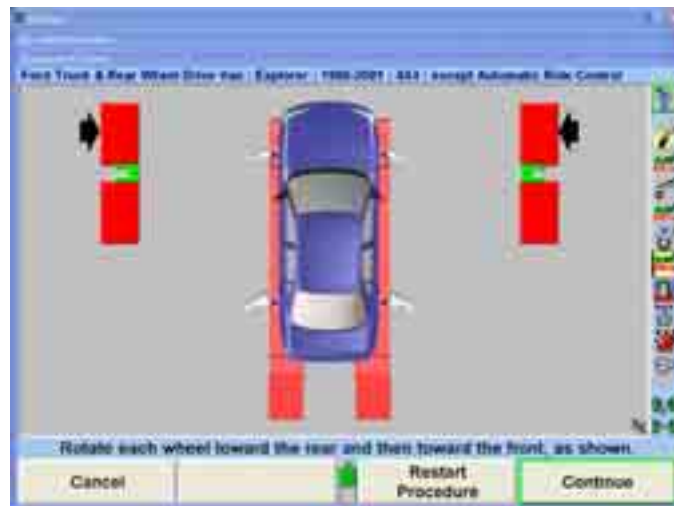
OR

Initiate the axle jacking procedure by pressing “Lower Selected Axle” on the “Vehicle Measurements and Adjustments” screen. The “Axle Jacking Procedure” screen will appear.



Follow the on-screen instruction to remove the target (or sensor) and Wheel-Off Adaptors and then re-install the wheels, wheel adaptors, and target (or sensor). Press “Ready.”

The “Compensation Control” screen will appear.



Follow on-screen instruction to compensate the re-installed targets (or sensors) and then press “Continue.”



Follow on-screen instruction to lower the axle and then press “Ready.”

The screen will return to the “Vehicle Measurements and Adjustments” screen.

NOTE: Notice that the “Axle jacked up” note is no longer at the top of the screen.

Make the necessary additional alignment adjustments while observing the bar graphs on the “Vehicle Measurements and Adjustments” screen.

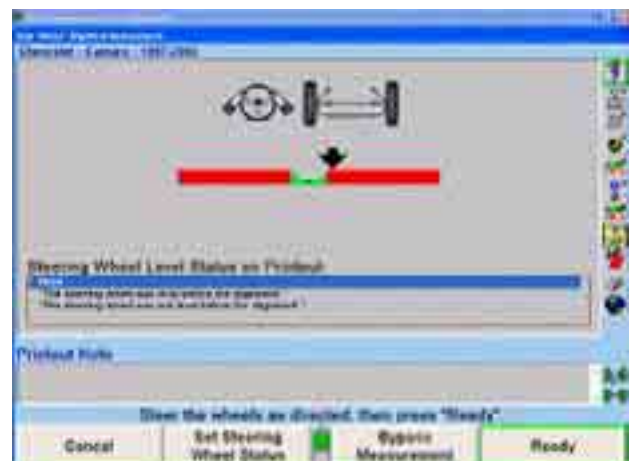
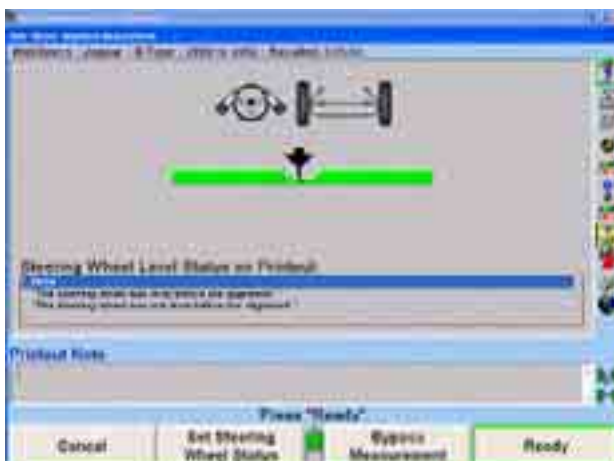
Saving “Before” Measurements

To include the before adjustment measurements on the summary printout or to see what they were, the measurements must be saved.

Perform caster steer as described in “Measuring Caster.” When the procedure is complete, the screen will return to the “Vehicle Measurements and Adjustments” primary screen.

Press “Save ‘Before’ Measurements.” The “Save ‘Before’ Alignment Measurements” popup screen will appear.

Steer the wheels straight ahead as indicated by the bar graph on the screen.



For printouts, highlight the steering wheel level status. This message will be displayed on printouts.

Press “Ready.” The program will save the before measurements and the screen will return to the “Vehicle Measurements and Adjustments” primary screen.

To save current measurements as before measurements, refer to “Saving Current Measurements as ‘Before’ Measurements,” page 152.

Control Saved Measurements

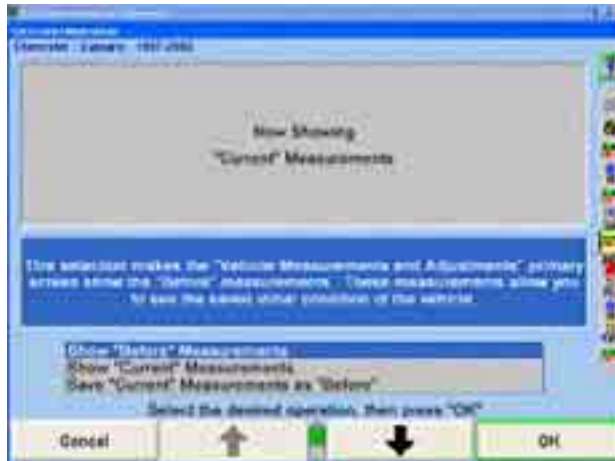
Measurements can be viewed in the current adjustment mode, or when they were initially saved.

Showing “Current” Measurements

To display the current measurements of the vehicle:

Press “Control Saved Measurements” on the “Vehicle Measurements and Adjustments” primary screen. The “Control Saved Measurements” popup screen will appear.

Press  or  to highlight “Show ‘Current’ Measurements.”



Press “OK.” The “Vehicle Measurements and Adjustments” primary screen will appear. The bar graphs will display the current measurements.

Showing “Before” Measurements

To see what the before adjustment measurements were:

NOTE: If the “before” measurements are not saved, the bar graphs will become gray.

Press “Control Saved Measurements” on the “Vehicle Measurements and Adjustments” primary screen. The “Control Saved Measurements” popup screen will appear.

Press  or  to highlight “Show ‘Before’ Measurements.”



Press “OK.” The “Vehicle Measurements and Adjustments” primary screen will appear.

The bar graphs will revert to the before measurements. The screen will indicate this with a yellow bar across the top. When the before measurements are on the screen adjustments cannot be made.

Saving “Current” Measurements as “Before” Measurements

To replace the before measurements with the current measurements:

Press “Control Saved Measurements” on the “Vehicle Measurements and Adjustments” primary screen. The “Control Saved Measurements” popup screen will appear.

Press  or  to highlight “Save ‘Current’ Measurements as ‘Before’.”

Press “OK.” The “Save ‘Before’ Alignment Measurements” popup screen will appear.

Steer the wheels straight ahead as indicated by the bar graph on the screen.

Press “Ready.” The program will save the before measurements and the screen will return to the “Vehicle Measurements and Adjustments” primary screen.

ExpressAlign® Alignment Adjustment System

ExpressAlign® is a feature that analyzes an alignment job and directs the technician through the alignment and adjustment procedures needed for a specific vehicle. ExpressAlign® reduces the alignment procedures to the minimum number of steps required to completely align the vehicle.

ExpressAlign® considers the following for each specified vehicle aligned:

The alignment adjustments that are necessary.

The alignment sequence and specifications for the adjustment(s).

The power tools that are applicable, (such as shims, WINTOE®, CAMM®).

The applicable adjustment illustrations and videos.

Then ExpressAlign® creates a custom alignment procedure that allows the technician to perform only the procedures needed for the selected vehicle.

NOTE:

ExpressAlign® may display bar graphs and prompt to adjust an angle that is out of specification that is non-adjustable according to the vehicle manufacturer. ExpressAlign® displays these bar graphs to indicate a possible problem within the suspension or steering components that needs to be diagnosed and repaired for proper alignment. This is why the manufacturer publishes a specification for that angle, even if it is not adjustable. There may also be an aftermarket kit available to make the necessary adjustment for this angle.

Three levels of ExpressAlign® can be selected from the ExpressAlign® Setup, or a custom setup can be chosen.

Level I is designed to provide the technician with the maximum amount of help and support to complete the alignment.



Level II is designed to present the optimal alignment procedure while still showing the user what tools and kits are necessary to complete the job.



Level III provides the optimal alignment procedure for the experienced technician.



Items may be selected individually for a custom ExpressAlign® setup.

The items available include:

- Use WINTOE® if appropriate for Vehicle
- Use CAMM® procedure if appropriate for Vehicle
- Use Front Bushings if appropriate for Vehicle
- Use Rear Shims if appropriate for Vehicle
- Show Tools and Kits
- Show Adjustment Illustrations
- Show Adjustment Videos
- Adjust to Half Tolerances

ExpressAlign® can be setup from “Aligner Setup,” or while ExpressAlign® is running, it can be setup by selecting “Setup ExpressAlign” softkey.

ExpressAlign® cannot be disabled while using “ExpressAlign” to perform an alignment job. ExpressAlign® can only be disabled from “Aligner Setup.”

After the vehicle is selected, inspected, sensors mounted and compensated, caster is measured, but before measurements are saved, the “ExpressAlign®” popup screen will be displayed as shown below.



NOTE: The actual procedures displayed will vary depending on the vehicle and procedures that are enabled or disabled in “Setup ExpressAlign.”

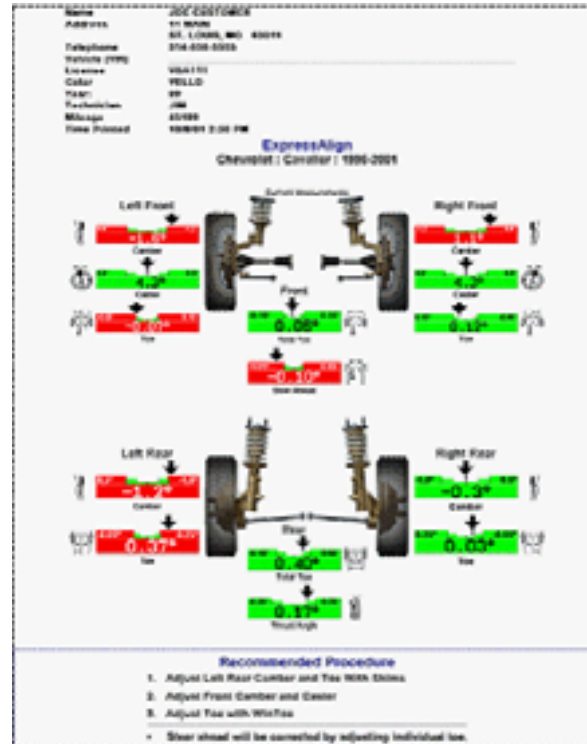
On the ExpressAlign® screen, press the icon on the procedure bar that corresponds to the step to be completed. During the procedure, continue to press the next icon on the procedure bar in order to progress through the procedure. As you go through the procedure, the current step will be highlighted on the procedure bar.

An icon will be displayed in the “ExpressAlign®” popup screen for each suggested procedure.

The procedure created by ExpressAlign® will be displayed in the vertical procedure bar on the right side of the screen.

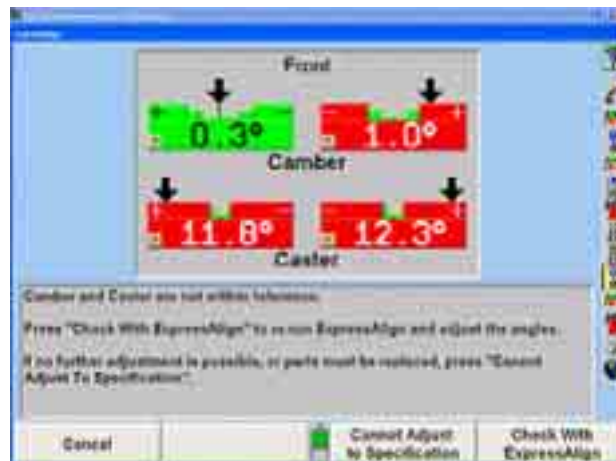
Procedures displayed with yellow text in the “ExpressAlign®” popup screen refer to adjustments that **must** be made for the specified vehicle. Procedures displayed with black text are for measurement verification or to provide assistance during the alignment.

Selecting “Print Analysis” from the softkey panel of the “ExpressAlign[®]” popup screen will print all measured angles with the recommended procedures required to adjust the angles.



Selecting “Use Half Tolerance” from the softkey panel of the “ExpressAlign[®]” popup screen will reduce the specification tolerance to half of the original equipment manufacturer’s recommended tolerance.

If one side of the vehicle is within specification, ExpressAlign[®] will allow the side that is out of specifications to be adjusted with the “One-Sided Adjustments” procedure. If you complete the alignment and an angle has not been adjusted to within specifications, ExpressAlign[®] will allow you to select “Cancel,” “Cannot Adjust to Specifications” or “Check With ExpressAlign.”



Selecting “Cancel” will return you to the “Vehicle Measurements and Adjustments” primary screen.

Selecting “Cannot Adjust to Specification” will allow you to proceed with the angle not adjusted in ExpressAlign[®].

Selecting “Check With ExpressAlign” will create a new ExpressAlign[®] procedure and return you to the “ExpressAlign[®]” popup screen.

2.4 Alignment Procedure

Although the program begins a specific type of alignment, other types of alignment can be selected on the “Control Alignment Procedure” popup screen.

The aligner can be set to default to the type of alignment that will usually be performed. Some vehicle manufacturers recommend a particular type of alignment. This information is part of the stored factory vehicle specifications and will change the aligner to the recommended alignment type when the specifications are recalled, regardless of the default selection.

Adjustment Order

The vehicle should be adjusted in the following order:

- Rear Camber (if adjustable)
- Rear Toe (if adjustable)
- Front Camber/Caster (if adjustable)
- Front Toe

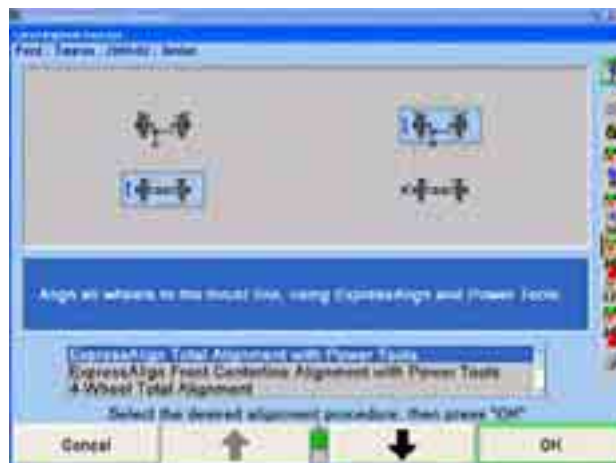
NOTE: If a sensor is removed from the during vehicle adjustment, that sensor must be re-compensated when it is re-mounted.



If a measurement displays in gray with no value shown and an error message is on the vehicle graphic, something is wrong with the sensor at the wheel indicated. The sensor may be disconnected, or an optical “line of sight” to another sensor may be blocked. When the error is corrected, the error message will disappear and the bar graph will return to normal. *Refer to “Sensor Troubleshooting.”*

Selecting the Procedure

Press “Alignment Procedure,” the “Control Alignment Procedure” popup screen will appear.

NOTE: The “Control Alignment Procedure” popup screen may also be accessed by selecting “Alignment Procedure” from “Aligner Setup.” *Refer to “Aligner Set Up.”*



Press  or  until the desired alignment procedure is highlighted. The steps required are illustrated when a procedure is highlighted. *Refer to “Alignment Types.”*

Press “OK.”

NOTE: The steps required to perform an alignment procedure may not be exactly the same as the “Getting Started” example. Follow the screen prompts to perform any type of alignment.

DSP400/600 Alignment Reference

DSP400/600 Alignment Reference can be used only with DSP400/600 sensors and can be set up only after DSP400/600 sensors have been selected as the default sensor type. To select sensor type, refer to “Aligner Set Up,” page 173.

This feature allows the alignment technician to select between using a plane parallel to the runways to determine wheel alignment angles (Runway Reference Plane) or using reference planes defined by the current “live” positions of the wheels (Live Reference Plane).

Using “Runway Reference Plane” to determine wheel alignment angles is identical to conventional sensors.

Using “Live Reference Plane” to determine wheel alignment angles allows warped or “non-flat” runways to be used.

The manufacturer’s alignment specifications are determined using runway planes (Runway Reference Plane).

To select “Runway Reference Plane” or “Live Reference Plane,” refer to “Aligner Set Up,” page 173.

Controlling Sensor Compensation

The sensors can be compensated by the 2-Point method or the 3-Point method. This is controlled by WinAlign. To select the compensation method:

Press “Mount Sensors” on the “Vehicle Inspection” primary screen or “Control Compensation” on the “Vehicle Measurements and Adjustments” primary screen. The screen will change to the “Compensation Control” popup screen.

Press “Use 3-Point Procedure” or “Use 2-Point Procedure.”

Press “Set As Default” to have the selected procedure become the default.

Press “Revert To Default” if the selection was temporary and the alignment procedure for that method has been completed.

Measuring Caster, S.A.I., and Included Angle

The “Measure Caster” display provides guidance through the procedure to measure Caster or Steering Axis Inclination (S.A.I.) and Included Angle (I.A.). At times, measuring S.A.I., I.A. or turning angle may be useful “tools” to help determine front suspension or steering system problems with a vehicle.



Horizontal bar graphs are used to indicate wheel position or angle position in relation to the preferred position or specification. The center of each bar graph represents the preferred position of the wheel(s) or angle.

The Caster measurement display uses graphics and horizontal bar graphs to guide the steering of the wheels through the caster turn.

A wheel position indicator (either an “X” or an arrow) is positioned within the bar graph and shows the position of the wheel(s). The wheel position indicator will be left of center if the front wheels are steered too far to the left, right of center if the front wheels are too far to the right, or in the center valley of the bar graph if the front wheels are steered correctly (null position).

An “X” on a red bar graph indicates the wheels are steered beyond the range of measurement. Steer the wheels in the direction necessary to move the “X” toward the center of the bar graph. The “X” will change to an arrow when the wheel comes into range of the bar graph.

NOTE: Total toe conditions greater than 2 inches or 4 degrees should be corrected prior to steering caster.

As the wheels are steered in the proper direction, the arrow will move toward the center. As the wheel approaches the acceptable tolerance, the center area will get larger. When the wheel is within tolerance, the bar graph will change to green.

Steered out of range (right)



Steered too far (right)



Steered correctly (null position)



When the wheel is in the proper position, the arrow will be over the thinnest section of the bar graph. The aligner will save the measurements and the bar graph will disappear.

NOTE: It is not necessary to perfectly center the arrow in the bar graph when steering to measure caster, caster and S.A.I./I.A., or S.A.I./I.A. The wheel position is acceptable when the arrow is positioned within the center valley of the bar graph.

NOTE: If WinAlign® determines that the brakes are applied or sensors are unlocked while measuring S.A.I., a prompt will appear asking you to check the sensors and/or brakes.

NOTE: DSP400/600 Sensor Only:
Unlike conventional sensors, DSP400/600 Targets should not be unlocked and re-leveled if the target has rotated so that it is not level after measuring caster.
If the DSP400/600 Sensor targets have rotated so that they are not level after measuring caster but before adjusting caster, “Match Caster Adjust to Measured Caster” may be selected from the caster pull-down bar graph. This will allow WinAlign to electronically compensate for rotation.

Measuring Caster

Press “Measure Caster” on the “Vehicle Measurements and Adjustments” primary screen. The “Caster and S.A.I. Measurement” popup screen will appear.

If “Caster Only” is not the default:

Press “Select Measurement,” the “Caster Measurement Selection” popup screen will appear.



Press  or  until “Caster Only” is highlighted.

Press “OK” to select the measurement. The “Caster and S.A.I. Measurement” popup screen will appear.

NOTE: This selection will not change the aligner default setting. When the aligner is reset, the default settings will be applied.

Lower vehicle if raised and remove brake pedal depressor if installed.

Loosen the front sensor lock knobs.

A single bar graph is displayed along with a prompt to steer the wheels to the straight-ahead position.

Steer the wheels until the wheel position indicator is within the center valley of the bar graph and hold steady. The aligner will save the measurements and the display will change to show two bar graphs and prompt to steer left. Depending on conditions, you may be required to press “Ready” to continue.



The left bar graph indicator is controlled by the left wheel, the right bar graph indicator by the right wheel.

Observing the bar graph display, steer the wheels to the left until either wheel position indicator is within the center valley of its bar graph. Hold the steering wheel steady.

The measurements will be saved and the bar graph will disappear.

Continue to steer the wheels until the remaining wheel position indicator is within the center valley of its bar graph. Hold the steering wheel steady until that bar graph disappears.

Two new bar graphs will appear and the steering wheel display will indicate to steer to the right.



Observing the bar graph or virtual view display, steer the wheels to the right until either wheel position indicator is within the center valley of its bar graph. Hold the steering wheel steady.

The measurements will be saved and that bar graph will disappear.

Continue to steer the wheels as indicated until the remaining wheel position indicator is within the center valley of its bar graph. Hold the steering wheel steady until that bar graph disappears.

A single bar graph will appear.

Steer the wheels straight ahead until wheel position indicator is within the center valley of the bar graph. Install the brake pedal depressor and level and lock the sensors.



Press “Ready” and the “Vehicle Measurements and Adjustments” primary screen will reappear.

These are the initial measurements of the vehicle. Press “Save ‘Before’ Measurements” to save them for the printout. If “Set steering wheel status when measurements are saved” is enabled from “Aligner Setup,” the screen will change to the “Save ‘Before’ Alignment Measurements” popup screen. *Refer to “Aligner Set Up,” page 173.*



If “Set steering wheel status when measurements are saved” is disabled from “Aligner Setup,” and all measurements are stable, and the vehicle is steered straight ahead, then the “Save ‘Before’ Alignment Measurements” popup screen will be continued through. The screen will briefly appear and the settings will be automatically saved if everything is stable.

Make sure the vehicle is in the correct condition to save the “Before” measurements. Jounce the vehicle, then steer the wheels straight ahead until the bar graph indicates a null position.

For printouts, highlight the steering wheel level status. This message will be displayed on printouts. In ExpressAlign® it is necessary to steer ahead prior to saving the current status.

Press “Ready.” When the measurements are stable, the program will save them for ExpressAlign®, Work Management printout.



The system will save the measurements and the screen will return to the “Vehicle Measurements and Adjustments” primary screen if ExpressAlign® is not enabled.

Measuring S.A.I. and Included Angle

Press “Measure Caster” on the “Vehicle Measurements and Adjustments” primary screen. The “Caster and S.A.I. Measurement” popup screen will appear.

If measuring “S.A.I./I.A. Only” is not the default:

Press “Select Measurement,” the “Caster Measurement Selection” popup screen will appear.

Press  or  until "S.A.I./I.A. Only" is highlighted.



Press "OK" to select the measurement. The "Caster and S.A.I. Measurement" popup screen will appear.

NOTE:	This selection will not change the aligner default setting. When the aligner is reset the default settings will be applied.
--------------	---

Lock the front brakes using a brake pedal depressor.

Steer the wheels straight ahead.

Jack up the front axle until the front wheels clear the turning angle gauges or rack. The jack should securely support the vehicle.

Level and lock the sensors.



Press "Ready."

Perform the S.A.I. turn while observing the bar graphs in the same manner as the caster turn. Refer to "Measuring Caster," below. When S.A.I. measurements are completed, the screen will change to the "Vehicle Measurements and Adjustments" primary screen with the S.A.I. and I.A. measurements shown.

Lower the vehicle.

NOTE:	While lowering the vehicle, camber and S.A.I. measurements will change. However, included angle measurements will remain constant.
--------------	--



Measuring Caster and S.A.I./I.A. Simultaneously (FasterCaster®)

The FasterCaster® measurement feature uses a single bar graph indicator instead of using both a left and right bar graph indicator.

Press “Measure Caster” on the “Vehicle Measurements and Adjustments” primary screen. The “Caster and S.A.I. Measurement” popup screen will appear.

If measuring “FasterCaster® (Caster and S.A.I./I.A.)” is not the default:

Press “Select Measurement,” the “Caster Measurement Selection” popup screen will appear.

Press  or  until “FasterCaster® (Caster and S.A.I./I.A.)” is highlighted.



Press “OK” to select the measurement. The “Caster and S.A.I. Measurement” popup screen will appear.

NOTE:	This selection will not change the aligner default setting. When the aligner is reset, the default settings will be applied.
-------	---

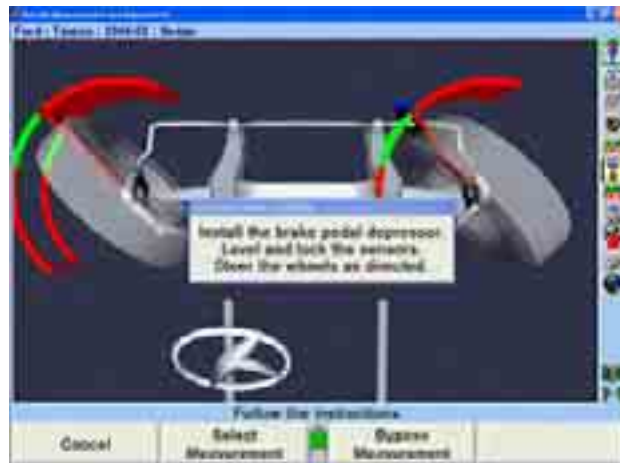
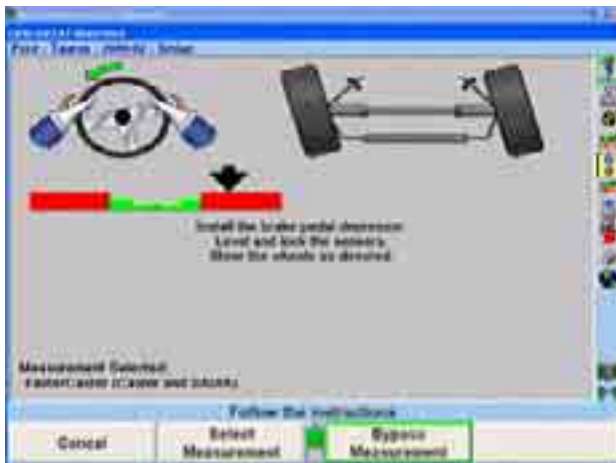
Lock the front brakes using a brake pedal depressor.

Steer wheels straight ahead.

Level and lock the sensors.

Press “Ready.”

The aligner will save the caster measurements and the display will change to show a bar graph and prompt to steer left.



The single left bar graph indicator is controlled by the left wheel.

Observing the bar graph display, steer the wheels to the left until the wheel position indicator is within the center valley of its bar graph. Hold the steering wheel steady until the bar graph disappears.

A single right bar graph will appear and the steering wheel display will indicate to steer to the right.



Observing the bar graph display, steer the wheels to the right until the wheel position indicator is within the center valley of its bar graph. Hold the steering wheel steady until the bar graph disappears.

A single bar graph will appear.

Steer the wheels straight ahead until wheel position indicator is within the center valley of the bar graph.

When the caster and S.A.I. measurements are completed, the screen will change to the “Vehicle Measurements and Adjustments” primary screen with the caster, S.A.I., and included angle measurements shown.

Live Caster

If “Verify Caster Adjustment” is not selected in Common Alignment Preferences then the “Verify Caster Adjustment” step is not added to any alignment procedure. Therefore, live caster (Caster Adjust) is the caster measurement that is shown on all printouts under the label of “Caster.”

To set up “Verify Caster Adjustment,” refer to “Aligner Set Up.”

Lock-Check® Sensor Checking Feature

If either or both of the front conventional sensors are not locked when they are supposed to be locked while measuring Caster/S.A.I., a Lock-Check® warning message is displayed as soon as the alignment technician starts to steer and a sensor rotates in the wheel adapter.

Additionally, if the brake pedal depressor is not applied during a Caster/S.A.I. procedure for which the brakes should be locked, the Lock-Check® warning message is displayed. The Lock-Check® feature can detect the absence of a brake pedal depressor in most cases, however there are some vehicles and conditions under which this condition is not detectable by the Lock-Check® feature.

The warning allows the alignment technician to correct the problem and restart or ignore the problem.

2.5 Additional Measurements

Selecting “Make Additional Measurements” from the “Vehicle Measurements and Adjustments” primary screen provides a choice of additional measurement procedures.

Frame Angle Measurements

Now available for cars and light trucks, this feature is an adaptation of the WinAlign® Heavy Duty software frame angle measurement, which allows proper display of caster for a vehicle that is not level.

Primarily for light duty trucks, WinAlign® software will automatically prompt for a frame angle measurement when the vehicle manufacturer specifies that a frame angle measurement should be used while performing an alignment.



Enter the “Left Frame Angle” and then enter the “Right Frame Angle.” Then select “OK.”

Frame Angle can also be accessed by pressing “Make Additional Measurements” on the “Vehicle Measurements and Adjustments” primary screen. The “Additional Angles Measurement” popup screen will appear.

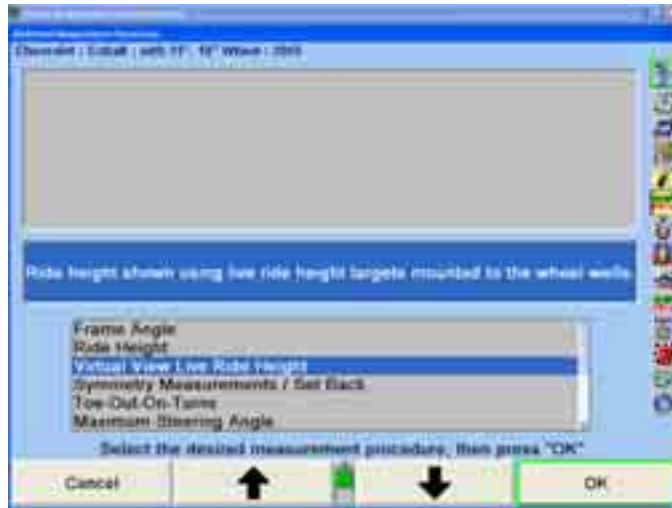
Measuring Ride Height

NOTE: Ride height specifications should be used only as an initial screening test. Measure ride height using the OEM procedure to verify that components meet the OEM requirements.

The DSP200/DSP250 and DSP306/308 sensors will take accurate ride height measurements using the Ride Height (RH) tool.



NOTE: Ride Height can be entered manually or electronically. The “electronic” Ride Height is an optional kit that is installed on both the DSP200/250 and DSP306/308 sensors for measuring the vehicles ride height electronically.

To access Ride Height select “Make Additional Measurements” from the “Vehicle Measurements and Adjustments” primary screen and select ride height. Ride Height can also be added in Set up to be included in the Alignment Procedure.



The manufacturer may vary ride height specifications based on suspension and tire options. Those vehicles will have an additional identification screen listing the suspensions or tire options.



Press  or  to highlight the model variation that applies to the vehicle being measured. The “Ride Height” popup screen will appear with the specification. If the model variation is tire size, then select the tire size that is the original equipment of the vehicle.

NOTE: Lower and jounce the vehicle before measuring Ride Height.

Three methods of entering the measurements are available:

- Manual measurement using keyboard entry
- Electronic measurement using the Ride Height Tool
- Electronic measurement using the Ride Height Remote, 20-1885-1

Measuring Ride Height Using the Ride Height Tool

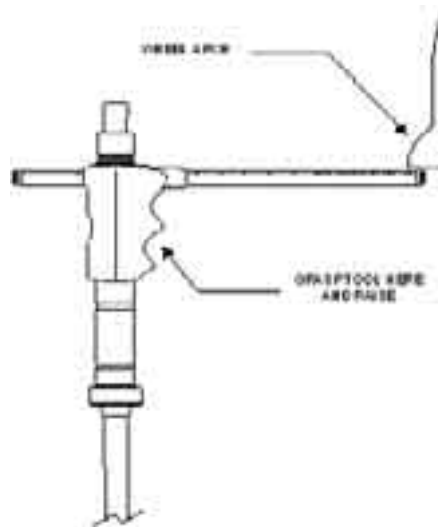
For electronic measurement using Ride Height tool:

Level and lock the sensor on the wheel to be measured.

Insert the grooved rod of the Ride Height tool into the opening in the top of the sensor until the shoulder contacts the sensor.

NOTE: Failure to fully seat the shoulder on the sensor will cause inaccurate RH measurements.

Raise the Ride Height tool until the horizontal arm touches the underside of the wheel arch above the center of the wheel.



Hold the Ride Height tool in position until the console beeps.

The program will display the measurement next to the wheel. The center of the corresponding tire on the screen will turn green if the measurement is within specifications or red if out of specifications. It will turn blue if the specification is not available.



Remove the Ride Height tool and repeat this procedure with the other sensors.

NOTE: Do not jerk the Ride Height tool out of the sensor. This could cause the internal gear to spin resulting in an inaccurate reading.

When the ride height of all the wheels has been measured, press “OK” to save the measurements for printout on the alignment summary.

Ride Height can be re-measured at any time while on the ride height screen. Simply re-insert the ride height tool in the desired sensor until the shoulder contacts the sensor, and then raise the Ride Height tool until the horizontal arm touches the underside of the wheel arch.

NOTE: Failure to fully seat the shoulder on the sensor will may cause inaccurate Ride Height measurements.

In cases where the Ride Height tool is too long or too short, manually enter the measurements from the keyboard.

Measuring Ride Height Using the Keyboard

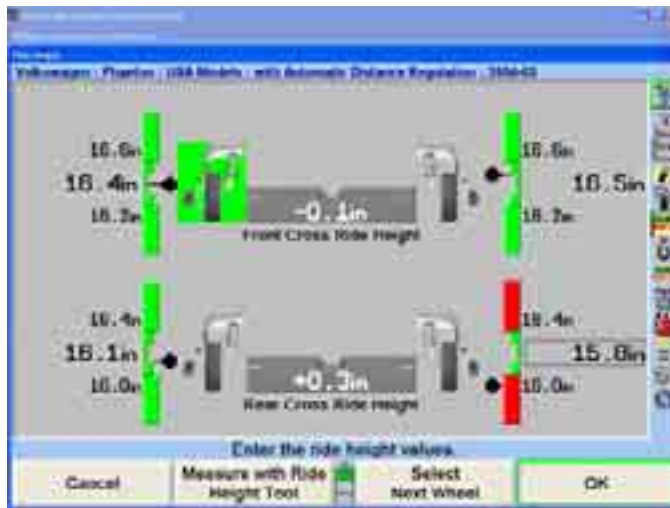
For manual measurement and keyboard entry:

Press “Enter With Keyboard” to enter measurements using the keyboard.

Measure the distance from the mark on the center casting of the wheel adaptor to the wheel well.

NOTE: Make sure that the wheel adaptor is vertical.

Enter the measurement from the keyboard.



Press “Select Next Wheel,” “Enter” or “Tab” to highlight the next wheel or “Shift” and “Tab” to highlight the previous field. The program will display the measurement next to the wheel. The center of the corresponding tire on the screen will turn green if the measurement is within specifications or red if out of specifications. It will turn blue if the specifications are not available.

Repeat this procedure with the other wheels.

When the ride height of all the wheels has been measured, press “OK” to save the measurements for printout on the alignment summary.

Ride Height can be re-entered at any time while on the ride height screen. Simply press “Select Next Wheel,” “Enter,” or “Tab” to highlight the next wheel or “Shift” and “Tab” to highlight the previous field. Re-measure the distance from the mark on the center casting of the wheel adaptor to the wheel well, and then enter the measurement using the keyboard.

NOTE: Make sure that the wheel adaptor is vertical.

Vertical bar graphs and an illustration of a tire are used to indicate vehicle height in relation to the specification. The center of the bar graph represents the specification.

The large numerical values on the outside of the bar graphs represent the **actual measurement**. The “ideal” or “preferred” adjustment would find the indicator arrow next to the white line of the center bar and the numeric value reading the preferred specification for the vehicle.

Measuring Ride Height Using the Ride Height Remote

NOTE: Recalling certain vehicles from the information database, will automatically bring up the “Ride Height” screen, such as Volkswagen Touareg.

Refer to Form 5134T, Operation Instructions for Ride Height Remote Kit 20-1885-1, for detailed operation information.

When prompted by WinAlign program, begin ride height measurement procedure with the wheel indicated.

Reference the manufacture’s specifications of the vehicle to determine the appropriate reference points for the ride height measurements.

Press the “measurement” button once for automatic measurement mode or twice for manual measurement mode.

NOTE: Locate the cable pointer directly under or above the second reference point. Any excess cable pulled from the ride height remote to reach the second reference point will result in larger than actual measurement value.

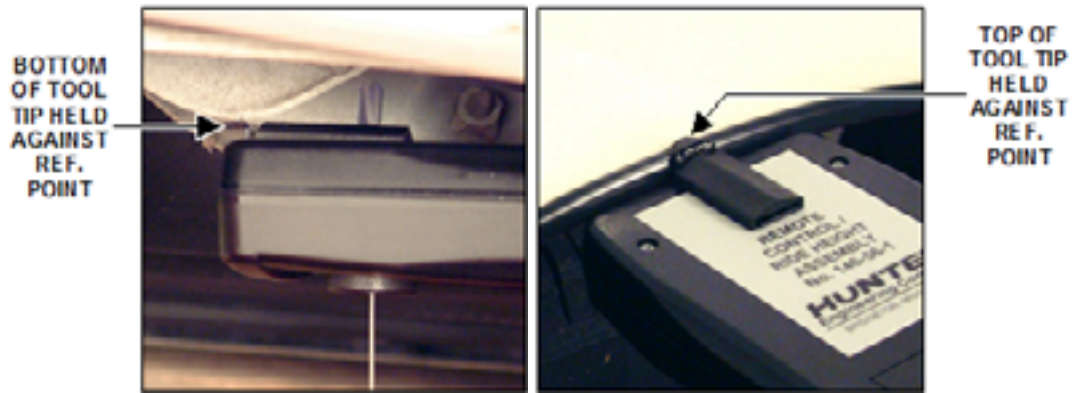
Place the ride height remote at one of the reference points, using the foot or tool tip located on the bottom of the ride height remote in one of the following manners:



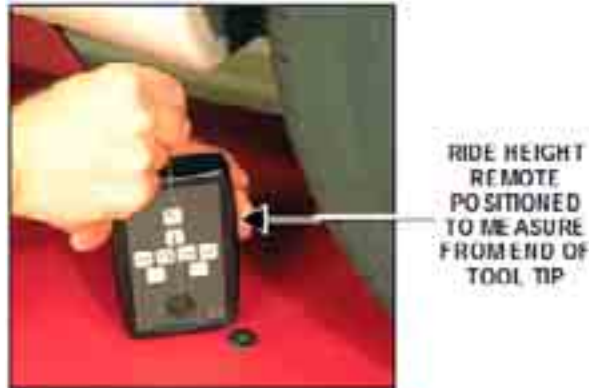
Place the bottom of foot on the reference point. (preferred method)



Hold the top or bottom of the tool tip against the reference point. (alternate method)



With the ride height remote turned with the transmitter down, place the end of tool tip against the reference point (alternate method).



Pull the cable straight from the ride height remote to place the tip of cable pointer to the reference point.

To measure to center of wheel, match the notch in cable pointer to the central pin on the wheel clamp or tire clamp assembly. Refer to "Form 5134T, Operation Instructions for Ride Height Remote Kit 20-1885-1."



NOTE:

A measurement error is indicated by two short beeps and the status LED turning orange. Possible causes for the error are the cable was pulled too quickly (too fast for encoder to respond), the cable snapped-back (pulley slipping) or the cable was pulled too far beyond the desired length (pulley slipping). Return cable pointer to home position and then try again.

Store the length measurement by holding the pointer steady at a distance (automatic measurement mode) or by pressing the “measurement” button (manual measurement mode).

A beep and a green “status” LCD indicate the measurement has been stored within the ride height remote.

Return the cable pointer to home position.

<p>NOTE: Pulling the pointer from the ride height remote again or pressing the “measurement” button will cause the measurement to be reset to zero.</p> <p>The ride height remote will also reset to zero after 10 seconds of inactivity.</p>
--

Point the ride height remote’s transmitter toward the cabinet’s receiver and press the “transmit” button. The transmit LED flashes red to indicate that the ride height remote is transmitting the ride height measurement.

<p>NOTE: The transmitter is a “line-of-sight” device that will not transmit a signal through solid objects.</p>
--

The distance measured will be displayed within the appropriate field on the WinAlign screen. The cursor will then move to the next ride height entry field.

Repeat process to enter all ride height measurements, as prompt by WinAlign program.

<p>NOTE: To conserve battery power, the ride height remote enters a sleep mode after 1 minute of inactivity.</p>

Measuring Ride Height Using Ride Height Targets

Ride height can be critical to proper alignment in many vehicles. Improper ride height can affect most alignment adjustments. It can also be a sign of worn or damaged suspension components. Using the ride height targets to show live measurements is a great tool for adjusting ride height without measuring tapes or multiple trips around the vehicle. Any adjustments made using the ride height targets is shown instantly, making the job of adjusting ride height much easier.

Ride Height Targets require WinAlign® 9.0 or higher and DSP600 targets.

Installing the Ride Height Targets

Clean an area on the vehicle’s wheel well, directly above the spindle.

Apply adhesive strip, 162-122-2, to ride height target.

<p>NOTE: Replace the adhesive strip when it becomes excessively dirty or loses its adhering ability.</p>

Secure ride height target to vehicle with adhesive strip, 162-122-2, at the highest point of the wheel well, directly above the spindle. The target should face the same direction as the DSP600 targets. Make sure the lip on the target is contacting the underside of the fender before pressing the adhesive against the vehicle.



WinAlign® will display an alert if the target is placed incorrectly. Follow the on-screen directions to correct.

Repeat for each wheel.

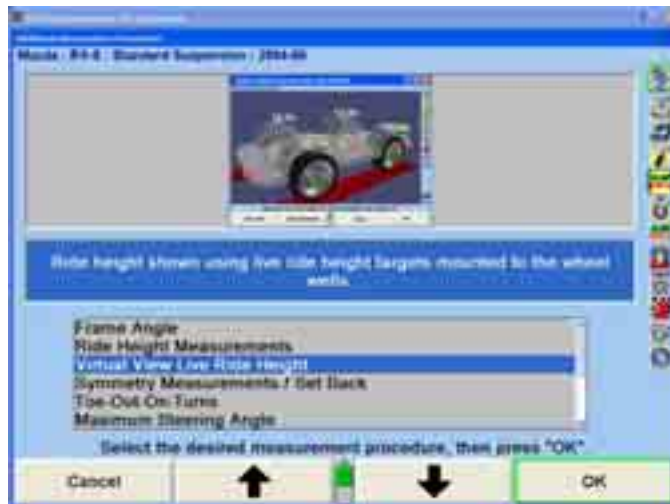
Virtual View Live Ride Height

NOTE: Virtual View Live Ride Height requires using Ride Height targets. Virtual View must be enabled is Set-up to show Virtual View Live Ride Height. *For more information on Live Ride Height Targets refer to Form 5375T.*

Virtual View Live Ride Height displays a “live” reading of the height difference between the fender well and the spindle. This can be very helpful when adjusting vehicles with torsion bar, air ride or other adjustable ride height suspension.

TIP: Virtual View Live Ride Height is a great tool to show the before and after measurements when installing lowering or lift kits on vehicles. Don't forget to give the customer printouts!

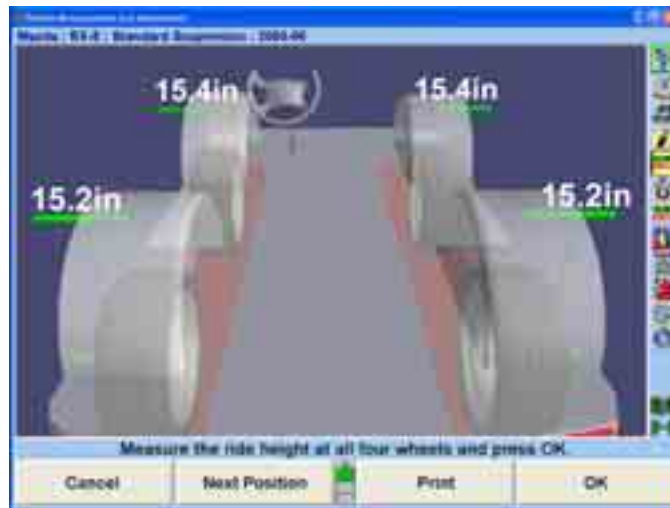
Certain vehicles that require ride height measurements will include this feature within the alignment procedure and will display automatically. If ride height is not automatically part of the alignment procedure, select “Virtual View Live Ride Height” from the Additional Measurements menu.



Install the ride height sensors on each fender well in line with the spindle, as directed above.



As soon as the targets are detected by the cameras the values will be graphically displayed. Select "Next Position" to rotate vehicle image.



The Virtual View ride height image can be customized selecting different options as shown from the expanded softkeys below. All highlighted keys represent displayed items.



Remove the ride height targets when measurements and adjustments are complete.

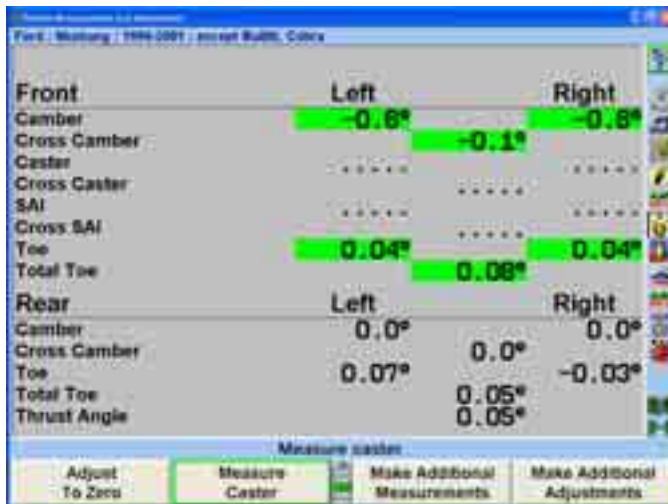
Live Ride Height

NOTE: DSP600 Targets must be installed along with the Ride Height Targets for WinAlign® to show live ride height measurements.

Live Ride Height measurements may be used with Virtual View or in bar graph form. If not using “Virtual View Live Ride Height,” use the following instructions to measure ride height with the “Live Ride Height” bar graph screen as shown below.



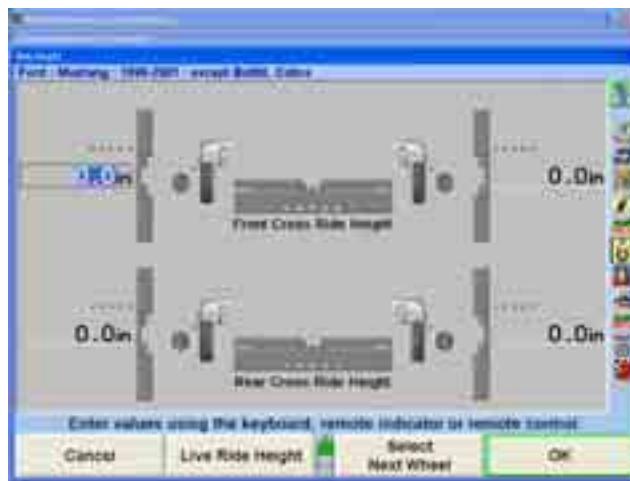
If the “Live Ride Height” screen does not appear automatically as part of the alignment procedure, select “Make Additional Measurements” from the “Vehicle Measurements and Adjustments” screen.



Select "Ride Height" from the menu and press "OK."



Select "Live Ride Height" to measure ride height using the ride height targets.



NOTE: The bar graphs will remain gray unless the selected vehicle has specifications for spindle-to-fender measurements.

WinAlign® displays the "Ride Height" screen using live measurements.



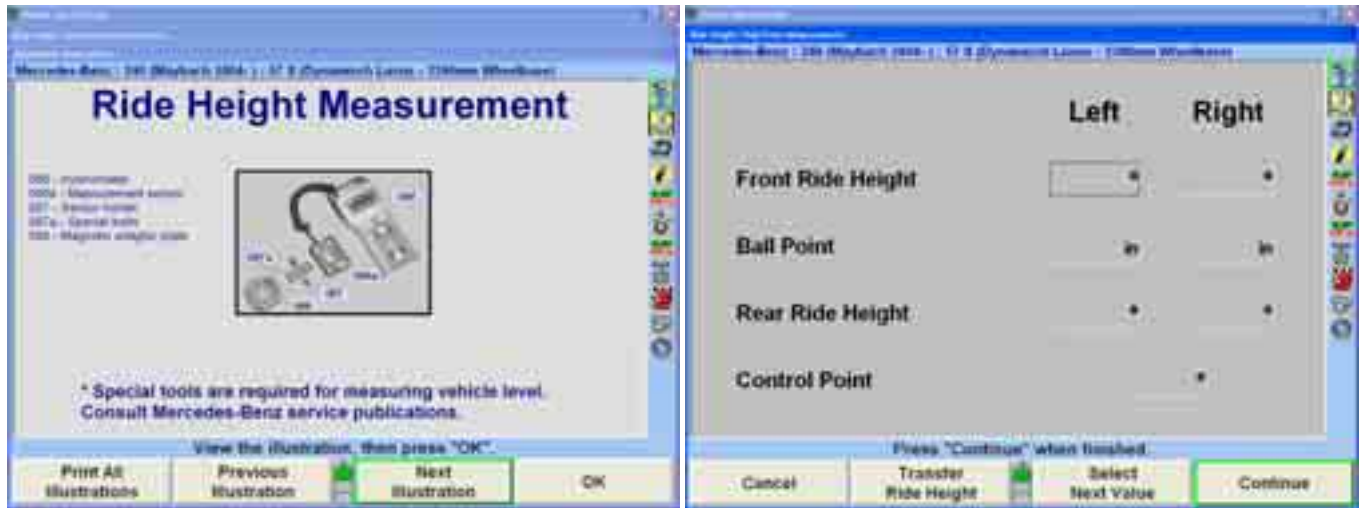
NOTE: The bar graphs will remain grey unless the selected vehicle has specifications for spindle-to-fender measurements.

Remove the ride height targets when measurements and adjustments are complete.

Measuring Ride Height Using the Romess Inclinometer for Mercedes

When certain Mercedes-Benz vehicle specifications are selected ride height should be measured using a Romess inclinometer.

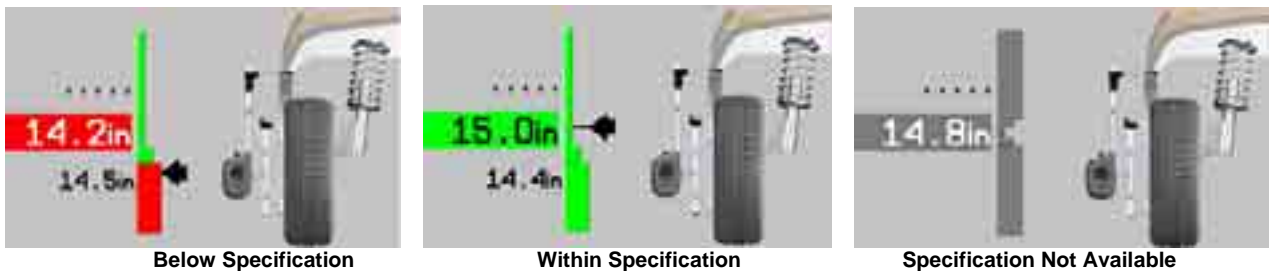
The M-B Romess tool CM-09606 is used to measure ride height which is required to obtain caster and camber specifications.



Basic instructions are available under "Illustrate Adjustments. For specific detailed instructions on the operation of the Romess Inclinometer, please refer to the documentation included with the tool from the manufacturer.

Ride Height Bar Graphs

A bar graph with a red base and red fender indicates the measurement is below specification. A completely green bar graph and green fender indicates the measurement is within specification. Most vehicles have no upper limit in their specification. A gray bar graph and blue fender indicates specifications are not available.



To display the recommended specifications on the bar graphs, press "Show Specs." If the specifications are displayed, press "Hide Specs" to remove them from the screen.

NOTE: Ride Height can be measured in inches or millimeters.

Cross Ride Height

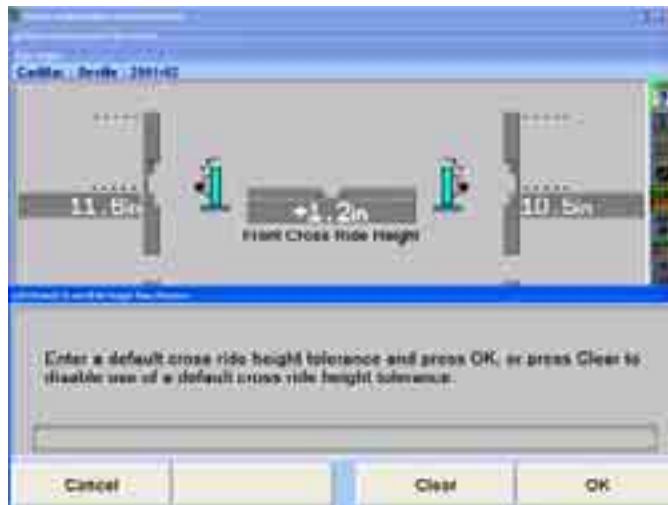
Ride Height also displays user-defined cross ride height bar graphs for each axle. This measurement will help to determine if a vehicle is sloping excessively side-to-side indicating potential problems with suspension, frame, or body components.



A positive arrow position on the graph represents a greater amount of ride height on the left side of the vehicle, a negative arrow position represents a greater value on the right side of the vehicle.

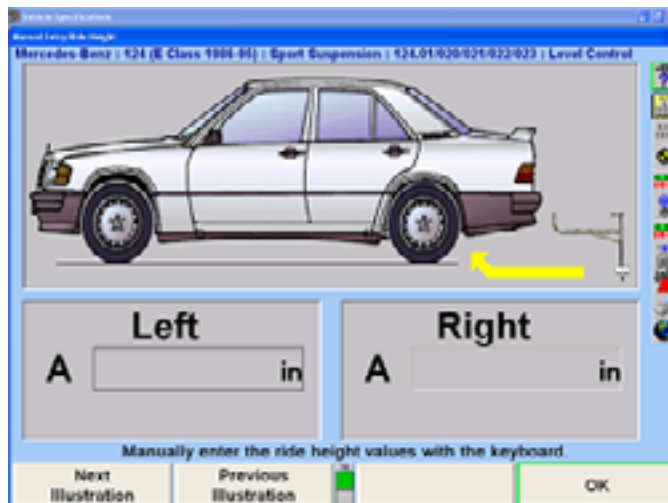
There is a "Default Cross Height Spec" softkey that allows entry or deletion of the user-defined specification. The user may define a default cross ride height specification to be applied to all cars for which there is no manufacturer's ride height specification.

Select "Default Cross Height Spec." A dialog box will open. Enter the default cross ride height spec and press "OK."



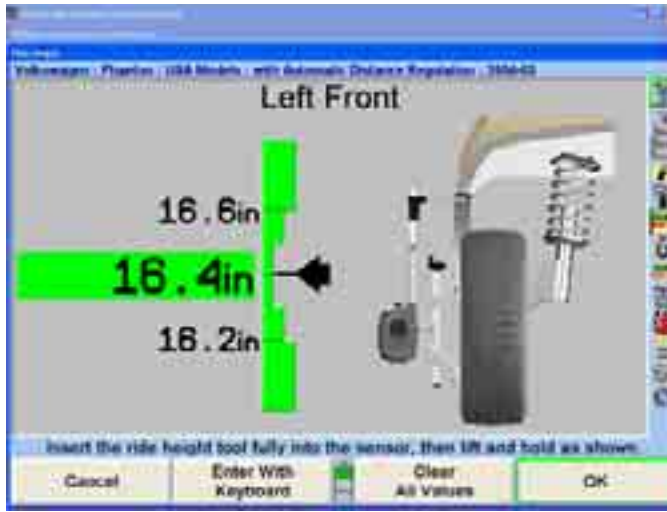
Ride Height Dependent Specifications

Some manufacturers require ride height to be measured to determine the appropriate alignment specifications. Enter ride height measurement(s) into the left and/or right dialog box of "Manual Entry Ride Height" popup screen. WinAlign will use the ride height data to generate the recommended front and rear camber, caster, and toe specifications.



Zoom

When measuring Ride Height using the RH tool, the aligner will detect which wheel is being measured, and will zoom to the bar graph and image of that wheel. After the measurement has been taken, the fender will turn green if the measurement is within specifications, or red if it is out of specifications, as shown below.



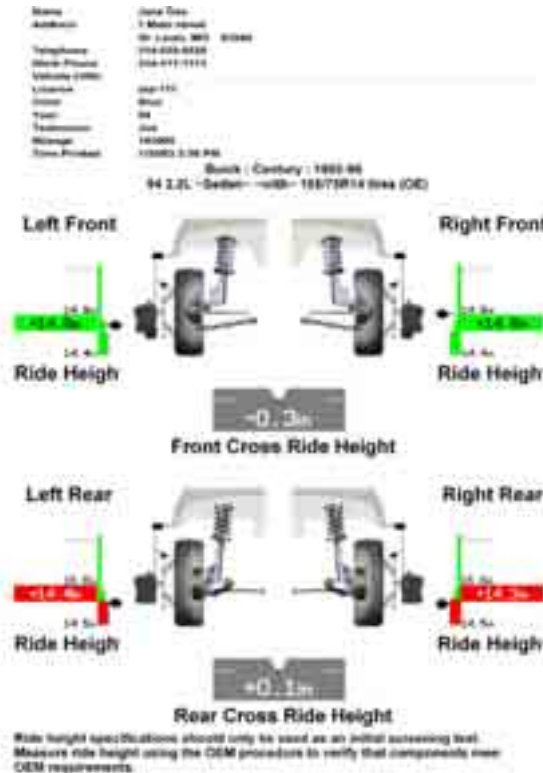
The screen will remain on the individual wheel for about ten seconds, and then it will display all four wheels.

To disable the zoom, press “Disable Zoom.”

NOTE:	The screen will not zoom if the keyboard is being used to enter the measurements.
-------	---

Printing Ride Height

When “Print Ride Height” is selected all the bar graphs shown on the screen and any specifications used will be printed.



Symmetry Angle/Set Back Measurements

The following measurements are available by selecting “Symmetry Measurements/Set Back” from the “Additional Measurement Procedures” screen.

- Front Set Back
- Rear Set Back
- Wheelbase Difference
- Left Lateral Offset
- Right Lateral Offset
- Track Width Difference
- Axle Offset

Set Back Procedures

To achieve best results, observe the following practices when measuring symmetry angles:

NOTE: Use the same wheel adapter mounting hardware (i.e. spade sleeves) on all wheels. Mixing different types of wheel adapters will result in incorrect measurements.

Steer ahead.



Level and lock the sensors.

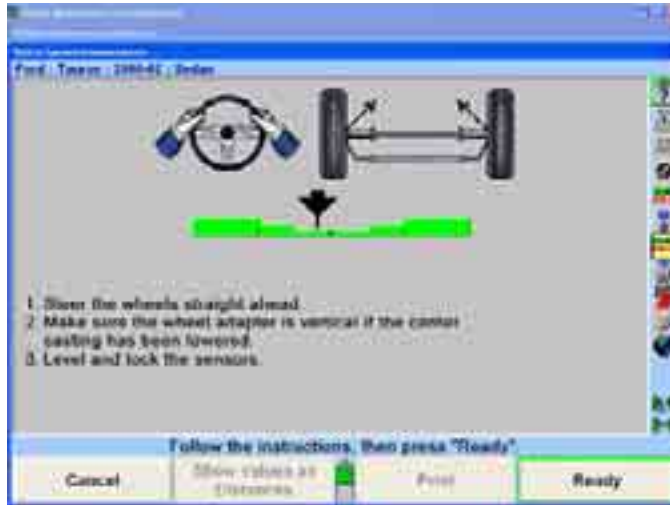
Make sure the wheel adapter is vertical if the center casting has been lowered.

NOTE: Set Back is accurately measured only when the wheels are steered symmetric about the centerline of the vehicle. This procedure will “snapshot” the Set Back and Symmetry Measurements when the wheels are steered straight ahead and the “Ready” key is pressed.

To measure Symmetry Angles and Set Back, press “Make Additional Measurements” on the “Vehicle Measurements and Adjustments” primary screen. The “Additional Measurement Procedures” popup screen will appear.



Press  or  to select “Symmetry Measurements/Set Back” and press “OK.” The “Vehicle Symmetry Measurements” popup screen will appear.



Follow the instructions below as shown on the display.

NOTE: Before using Symmetry Measurements, refer to “Symmetry Angle/Set Back Definitions” for definitions and tips.

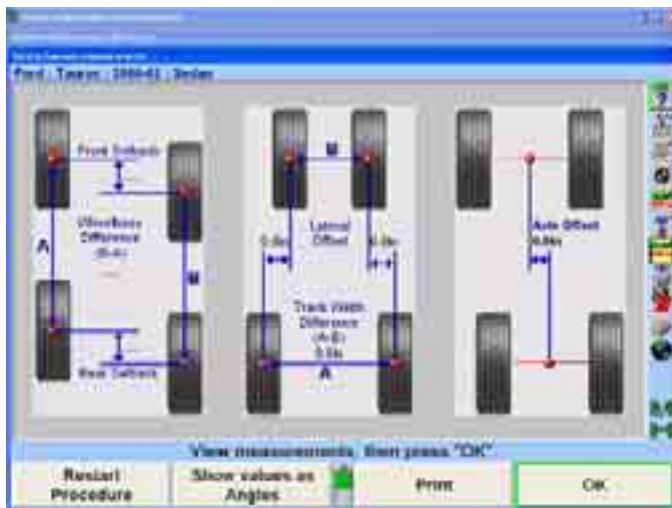
Press “Ready.” The screen will display a graphic representation of the symmetry measurements and Set Back with the measured values indicated.

If the Wheelbase and Track Width specifications are available for the current vehicle, the measurements will be displayed as linear distances.

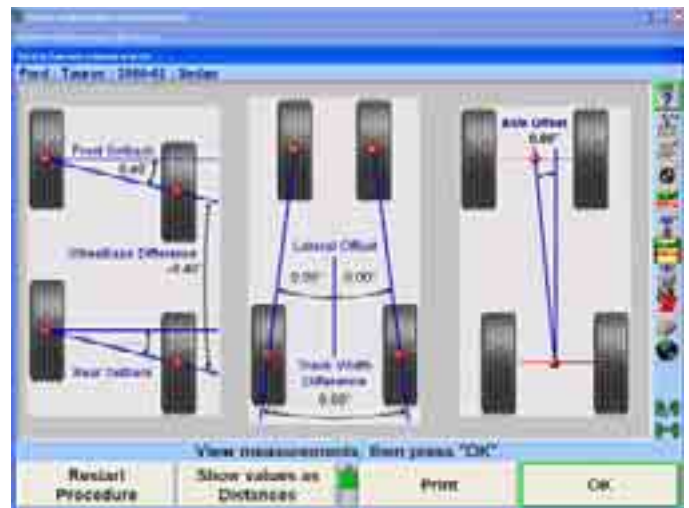
OR

If the Wheelbase and Track Width specifications are not available for the current vehicle, the measurements will be displayed as angles.

NOTE: To enter Track Width specifications, press “Show Secondary Specifications” on the “Vehicle Specification” primary screen. Enter the front track width into the Track Width Dialog Box. Press “Show Rear Axle” on the “Vehicle Specification” primary screen. Enter the rear Track Width into the Track Width Dialog Box.



Linear Distances



Angles

Press "OK." The screen will return to the "Vehicle Measurements and Adjustments" screen and the frozen symmetry measurements and Set Back measurements will be displayed as shown below.

NOTE: These angles are shown on the screen and on the printout only if they have been measured.

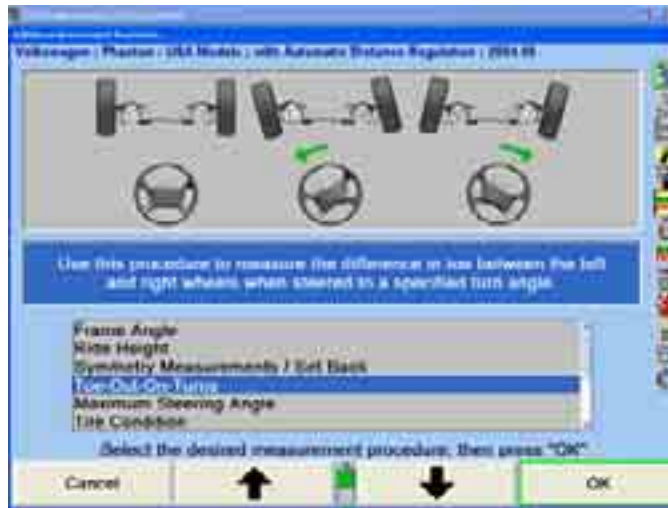


Toe-Out-On-Turns

NOTE: To perform this procedure, electronic turnplates, DSP sensors with the optional Toe-Out-On-Turns kit, DSP300 conventional, or DSP400/600 optical sensors are required. To select sensors or turnplates, refer to "Aligner Set Up," page 173.

Measuring Toe-Out-On-Turns can help find worn or bent steering/suspension components.

Press "Make Additional Measurements" on the "Vehicle Measurements and Adjustments" primary screen. The "Additional Measurement Procedures" popup screen will appear.

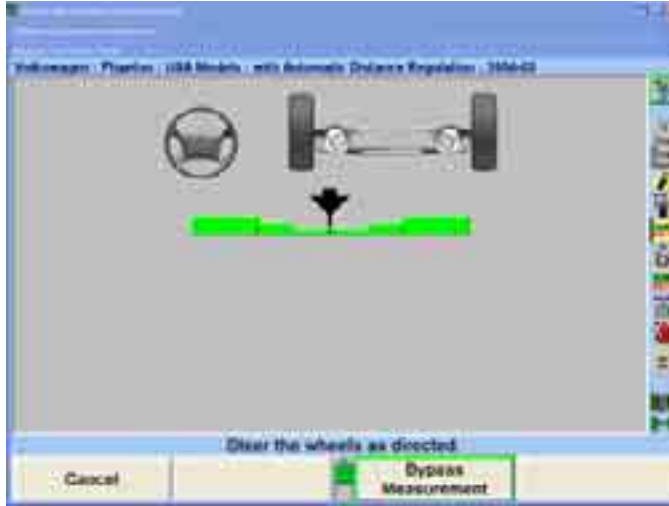


Press or to select "Toe-Out-On-Turns," then press "OK."

If using DSP sensors with Toe-Out-On-Turns kit:

Connect elastic toe lines and adjust until taut.

A single bar graph on the display will prompt to steer the wheels to the straight ahead position. If the sensors are compensated, the bar graph will be red. If the sensors are not compensated, the bar graph will be gray.



Steer the wheels until the wheel position indicator is in the center valley of the bar graph.

NOTE: If sensors are not compensated and electronic turnplates are being used, press "Initialize Turnplates."

The program will save the measurements and the display will change to show two bar graphs and prompt to steer left.

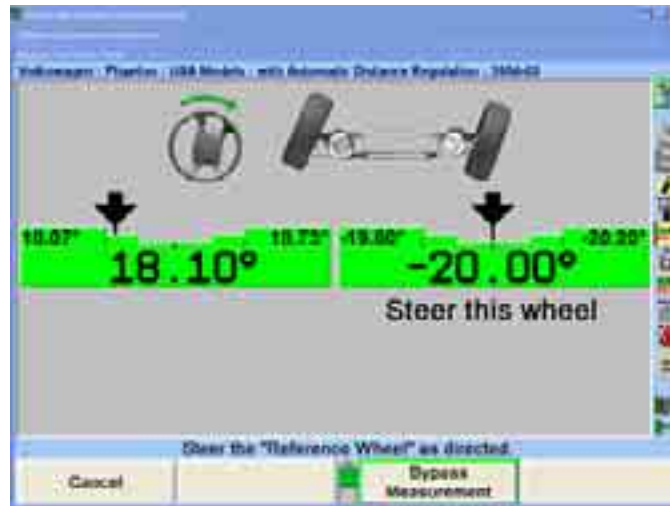


Observing the bar graphs, steer the wheels to the left until the indicated "steer" wheel position indicator is within the center valley of the bar graph.

Hold the steering wheel steady. The measurements will be saved.

If Toe-Out-On-Turns specifications have not been entered for the selected vehicle, steer to the desired angle, then press "Store Measurements." The measurements will be stored for later computations.

Two new bar graphs will appear.

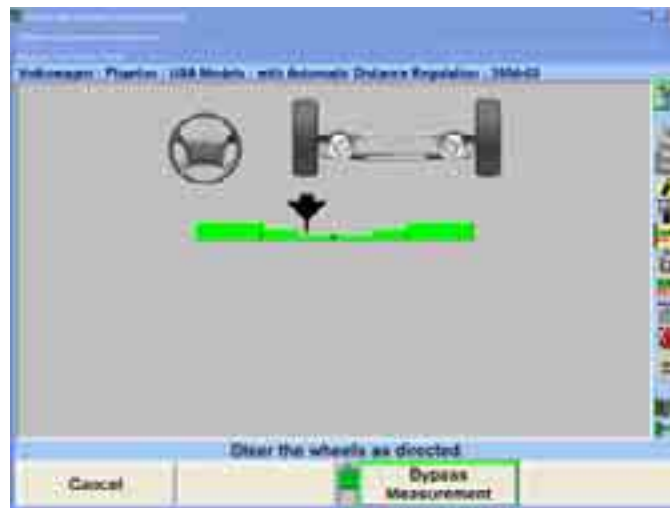


Observing the bar graph, steer the wheels to the right until the indicated “steer” wheel position indicator is within the center valley of the bar graph.

Hold the steering wheel steady. The measurements will be saved.

If Toe-Out-On-Turns specifications have not been entered for the selected vehicle, steer to the desired angle, then press “Store Measurements.” The measurements will be stored for later computations.

A single bar graph will appear.



Steer the wheels until the wheel position indicator is within the center valley of the bar graph. The measurements will be saved and the screen will return to the “Vehicle Measurements and Adjustments” primary screen.



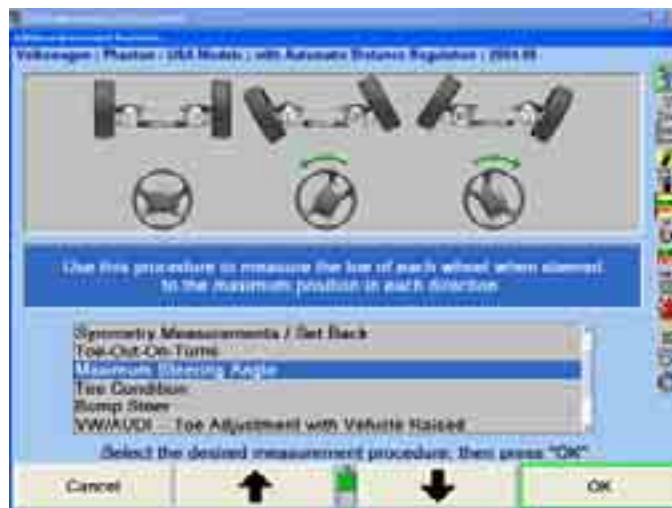
The Toe-Out-On-Turn results are displayed as “Left Turn Diff.,” which is the toe difference between the left and right wheels when steered to the left, and “Right Turn Diff.,” which is the toe difference between the right and left wheels when steered to the right. If these measurements are not within specifications, the steering mechanism should be inspected for worn or damaged parts.



Maximum Steering Angle

NOTE: To perform this procedure, electronic turnplates or DSP sensors with the optional Toe-Out-On-Turns kit are required. Manual entry of data is also available. To select sensor or turnplates, refer to “Aligner Set Up,” page 173.

Measuring maximum steering angles (lock-to-lock steering) can help find worn or bent steering/suspension components.

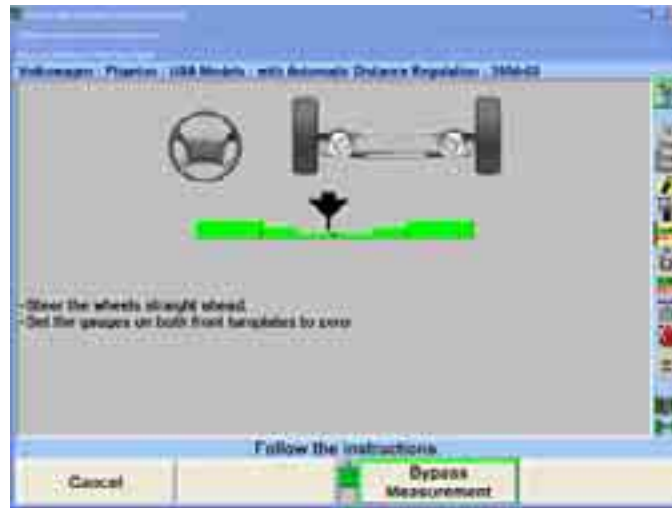
Press “Make Additional Measurements” on the “Vehicle Measurements and Adjustments” primary screen. The “Additional Angles Measurement” popup screen will appear.



Press  or  to select “Maximum Steering Angle,” then press “OK.” A single bar graph on the screen will prompt to steer the wheels to the straight ahead position.

If using DSP sensors with Toe-Out-On-Turns kit connect elastic toe lines and adjust until taut.

A single bar graph on the display will prompt to steer the wheels to the straight ahead position. If the sensors are compensated, the bar graph will be red. If the sensors are not compensated, the bar graph will be gray.



Steer the wheels until the wheel position indicator is in the center valley of the bar graph.

NOTE: If sensors are not compensated and electronic turnplates are being used, press "Initialize Turnplates."

If a caster steer has been performed, press "Ready."



The program will save the measurements and the display will change to show two bar graphs and prompt to steer left.

Steer the wheels left until the steering wheel stops at the lock. The lock angles are displayed on the CRT.

If a wheel stops moving for more than two seconds after the measurement is above 25 degrees, the program will store the measurements. This feature is called "Auto Store." If Auto Store is not desired, pressing "Disable Auto Store" can turn it off. If disabled, press "Store Measurements" when the wheels are at their maximum steering angle.

NOTE: If the measurement is stored before the wheel reached the lock position, press "Cancel" and restart the procedure.

The screen will change to prompt for a right turn.

Steer the wheels right until the steering wheel stops at the lock. The lock angles are displayed on the CRT.

Once the measurement is above 25 degrees, if a wheel stops moving for more than two seconds the program will store the measurements.

NOTE: If the measurement is stored before the wheel reached the lock position, press "Cancel" and restart the procedure.

Steer the wheel back to the center valley position of the bar graph.

Press "Ready" if the caster measurement was previously taken.

The display will change to the alignment measurements display. The results are shown as "Maximum Left Turn" and "Maximum Right Turn." If these measurements are not within specifications, the steering mechanism should be inspected for worn or damaged parts.

Tire Condition

The tread condition, tread depth, and tire pressure should be evaluated, before continuing with the alignment procedure

"Tire Condition" may be enabled in Aligner Setup as an alignment procedure or can be selected from "Additional Measurements." Tire inspection allows tread wear, tread depth, and tire pressure to be documented in the alignment procedure.



Having a tire with a tread condition, marginal tread depth, or not inflated to the manufacturer's inflation specification may result in an out of alignment complaint even if the vehicle's alignment is within specifications.

The selected tire for inspection can be changed by selecting “Next Wheel” or by selecting the desired wheel icon in the upper right-hand corner of the screen.



The inspection selection can be changed by selecting “Tread Condition,” “Tread Depth” or “Tire Pressure” from the softkey menu or using the icons in the upper left-hand corner of the screen.



Tread
Condition



Tread Depth



Tire Pressure

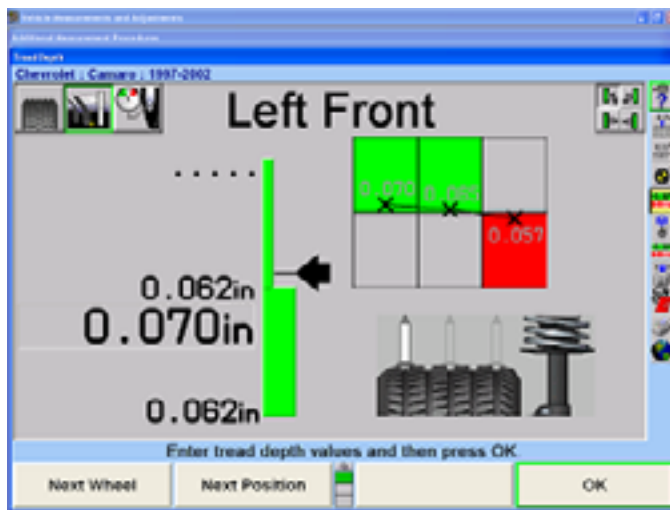
From the “Tread Condition” screen, an assortment of tread conditions are available for selection for each wheel. “Normal Wear” selection will appear green when selected. Marginal conditions like cupping or feathering will appear in yellow. Hazardous conditions such as tread or ply separation will appear red when selected.



Selecting the “Tread Depth” icon will display the “Tread Depth” popup screen. The “Tread Depth” popup screen helps document the tread depth of each tire. The smallest measurement taken for each wheel is entered into the corresponding data box for all four wheels. Any wheels with measurements that are under specifications are shown in red.



Selecting “Zoom In” allows the tread depth of each tire to be entered for one to three locations across the tread. Depth should be measured in even intervals across the entire tread area. Enter the depth of each location. Repeat this procedure for each tire. The measurement units for tread depth can be changed in Aligner Set up.



Selecting the “Tire Pressure” icon will display the “Tire Pressure” popup screen. The “Tire Pressure” popup screen allows you to document the inflation level of each tire. If all tires are set to the same specification, select “Filled to Spec.”



Enter the tire pressure specification that all tires were set to and select “OK.”



The tire pressure screen will be updated to show all tires filled to specification.



Selecting “Print” from any of the tire inspection screens will print the tire inspection information. Print should be selected after all tire inspection information has been entered.

After evaluating tread condition, tread depth, and tire pressure, select “OK” to exit the “Tire Inspection” procedure.

Bump Steer Measurement

Overview

“Bump Steer” measures the amount of toe change caused by the steering mechanism (linkage and/or rack and pinion) not remaining parallel to the road surface. This is most notable in toe changes caused by dips or bumps in the road.

From the “Vehicle Measurements and Adjustments” screen, press “Make Additional Measurements” and the “Additional Measurement Procedures” popup screen will appear as shown below. Press  or  to select “Bump Steer” and press “OK.”



The initial Bump Steer measurement screen will appear. Steer the vehicle straight ahead according to the bar graph and select “Ready.”



Below is a list of the Bump Steer measurement softkey functions available.

Exit	Down	Up	Snapshot Values
Restart Procedure	Undo last Snapshot	Save Before Measurements	Hide "Before" Measurements
Print	Clear current values		
Save Values	Load saved values	Load for comparison	Copy Chart to clipboard
Show File Information	Show Comparison File Info		Help

Select "Up" or "Down" when raising or lowering the vehicle on the rack. Height will be illustrated in .5" increments. The bar graphs are live and will reflect any changes in alignment angles. The drop-down menu offers a list of different angle views.

"Snapshot Values" will take an immediate image of the incremental measurements. "Undo Last Snapshot" will remove the previous incremental image snapshot.

"Save Before Measurements" will save the current collective bump steer measurements as "before" measurements, indicating the initial status of the vehicle. "Hide Before Measurements" will hide the "before" measurements from the screen. Select "Clear Current Values" to remove the values completely.

Select "Save Values" to save the measurements to floppy disk. "Load Saved Values" will retrieve measurements from floppy disk. "Load for Comparison" downloads the measurements to the screen indicated by a dotted line for comparison to current live readings.

"Copy Chart to Clipboard" saves the current visible chart to the Windows clipboard. Run the Wordpad program and select "paste" to transfer the chart as an image to a Wordpad document.

"Show File Information" displays the specifics of the current measurements in tabulated text format. "Show Comparison File Info" displays the same information for the loaded comparison file.

Select "Print" to print all the measurements charts.

Measuring Bump Steer

Follow the instructions on the screen. Take a snapshot at ride height.

Raise the rack and select "Snapshot Values" to measure the changes as the vehicle rises. Snapshots can be taken as often as desired.

Raise the vehicle at least three inches to measure incremental changes. Use the drop-down menu to select different angle views. Using the mouse to select various snapshots will produce a virtual view image of the front wheels.

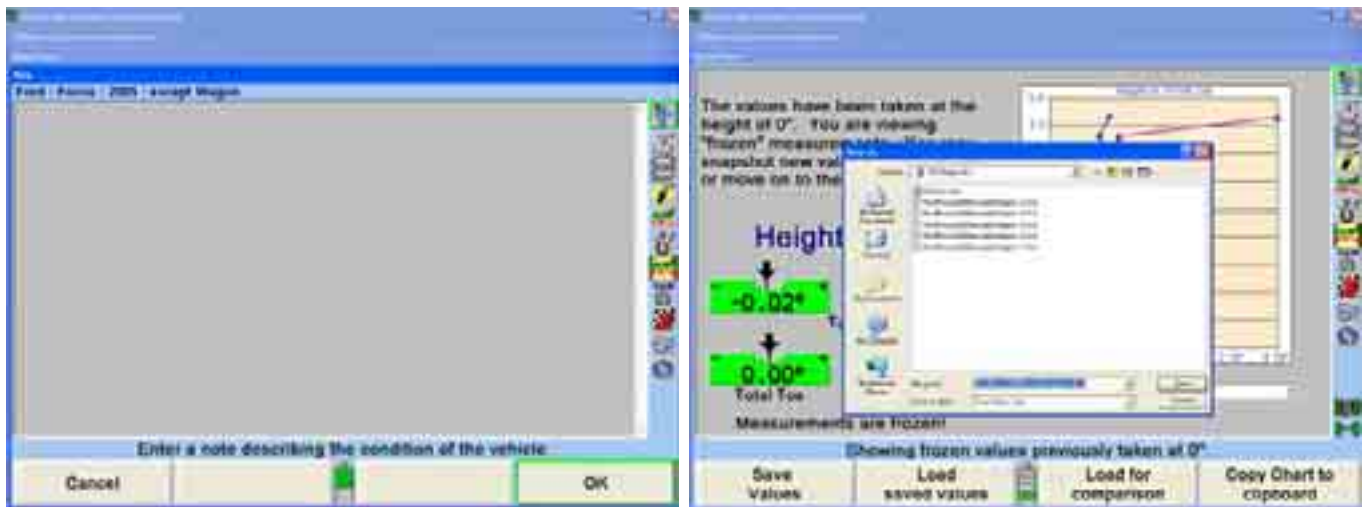
Click and hold the left mouse button and move the mouse around the bar graph to change the virtual view image displayed. This will also break the chart up into three columns representing the left side of the vehicle, a center view, and a right side view. Holding the mouse over a measurement line on the chart will display the exact measurements.



After lifting the vehicle to a desired height, repeat the process as the vehicle is lowered. At ride height connect the Bump Steer Winch. Using the winch compress the vehicle below ride height, continuing to take snapshots at various increments.

NOTE: The tires should not be raised off the turnplates and the vehicle should not be lowered onto the strikeout bumpers.

Once all measurements have been captured, select "Save Values" to store measurements to floppy disk. These measurements can be recalled at any time. A note can be stored with the readings. Enter any specific text necessary to be stored with the measurements and select "OK." Insert a floppy disk and select save. A custom name can be entered, otherwise the measurements will be saved under the specs name (i.e. "FordFocus2005exceptWagon.txt").



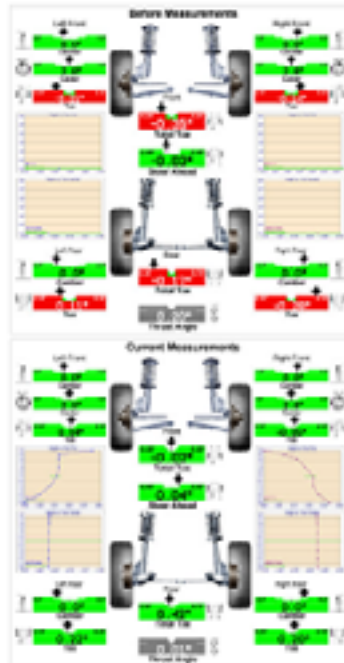
Saved results can later be uploaded by selecting “Load for Comparison.” When the softkey is selected, choose the location on the pc (or floppy drive) where the .txt resides. Select the file and click “Open.” The image of the saved results will display as a dotted line.



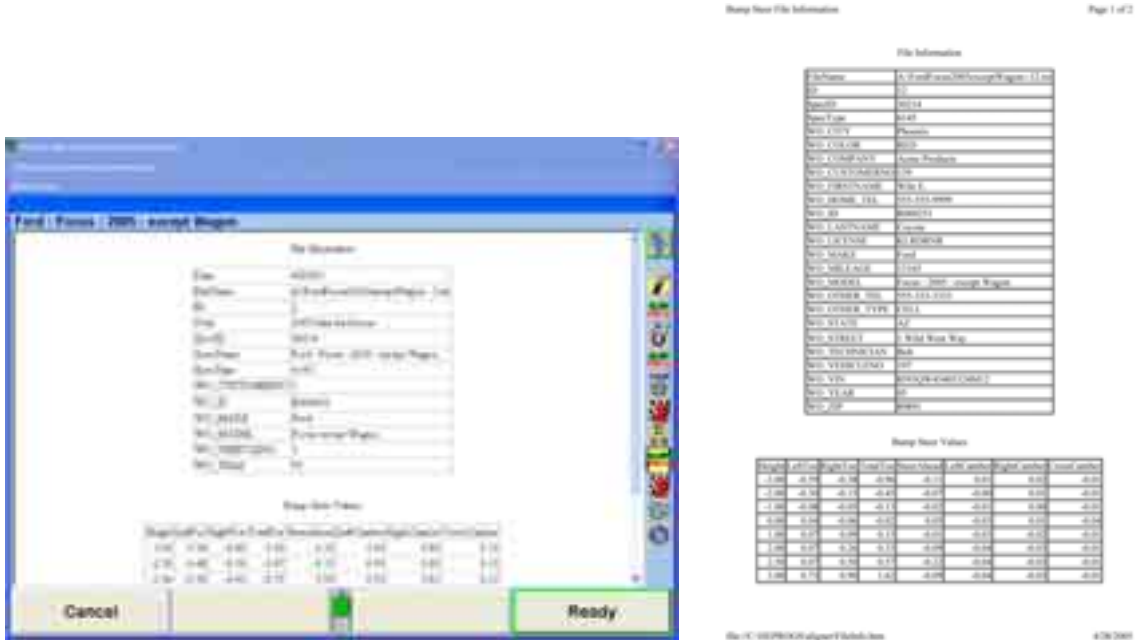
Selecting “Print” while on the chart screen will offer the option of printing “Before” or “Current” measurements or both together in chart form.

Name	Wile E. Coyote
Company	Acme Products
Address	1 Wild West Way Phoenix, AZ 85001
Telephone	555-555-9999
Other Phone	555-333-3333 CELL
Vehicle (VIN)	88R3UWA848522AM12
License	RLRDRNR
Color	RED
Year	05
Technician	Bob
Mileage	13165
Time Printed	4/28/95 11:12 AM

Ford : Focus : 2005 : except Wagon



Select “Show File Information” or “Show Comparison File Info” to view table formatted text of the measurements. These files can also be printed and will include all readings and customer information, if entered.





Select “Exit” when all measurements have been completed and reviewed.

Toe Raised Procedures

The “Toe Raised Procedure” is an adjustment that is required for some specific VW/AUDI models. If one of these models is recalled from the specification database, the “Toe Raised Procedure” will be automatically entered during the alignment procedure. If the indicated special tools are not available, this measurement and adjustment cannot be made. A flow chart of the “Toe Raised Procedure” is added to the end of this section for reference.

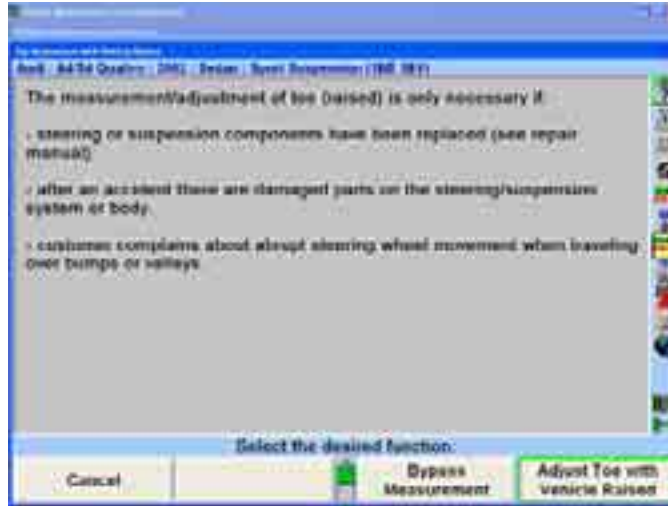
From the “Vehicle Measurements and Adjustments” screen, press “Make Additional Measurements” and the “Additional Measurement Procedures” popup screen will appear as shown below.



Press  or  to select “VW/AUDI - Toe Adjustment with Vehicle Raised” and press “OK.”

At the “Toe Adjustment with Vehicle Raised” screen will be several messages why a vehicle may need a Toe-Adjustment with vehicle Raised. Such conditions as:

- Steering or suspension components have been replaced.
- There are damaged parts on the steering/suspension system or body.
- Customer complains about abrupt steering wheel movement when traveling over bumps or valleys.

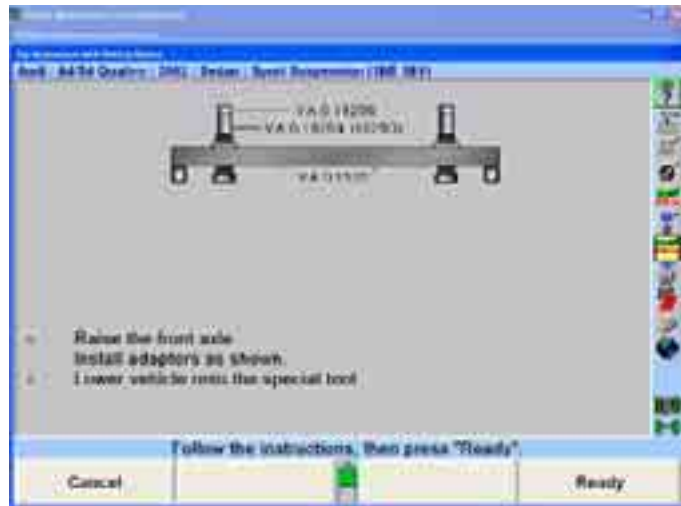


Selecting “Adjust Toe with Vehicle Raised” will display the following screen. The screen will show a picture of the VAG extender or adapter. This assembly will vary according to the specification (A4 A6, A8 or Passat Sport) of the vehicle. Follow the instructions on the screen.

NOTE: When using the special tool with extenders, make sure of good contact around subframe mounting points for safety and to prevent damage to undercarriage or suspension system.

Install special tool as shown.

Unscrew spindles until they make contact around vehicle subframe mounting bolts.



Press “Ready” and the following screen will appear. The screen will present an illustration of the proper place of adjustment and two adjustment bars (left and right).

Proceed with the following instructions.

Level and lock the sensors.

When toe is within specifications, press "Ready."



Press "Ready" and the screen will display the special tool assembly for Toe Raised Vehicles with the following instructions.

Raise the front axle.

Pull up cylinder, insert and secure pin as shown.

Lower vehicle onto the special tool.

There are several extenders and adaptors that are used with the V.A.G special tool. The appropriate extender or adaptor will be indicated in accordance with the vehicle's specifications.

Extenders or Adaptors:

VAG 1925 = Special tool

VAG 1925/1 = A8 70mm extender

VAG 1925/2 = A8 18mm extender (used in most cases)

VAG 1925/3 = A4 105mm extender

VAG 1925/4 = A4 85mm extender (used in most cases)

VAG 1925/5 = A8 33mm adaptor (used for sport version)

VAG 1925/6 = A4 22mm adaptor (used for sport version)

NOTE: Using the pins to extend the cylinder upward inside the tool will allow the vehicle to rest at the correct height for raised toe measurements. The wheels themselves may or may not be resting partially on the turnplates.

Press "Ready" and the screen will display the following instructions.

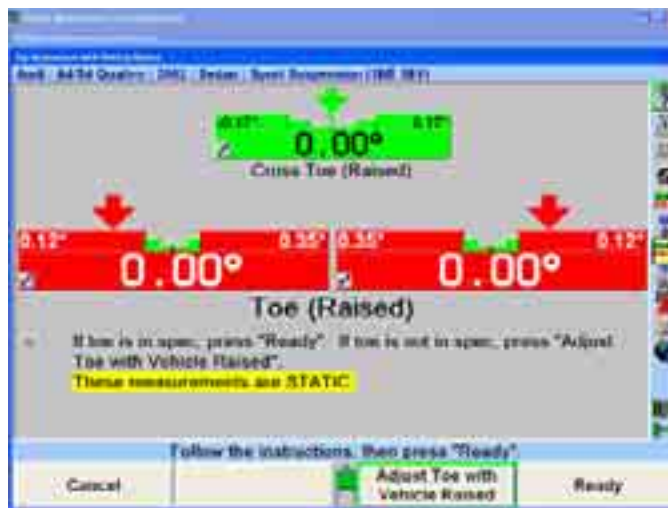
Raise the front axle.

Pull up cylinder, insert and secure pin as shown.

Lower vehicle onto the special tool.



Pressing "Ready" will display the "Toe Adjustment with Vehicle Raised" screen shown below. This screen is not an active screen, as the warning message in yellow will show.



Pressing "Adjust Toe with Vehicle Raised" will move the user to an active (adjustable) screen. Continue to adjust the vehicle to within specification.



Pressing “Ready” will display the screen below and the following instructions.

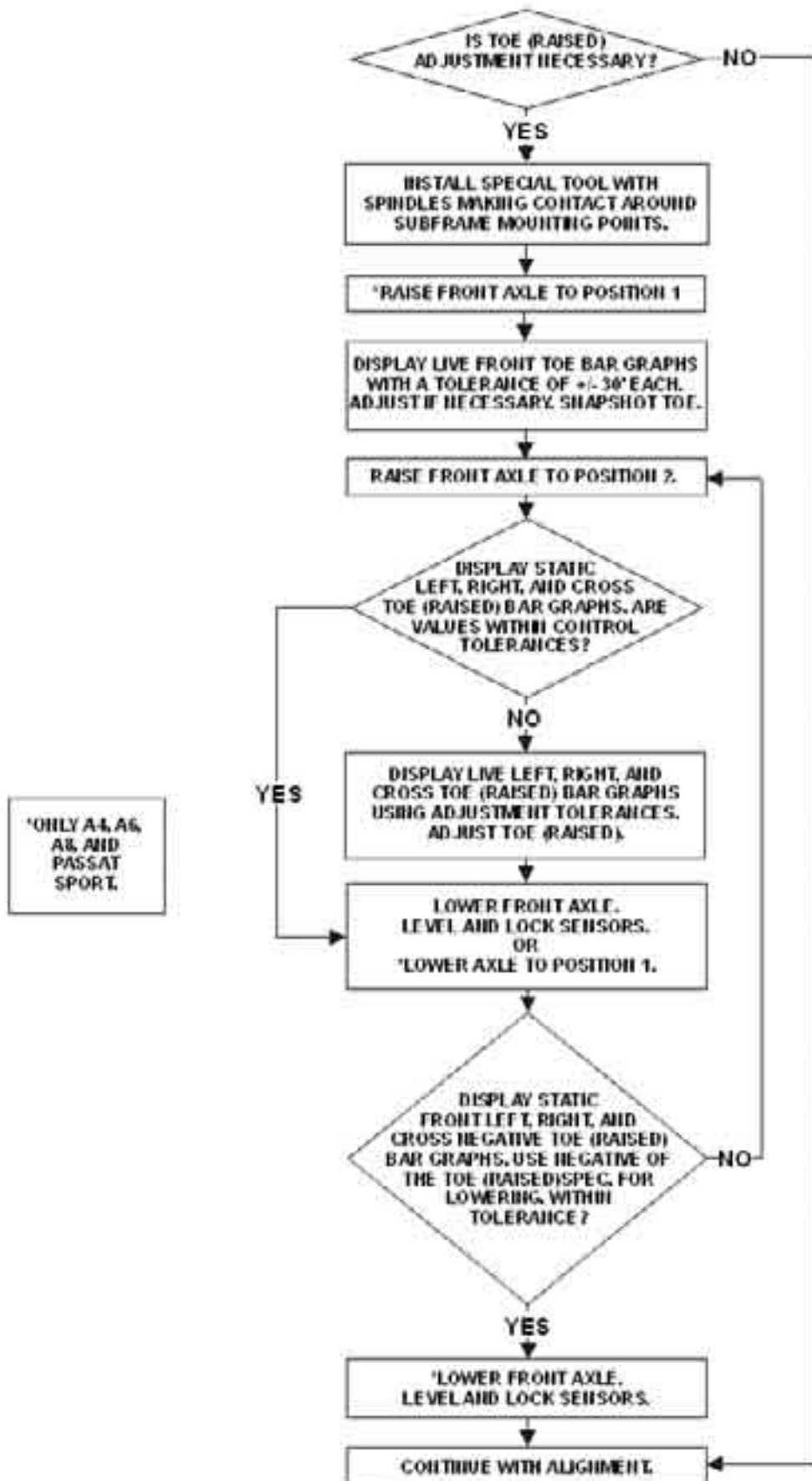
Lower the vehicle and jounce the axle.

Level and lock the sensors.



Pressing “Ready” will display the adjustments made. If adjustments are not within specification (negative or positive), move toe within specifications by repeating the procedures again through “Adjust Toe with Vehicle Raised” until vehicle acquires the required specification. The results of the adjustments can be viewed on the measurement screen or the printout.

V.A.G. Flowchart





Tire Information

Tire information entered in the “Edit Tire Information” popup screen will appear on the printout summary.

From the “Vehicle Measurements and Adjustments” screen, press “Make Additional Measurements” and the “Additional Measurement Procedures” popup screen will appear as shown below.



Press  or  to select “Tire Information” and press “OK.” The “Edit Tire Information” popup screen will appear as shown below.





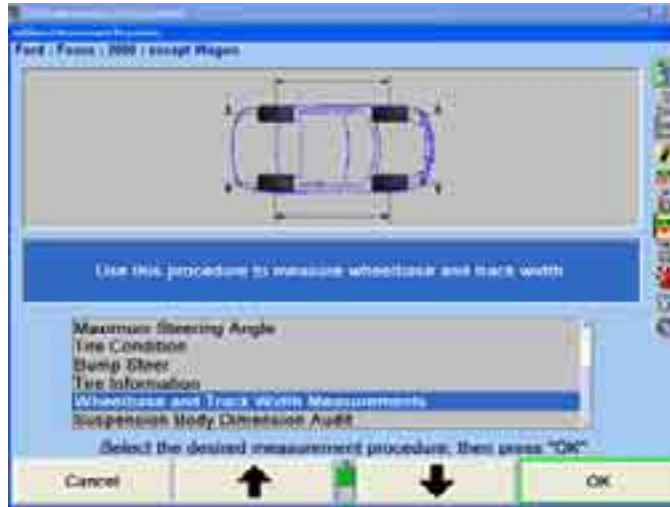
Use the keyboard to enter the appropriate data into the “Edit Tire Information” screen. This information will appear on the printout summary.

After the data has been entered, press “OK” to continue.

Wheelbase and Track Width Measurements

Wheelbase and track width measurements can be used to measure the wheelbase and track width of a vehicle.

From the “Make Additional Measurements” popup screen, press  or  to highlight “Wheelbase and Track Width Measurements.”



Select “OK.”

The “Rim Width and Adapter Type” popup screen will appear.

The front and rear rim widths should be measured with a caliper and entered into the rim width data boxes. If the rim width data is left blank, the track width will be an approximate measurement taken between the outside edges of the rims.

Select the adaptor type for the sensors being used.



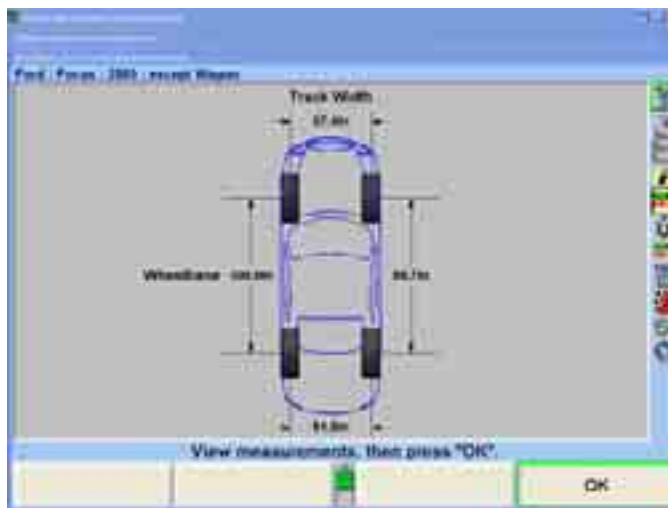
Select “OK.”

When the “Steer Ahead” popup screen appears, steer the wheels as directed.



Select “Ready.”

The “Wheelbase and Track Width Measurements” popup screen will appear, showing the wheelbase and track width of the vehicle.





Suspension Body Dimension Audit (SBDA)

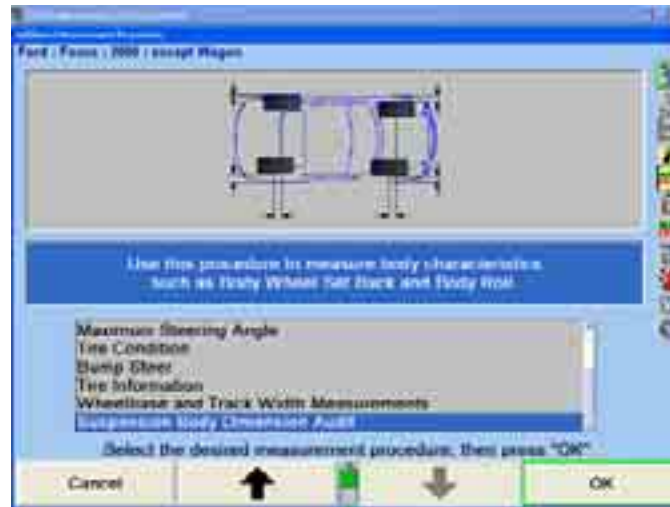
Suspension Body Dimension Audit (SBDA) is available only with DSP306/308 sensors equipped with the Ride Height option and body offset gauges. SBDA is available only if DSP306 or DSP308 sensors are used and selected in Aligner Setup.

NOTE: Improper steer-ahead, large values of runout or large values of toe can adversely affect SBDA measurements.

SBDA is a quick method of screening a vehicle to determine if it can be aligned before starting the alignment. SBDA can also be used as a quick inspection method to detect frame damage of vehicles that have been in minor collisions and will help the technician to determine that an alignment would not bring the vehicle within specifications.

Select “Make Additional Measurements” from the “Vehicle Measurements and Adjustments” primary screen.

From the “Additional Measurement Procedures” popup screen, press  or  to highlight “Suspension Body Dimension Audit.”



Select “OK.”

The “Rim Width and Adapter Type” popup screen will appear.



The front and rear rim widths should be measured with a caliper and entered into the rim width data boxes. If the rim width data is left blank, an alternate measurement called Track Width (Outside Rim) measured at the outside edges of the rims will be taken instead of Track Width.

Select the adaptor type for the sensors being used.

Select “OK.”

When the “Steer Ahead” popup screen appears, steer the wheels as directed.



Select “Ready.”

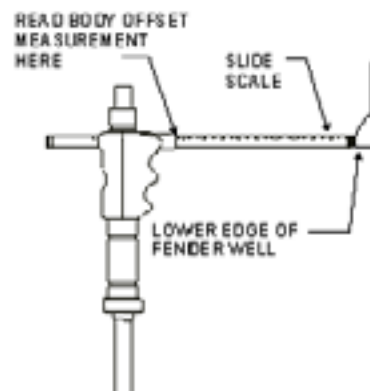
Enter the ride height dimensions using the ride height tool. Refer to “Ride Height.”



After measuring ride height at a wheel, lower the ride height tool slightly, pull the Body Offset Gauge (slide scale) of the tool back slightly, then raise and extend the Body Offset Gauge so that it is making contact with the lower outside edge of the fender well.

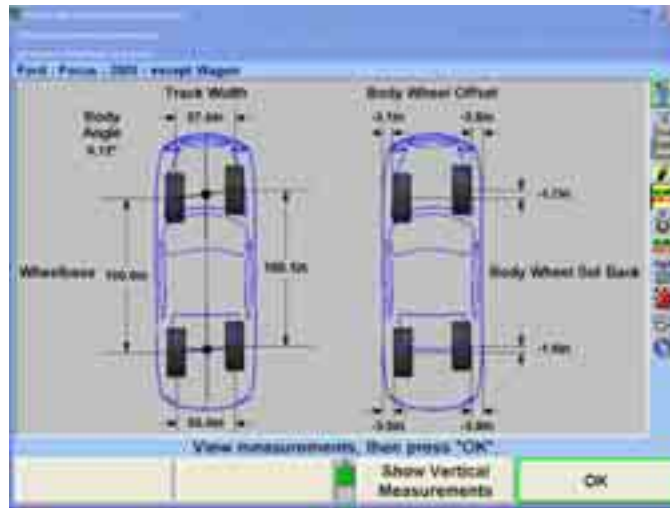
Enter the body offset measurements manually into the body offset data boxes. Repeat this step for each wheel. The preferred measurement procedure is to measure both wheels of one axle before proceeding to the next axle.

Care should be used to take the body offset measurements with the Body Offset Gauge perpendicular to the body and at the same contact point on the body for both sides of the axle.



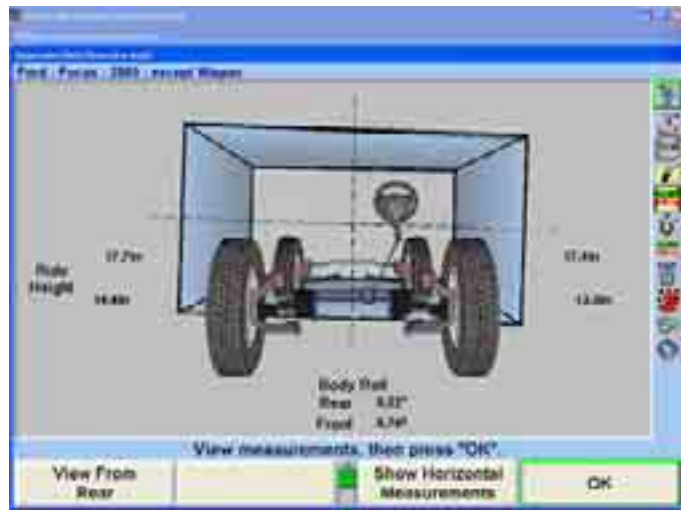
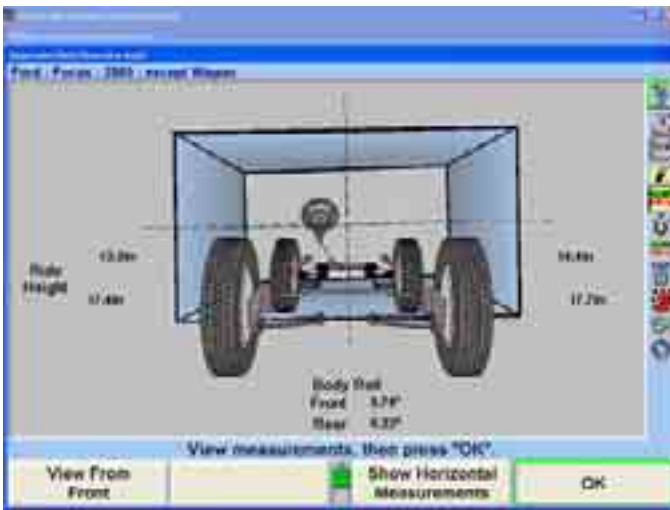
Select “OK.”

The “Suspension Body Dimension Audit” popup screen will appear with the wheelbase, track width, and body angles of the vehicle and on the right shows the body wheel offset and body wheel set back of the vehicle. The positions of the wheels and the body angle are exaggerated for clarity.



Selecting “Show Vertical Measurements” will present ride height and body roll measurements with a graphical depiction of the body that may be viewed from the front and the rear axle. The amount of roll is greatly exaggerated for clarity.

NOTE: All graphical measurement depictions are greatly exaggerated for clarity.



2.6 Illustrating Vehicle Adjustments


WinAlign® software contains illustrations for adjustments. These illustrations are drawings and photographic images of the Original Equipment Manufacturer’s method of adjustments. They also provide instructions or information necessary to make the adjustments.

To view illustrations:

Press “Illustrate Adjustments” on the “Vehicle Specifications” primary screen or the “Vehicle Measurements and Adjustments” primary screen. The screen will change to show an adjustment illustration for the vehicle. Any additional information required for the adjustment will also be shown.

Press “Next Illustration” or “Previous Illustration” to view additional illustrations.

Viewing images in “Illustrate Adjustments” defaults with text callouts applied to the image.

To view the image without the overlay text, use the menu shift softkey, , to locate and press the “Hide Text” softkey. The WinAlign® program will remove all text overlays for a clearer view of the vehicle’s image and illustration.

Pressing “Change Text Color” gives the option to view the callout text in a different color. If it is found that the text is difficult to read because of the image in the background, it is possible to change the color of the text for easier readability. The optional text colors are green (default), red, dark blue, yellow, light blue, and purple.

NOTE: Printouts of the photographic images and illustrations are useful only if using a color printer.



Press “OK” after viewing illustrations. The screen will return to the primary screen where “Illustrate Adjustments” was pressed.




Optional multimedia video instructions provide a live audio-visual demonstration of adjustments. To view video illustrations:

Press “Illustrate Adjustments” on the “Vehicle Specifications” primary screen or the “Vehicle Measurements and Adjustments” primary screen. The screen will change to show an adjustment illustration for the vehicle.

Press “Video Adjustments.” The “Video Adjustments” popup screen will appear listing various videos available.



Press  or  to highlight the desired video, and then press “Play Selection.”

Pressing  will pause the video, and  will restart the video after it has been paused. Pressing  will return you to the “Video Adjustments” menu screen.

After the video ends, you will be returned to the “Video Adjustments” screen.

2.7 Rear Adjustments

Rear Shims

Full contact shims can be used to adjust the camber and toe of the rear wheels of some vehicles. The shim is mounted between the hub/spindle assembly and the rear axle flange. The shim is tapered, which changes the angle between the spindle and the axle, thereby adjusting rear individual toe and/or camber.

▲ WARNING: Do not use a full contact shim on vehicles with rear disk brakes unless the brake caliper is mounted to the spindle backing plate, not to the axle assembly. The rotor and caliper must move together when installing a shim in the rear.



The “Adjustment Illustrations” popup screen will indicate if the rear shims are suitable for the current vehicle.

Using the Shim-Select® II Program

The Shim-Select® II program can provide assistance in determining the correct full-contact shim and the proper positioning of that shim for the required adjustments.

Press “Make Additional Adjustments,” on the “Vehicle Measurements and Adjustments” primary screen. The “Additional Adjustment Procedures” popup screen will appear.

If necessary, press “Select Rear Axle” to switch from the front to the rear axle. The available adjustments for the rear axle of the current vehicle are shown.

Press  or  to highlight “Adjust camber and toe with full contact shims” (this may be the only selection available), then press “OK.” The “Adjust Rear Shim (Shim-Select® II)” popup screen will appear.



The screen opens showing the shim requirements for the left rear wheel. Press “Show Right Shim” to toggle to the right wheel, and then “Show Left Shim” to toggle back to the left shim.

The current measurements for camber and toe are shown in the “Before” column at the upper left.

The “After” column at the upper left shows the residual errors that will remain in camber and toe after installing the shim. These residual values are shown in bar graph form so that the quality of the adjustments can be quickly gauged.

The shim required to make the changes is illustrated at the right. In the center of the shim is the size and orientation angle required.

The shim is shown in the actual size and color so that the display may be used as a template. If necessary, the shim display size can be adjusted by using WinAlign “Set Up.” A paper template may be obtained by pressing “Print Shim Template.”

Press “Freeze Measurements” to freeze the measurements shown in the “Before” column. The screen then displays “Measurements are frozen!” Freezing the measurements allows the sensors to be removed from the wheels while the display continues to show the shim requirements. Press “Unfreeze Measurements” to return the display to normal “live” operation.

The brand, color, part number, and bolt torque value are listed below the “Before” and “After” bar graphs. Several shim brands are supported. Select “Change Shim Brand” to view the supported brands.

NOTE:	The listed torque value may vary from the manufacturer’s recommendation. <i>Refer to the manufacturer’s service manual for the exact torque value.</i>
--------------	--

When the adjustments are complete, press “OK” to return to the “Vehicle Measurements and Adjustments” primary screen.

Using Non-adjustable 1-Piece Shims

Non-adjustable shims are available with tapers in fixed increments. “Shim-Select® II” will normally pick the correct taper and orientation to provide the best adjustments possible. For example, a shim with a 1/4 degree taper at an orientation angle of 63 degrees might be recommended.

The procedure for using this shim type is as follows:

Use the screen as a template or print a paper template. Place the shim over the template and orient it such that it matches the template.

Mark the top of the shim.

Remove any segments or cutouts necessary to clear the mounting bolts or other parts of the vehicle.

Install the shim with the top mark up.

Tighten the bolts carefully to the required torque.

These shims almost never adjust both camber and toe perfectly, and often require a compromise between camber and toe adjustments. The bar graphs in the “After” column show the quality of the adjustments provided by the indicated shim by showing the residual errors for camber and toe. For example, camber might show an “after” residual error of 0.05 degrees with toe showing 0.01 degrees.

To improve camber at the expense of toe, press “Improve Camber.” To improve toe at the expense of camber, press “Improve Toe.” The “scroll bar” at the left of the bar graphs shows how the residual errors are divided between toe and camber. If a “pointing device” (a mouse or a light pen) is available, the scroll bar can be moved directly with it. Using this method, the recommended shim can be “fine tuned” as desired.

NOTE:	The adjustments of the left shim can be fine-tuned independently of the adjustments of the right shim.
--------------	--

For Full Contact/Dual Angle Shims (Original Hunter/Northstar Design)

Print template for shim, select proper shim part number under “Part Number” heading. Place shim over template with serrations up and notch indexed to the location shown as a black arrow.

Using a marker pen, place a mark at the 12 o'clock position on the shim. Mark the tabs that need to be cut out, shown in gray on the template.

Using Hunter’s special cutter, 88-343, or other suitable cutting tool, nip the slots at the ends of the tabs to be removed, cutting 1/8 inch or less. Next, grab the ends of the tabs with the tool and bend downward to break the tabs out.

Remove spindle/hub assembly, clean mating surfaces, install the shim, keeping the 12 o'clock reference mark to the top and the serrations facing you.

Install and torque the mounting bolts to the specification listed on the printout.

NOTE:	Hunter Engineering Company does not recommend stacking shims.
-------	---

Using Adjustable 2-Piece Shims

Several shim brands are supported. Press “Change Shim Brand” to show the next brand.

Adjustable shims are two-piece shims that can be rotated, one relative to the other, such that the shim has the correct taper. The entire shim is then rotated to the correct orientation angle and installed. Such shims normally provide “perfect” adjustments, provided the changes required are not so large that the shim cannot provide enough change.



The procedure for using this shim type is as follows:

Use the screen as a template or print a paper template. Place the shim over the template and orient it such that it matches the template.

Mark the top of the shim.

Remove any segments or cutouts necessary to clear the mounting bolts or other parts of the vehicle.

Install the shim with the top mark up.

Tighten the bolts carefully to the required torque.

When this shim brand is used, the “Improve Camber” and “Improve Toe” softkeys are not available, since they are not needed. The scroll bar that is used to improve the camber and/or toe fit is not shown.

When using the Hunter 2000 shims, if the changes required are beyond the range of the shim, it is shown adjusted to its maximum taper and is then treated as a non-adjustable shim. In this case, the “Improve Camber” and “Improve Toe” softkeys reappear, as does the scroll bar.

For System “2000” Hunter/Northstar Shims

Print template and place shim over template with System “2000” logo facing up and shim pointers indexed at the white arrows on the outside of the shim on the template (either arrow can be to either mark), or make sure the serrations on top and bottom line up perfectly with each other.

Using a marker pen, place a mark at the 12 o'clock position on the shim. Mark the tabs that need to be cut out, shown in gray on the template.

Using Hunter’s special cutter, 88-343, or other suitable cutting tool, nip the slots at the ends of the tabs to be removed, cutting 1/8 inch or less. Next, grab the ends of the tabs with the tool and bend downward to break the tabs out.

Remove spindle/hub assembly, clean mating surfaces, install the shim, keeping the 12 o'clock reference mark to the top and the System “2000” logo facing you.

Install and torque the mounting bolts to the specification listed on the printout.

NOTE:	Hunter Engineering Company does not recommend stacking shims.
-------	---

Overriding the Recommended Shim

The recommended shim taper and the orientation angle can be overridden only if the aligner has a mouse or a light pen. Override is controlled as follows:

A click with the cursor in the bottom half of the center of the shim overrides the shim taper to select the next lower taper. For example, if a 1/2 degree shim is shown and the next lower taper is 1/4degree, a single click selects a 1/4degree shim.

A click with the cursor in the top half of the center of the shim overrides the shim taper to select the next higher taper. For example, if a 1/2degree shim is shown and the next higher taper is 3/4 degree, a double click selects a 3/4 degree shim.

Press and hold the left mouse button with the cursor outside the center of the shim to change the orientation angle of the shim. “Drag” the cursor, as if you are trying to rotate the shim, until the shim is oriented to the desired angle, then release the button.

NOTE:	When using the Hunter 2000 shim, if the required correction causes the shim to appear as a non-adjustable shim, then the shim is oriented to provide the best possible correction. In this case, the “size” cannot be altered, but the orientation angle can be changed as for a 1-piece shim.
-------	--

When the shim computations are overridden in this manner, a softkey labeled “Compute Shim Automatically” appears. Press this key to remove the override and allow Shim-Select to compute the required shim.

The display continuously shows the residual errors or “after” adjustments that result from installing the indicated shim, so that the quality of the adjustment is known immediately.

NOTE:	The left shim can be overridden independently of the right shim. If desired, one can be overridden while the other is computed automatically.
-------	---

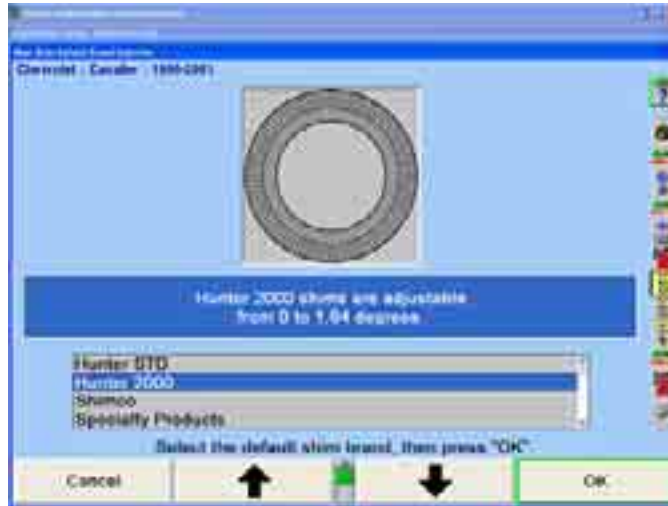
Adjusting the Shim Display Size



The display can be adjusted such that the shim appears life-sized. Refer to “Aligner Set Up.”

Selecting the Default Shim Brand

The shim brand can be changed at any time by selecting “Change Shim Brand.” The change remains in effect until the system is reset, at which time the brand changes to the “default shim brand.”

To change the default shim brand, select “Select Shim Brand.” The “Rear Shim Default Brand Selection” popup screen appears.



Use  or  as necessary to highlight the desired shim brand, then select “OK.” The current shim selection changes to the new default, and the new default brand will be chosen when the system is reset.

Setting Up Rear Shims

The “Rear Shim Default Brand Selection” popup screen is available from aligner setup.

Contacting Shim Manufacturers

For help with Hunter shims, call toll-free 1-800-828-0255.

For help with Shimco shims, call toll-free 1-800-525-6505.



For help with Specialty Product shims, call toll-free 1-800-525-6505.

2.8 Front Adjustments

WinAlign® specific front adjustment features include: vehicle-specific front shim adjustments, CAMM®-Control Arm Movement Monitor, WinToe® toe adjustment feature, and ABC-Automatic Bushing Calculator.

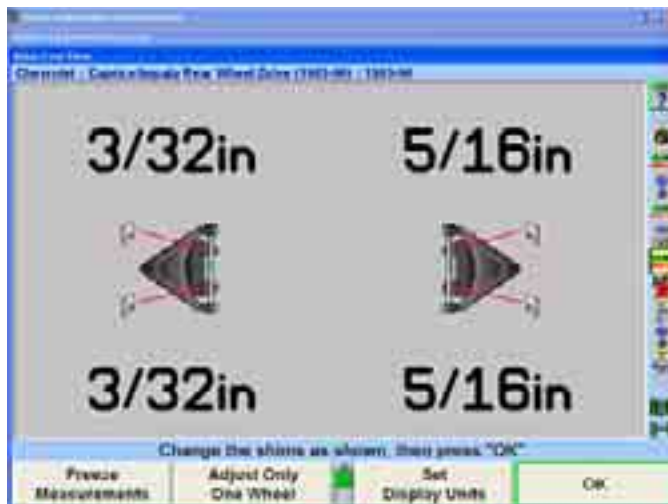
Front Shims

Press “Make Additional Adjustments” on the “Vehicle Measurements and Adjustments” primary screen. This “Additional Adjustments” popup screen will appear.

Press  or  to highlight “Adjust camber and caster with shims.”



Press “OK.” This “Adjust Front Shims” popup screen will appear.



Some vehicles with SLA-type (short/long arm) suspensions have shims placed between the vehicle frame and the pivot arm of the upper control arm. Placing the correct amount of shims at each pivot arm mounting point simultaneously adjusts both camber and caster of the wheel. It is difficult to compute the required shim changes, especially when the upper control arm is not symmetric. The specification database includes information that allows the system to correctly compute the shim changes required, even for non-symmetric upper control arms.

NOTE:

The caster angle is a “live value” that is continuously updated as changes occur to the caster angle during adjustment. At the beginning of the procedure, install brake depressor, then level and lock the sensors.

The procedure for making the shim adjustments is as follows:

Measure the caster, then popup the “Adjust Front Shims” screen.

Steer straight ahead, install brake depressor, then level and lock the sensors.

Observe the required shim changes as shown on the screen. A negative number means that the indicated shim thickness must be removed from the corresponding position, while a positive number indicates that the shim thickness must be added.

If desired, press “Freeze Measurements.” The screen then displays “Measurements are frozen!” and “freezes” the required shim changes. Freezing the measurements allows the sensors to be removed from the wheels while the display continues to show the shim requirements, and to unbolt the pivot arm to change the shims without losing the display or required changes. Press “Unfreeze Measurements” to return the display to normal “live” operation.

Press “OK” when adjustments are complete. The “Vehicle Measurements and Adjustments” primary screen will appear.

One-Sided Adjustments

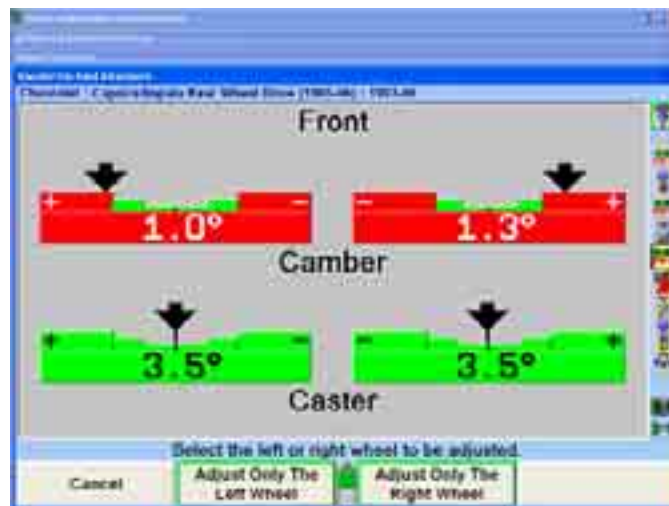
Sometimes it is preferable to adjust camber and caster of only one wheel. For example:

If the camber and caster of one wheel are within tolerances but not exactly on specification, it may be acceptable to leave those measurements unchanged.

If the camber and caster adjustments on one wheel do not have sufficient range to allow adjustment exactly to specification, you may have to accept what adjustment is possible.

In such cases, it is important that the camber and caster adjustments be symmetric side-to-side. The system allows you to adjust camber and caster of one wheel to match the camber and caster measurements of the other wheel, thereby achieving symmetric measurements, even if those measurements are not on the specification.

Press “Adjust Only One Wheel.” The “Snapshot One-Sided Adjustments” popup screen will appear, as shown below.



If you wish to adjust the left wheel and leave the right wheel unadjusted, press “Adjust Only The Left Wheel.”

OR

If you wish to adjust the right wheel and leave the left wheel unadjusted, press “Adjust Only The Right Wheel.”

NOTE: You can adjust one wheel to its’ optimum adjustment, then press “Adjust Only One Side” to optimize the other wheel.



When the camber and caster measurements are stable on the wheel that will remain unadjusted, the system will save those measurements to be used as the targets for adjusting the other wheel. The “Adjust Front Shims” popup screen will appear.

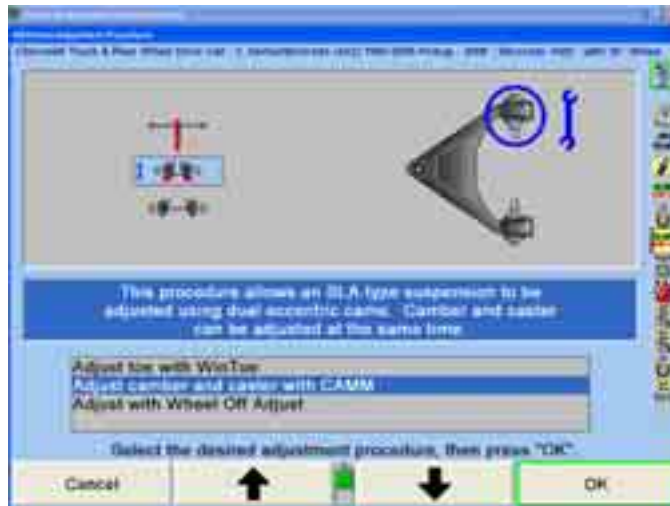
The prompt will instruct you to change the shims only on the wheel to be adjusted. The shim changes shown for the wheel are the adjustments required to make the camber and caster of that wheel match the camber and caster of the other wheel.

To return to adjusting both wheels, press “Adjust Both Wheels.”

NOTE: You may “Freeze Measurements” either before or after pressing “Adjust Only One Wheel.”

CAMM® (Control Arm Movement Monitor) for Front Cams and Slots

Press “Make Additional Adjustments” on the “Vehicle Measurements and Adjustments” primary screen. The “Additional Adjustment Procedures” popup screen will appear, as shown below. Press  or  to highlight the adjustment procedure for cams or slots.



CAMM is also available as a drop-down selection from the measurements screen, or as part of the ExpressAlign procedure.



The “Adjust Front Cams and Slots” popup screen will appear, as shown below. If ExpressAlign® has been enabled the screen will appear automatically.



Press “Jack Up Front Wheels” to adjust with the wheels off the rack. The “Axle Jacking Procedure” popup screen will appear.

Raise the selected axle and press “Ready.” The program will compensate for the difference in sensor readings caused by raising the wheels.

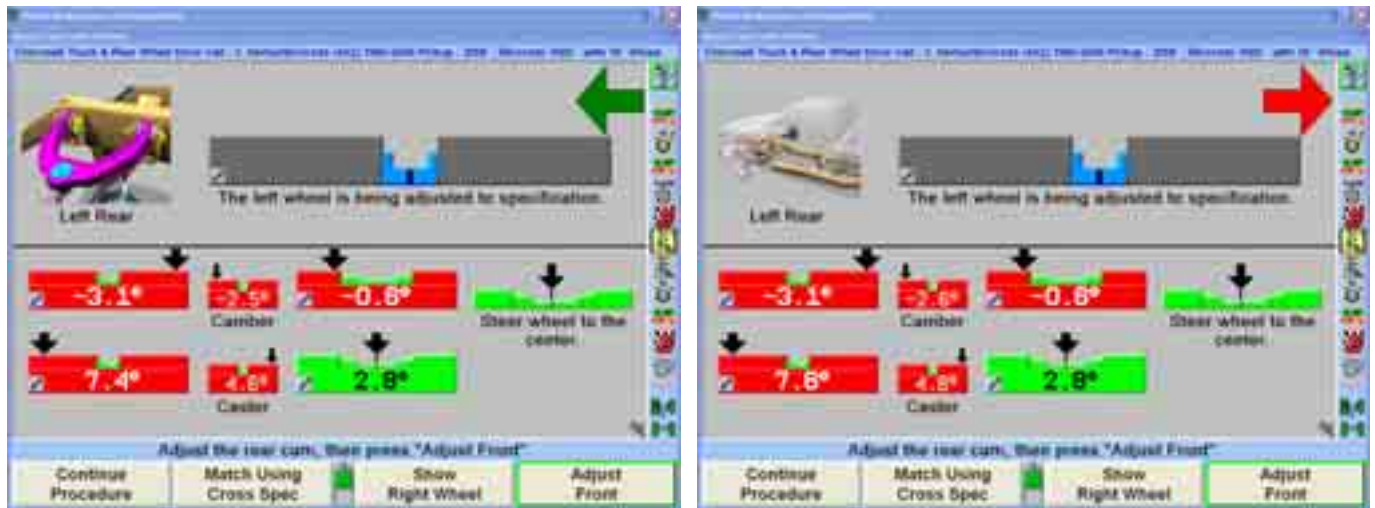
OR

Press “Adjust On Turnplates” to make adjustments without raising the vehicle.

The “Adjust Front Cams and Slots” popup screen will appear, as shown below. CAMM® will determine the cam or slot that should be adjusted first (front or rear).

Caster and camber bar graphs can also be displayed by selecting “Show Bar Graphs.” The bar graphs should be used for reference only. Actual adjustments should be made using the *blue* CAMM® bar graphs.

When adjustments have begun, an arrow appears indicating the direction the control arm is being moved. A green arrow will point toward the center of the graph if adjustments are being made correctly, or a red arrow will appear if adjustments are moving away from the center of the graph.

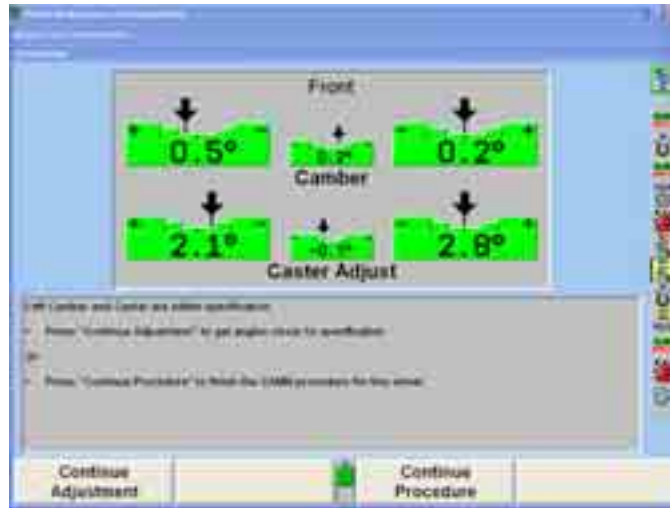


Adjust the front cam or slot until the arrow is in the center of the bar graph. As the adjustments are made the indicator will move to the center of the bar graph and the bar graph will turn from *gray* to *blue*.



In the example above the rear cam is adjusted first. When the bar graph has turned blue, tighten the cam, then select "Adjust Front" to adjust the front cam. Each time the aligner will re-analyze the changes required before switching to the other cam or slot and showing the bar graph.

Continue making adjustments as directed. When the adjustment has moved camber and caster to within specs for that particular wheel a popup screen notifying the technician that no more adjustments are required will appear.



Select “Continue Procedure” to move on to the next step in the alignment procedure. If the other wheel still requires adjustment the program will automatically switch to that wheel. Make the adjustments to that wheel as directed above.

If at any time the steering wheel is moved away from center, a bar graph will appear with the steering wheel’s current position and the note “Steer wheel to the center.” Correct the steering condition and continue with the procedure.



Select “Match Using Cross Spec” to have CAMM[®] add the correct amount of difference the vehicle manufacturer recommends. An example of this would be:

- Caster spec left: 4.0 degrees
- Caster spec right: 5.0 degrees
- Actual Left Caster: 3.7
- Actual Right Caster: 1.2

If the technician is adjusting the right side of the vehicle using “Match Using Cross Spec,” right caster will be adjusted to 4.7 degrees. If the left and right spec for camber or caster is different, it will add or subtract the correct amount. If there is not a difference, it will match them exactly.

Select “Lower Wheels and Finish” when all adjustments are completed.

WINTOE® Toe Adjustment System



WINTOE® is a software feature that allows the adjustment of front toe on vehicles with an independent tie rod adjustment for each wheel. Using WINTOE® will provide the desired toe settings for each wheel and insure the desired steering wheel position, normally without the need to readjust or touch up settings. Additionally, WINTOE® eliminates the need to lock the steering wheel during toe adjustments.

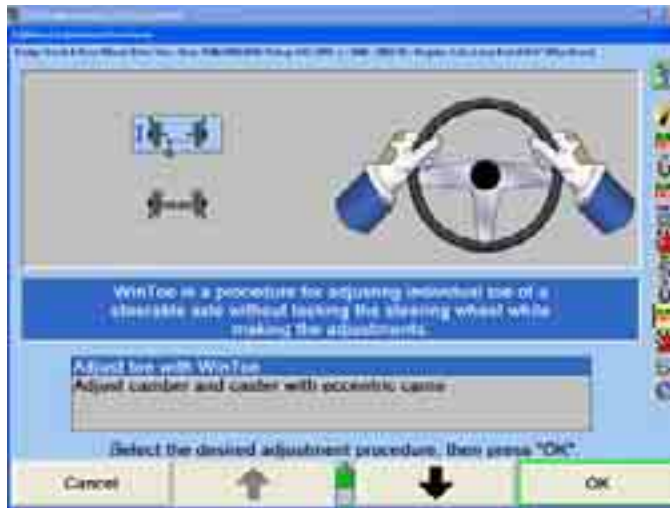
There are a few special cases in which a different WINTOE® procedure will be used to adjust front toe:

- a) Vehicles with single tie rod and no adjustable draglink
- b) Vehicles with relay rod and adjustable draglink

To access WINTOE® directly from the front bar graphs, press and hold the light pen or the left mouse button on either the left or right toe bar graph, then highlight “Adjust Toe with WINTOE®” from the pull-down menu and release.

OR

Press  or  to highlight “Adjust Toe with WINTOE®” under the “Make Additional Adjustments” secondary screen. The “WINTOE®” popup screen will appear prompting to level the steering wheel in the straight-ahead position as indicated.



For vehicles with power steering, place the transmission in park or neutral, install brake depressor, and make sure the wheels are chocked, start the engine and level the steering wheel.

Steering wheel leveling is important. While sitting in the driver's seat, rock the steering wheel back and forth in arcs left and right from the level position. The arcing motion should start out with larger arcs and gradually become smaller arcs with the result being to have the steering wheel be precisely leveled while ensuring that the steering system is carefully positioned in the mid-point of any gear lash and power steering valve movement.

Use chalk to mark the leveled steering wheel position with the side of the steering column. This easy to see reference mark will save time in final adjustment verification.



Select "Show Toe Bar Graphs" to exit the Virtual View WinToe.

With the steering wheel centered, turn the engine off and exit the vehicle, being careful to not touch or bump the wheel position. IT IS NOT NECESSARY TO LOCK THE STEERING WHEEL. (Does not apply to the two special cases in which a different WINTOE[®] procedure will be used to adjust front toe.)

While being careful to not disturb the position of any wheels or steering linkage, level and lock all four wheel sensors.

<p>IMPORTANT: Before locking the adjustment, lightly jounce the front end to verify the "relaxed" position. Lock the adjustment and lightly re-jounce the suspension to verify adjustment. As long as the bar graph remains green, with the adjustment locked, you can proceed. The value does not have to read zero. To prevent incorrect adjustments, WINTOE[®] does not allow the operator to proceed unless the locked adjustment is green.</p>

Follow the on-screen instructions and press "Ready."

This will allow WINTOE[®] to "memorize" each front wheel's position and needed tie rod adjustments relative to the desired steering wheel position. Keep in mind, the WINTOE[®] feature's memory will track the needed adjustments for each wheel, even if the steering moves or gets jarred during the adjustment process. As long as the wheels are within approximately two degrees left or right from straight ahead, WINTOE[®] automatically compensates for any movement in the steering system and continues to accurately monitor the adjustments.

The screen will change to display a bar graph prompting to adjust the right toe.



Adjust right tie rod until toe is zero. Jounce the front axle. Readjust the right tie rod if necessary. Equalize all rotational movement in the joints by making sure that each ball and socket joint in the steering linkage can be rotated in either direction the same distance.

Lock the adjustment, then lightly jounce the front end again to verify the adjustment. As long as the bar graph remains green, with the adjustment locked, you may proceed. The value does not have to read zero, but the bar graph must be green.

NOTE:	To prevent incorrect adjustments, WINTOE® prevents the operator to proceed unless the locked adjustment is green.
-------	---



After the right side adjustment is completed and locked, pressing “Ready” will display a bar graph prompting to adjust the left toe.



Adjust left tie rod until toe is zero. Jounce the front axle. Readjust the left tie rod if necessary.

Equalize all rotational movement in the joints.

Lock the adjustment, and then lightly jounce the front end again to verify the adjustment. As long as the bar graph remains green with the adjustment locked, you may proceed. The value does not have to read zero, however, the bar graph must be green.



Press “Ready.” The screen will change to display one bar graph.

To verify steering wheel position, steer straight ahead. The arrow should be centered on the bar graph and the steering wheel level. Restart WINTOE[®] if the steering wheel is not level.



NOTE: For vehicles with power steering, start the engine, and with a slight rocking motion of the steering wheel, steer the arrow on the bar graph to the center. Observe the final steering wheel position.

NOTE: You may also use the reference chalk marks, if used earlier, to index the level steering wheel position.



After verification of steering wheel position, the on-screen instructions will prompt you to press "Ready." This will complete the WINTOE[®] procedure by returning to the primary "Vehicle Measurements and Adjustments" screen.

Automatic Bushing Calculator[®] Adjustment Feature

Automatic Bushing Calculator[®] (ABC) provides assistance in determining the correct bushing size and proper positioning for the required adjustments.

NOTE: Do NOT remove bushings until instructed to do so. The illustrated blue arrow depicts the center of the thin wall. This is NOT the bushing crush gap.

Press "Make Additional Adjustments," on the "Vehicle Measurements and Adjustments" primary screen.


The “Additional Adjustment Procedures” popup screen will appear. Press  or  to highlight “Adjust camber/caster with bushings.”



Press “OK.”

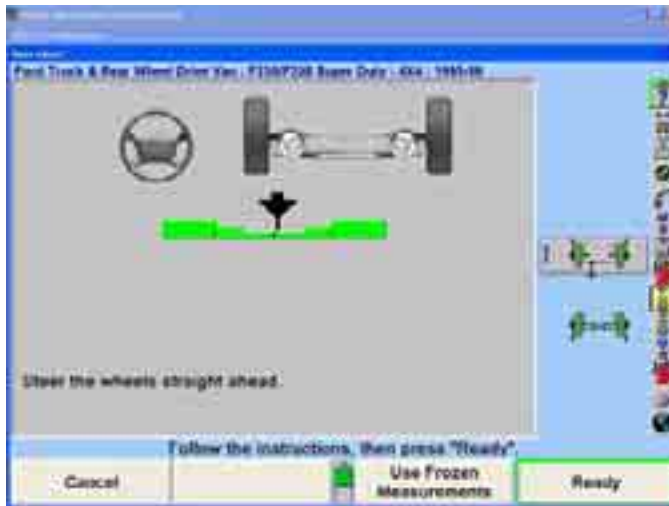
OR

Select “Adjust with Automatic Bushing Calculator” from the context sensitive menu.

In the left lower corner of each applicable bar graph, there will be a bushing icon, , to indicate that the Automatic Bushing Calculator[®] is available.



If the “Steer Ahead” popup screen appears, steer the wheels straight ahead.





Press “Ready.” Measurements will automatically be frozen.

Do not remove the bushing.



The screen then displays “Measurements are frozen!” Freezing the measurements allows the sensors to be removed from the wheels while the display continues to show the bushing requirements. Press “Unfreeze Measurements” to return the display to normal “live” operation.

Identify and enter the shape of the current bushing by pressing “Tab” and  or  to highlight the desired choice or using the mouse or lightpen.

Record the current position of the bushing into the computer.

NOTE: The illustrated blue arrow depicts the center of the thin wall. This is NOT the bushing crush gap.

Adjust the blue arrow to the center of the thin wall on the illustrated bushing.

OR

Enter the data manually by pressing “Tab” to highlight the “Position of Current Bushing” data box and entering the degrees using the illustrated bushing as a reference for direction.

Identify the size of the current bushing by looking at the stamped size on the side of the bushing and enter the size into the “Size of Current Bushing” data box.

NOTE: ABC accepts bushing size values in both decimal degrees and fractional degrees. If the bushing is stamped in degrees and minutes (example 1°30’), you should convert the value to degrees before you enter it.

<i>DEGREES AND MINUTES =</i>	<i>DEGREES</i>
0°15’	.25°
0°30’	.50°
0°45’	.75°
1°00’	1.00°
1°15’	1.25°
1°30’	1.50°
1°45’	1.75°
2°00’	2.00°

After you have finished entering the existing bushing information, press “OK.”

The “Adjust Front Bushings” popup screen will appear. The screen opens showing the bushing requirements for the left wheel. Press “Show Right Bushing” to toggle to the right wheel, and then “Show Left Bushing” to toggle back.



Before removing the bushing, mark a reference line on the bushing that indicates the “front” orientation of the bushing in its current position. Remove the bushing.

This screen will display the existing bushing information and the required adjustment bushing information. The currently measured camber and caster are shown in the “Before” column at the upper left.

The “After” column shows the residual errors that will remain in camber and caster after installing the bushing. These residual values are shown in bar graph form so that the quality of the adjustments can be quickly gauged.

The size, installation position, brand and part number for the required bushing will be displayed in the lower lefthand corner of the screen.



The size and position of the required bushing are computed for optimum adjustment, but may be manually overridden by the technician by either selecting the adjustment arrows to the right of the numbers, or by moving the blue arrow to the new placement of the thinwall of the bushing.

Initially the computer considers both readings to have equal importance, but the scroll bar to the right of the camber and caster readings allows the technician to prioritize the need for either camber or caster adjustment as more or less important. “Improve Camber” and “Improve Caster” can also be selected to move the scroll bar. For instance, scrolling toward caster increases the importance of caster adjustment and decreases the importance of the camber adjustment. The bushing will be changed accordingly.

Selecting “Change Bushing Brand” will change the bushing manufacturer to the next manufacturer available.

Selecting “Print Bushing and Template” will print the template of the bushing that can be helpful in placement of the bushing. The bushing is shown in the actual size so that the display may be used as a template.



Selecting “Select Bushing Brand” will present the technician with a list of bushing brands. The desired manufacturer can be selected by pressing  or  to highlight the manufacturer and selecting “OK.”



When used with ExpressAlign® the Alignment Bushing Calculator® allows for one wheel to be adjusted when the opposite wheel is within specification. When this situation occurs, the popup screen will provide you with a list of options that will allow you to select “Adjust Only One Wheel,” “Adjust Both Wheels,” or “Adjust to Actual Value.”



Selecting “Adjust Only One Wheel” when the left wheel is out of specification will set the specification for the left wheel to right value + cross spec. If the right side were out of specification, then right wheel would be set to left value - cross spec.

To adjust both wheels using ABC® with ExpressAlign®:

Adjust the left wheel first. After adjusting the left wheel, press “OK.” WinAlign will display the steer ahead screen again. This time, K3 will read “Use Frozen Measurements.”

Press “Use Frozen Measurements” to bypass the steer ahead screen and use the previously frozen measurements. This prevents the user from having to re-mount the wheel and sensors, lower and jounce the vehicle, re-compensate the sensors, and steer ahead to re-freeze the measurements.


When all adjustments are completed, press “OK” to return to the “Vehicle Measurements and Adjustments” primary screen. After adjusting camber and/or caster using ABC®, lower and jounce the vehicle, then re-compensate the sensors.

2.9 Print Selections

Access the print selections from the “Vehicle Specifications” or the “Vehicle Measurements and Adjustments” primary screens. This screen will also be available at the end of the alignment process.

Soft Key Panel			
Cancel	Print Symptom Report	Print Vehicle	Print Summary
Print Specifications	Print Measurements	Print Bar Graphs	
Set up Printer	Set Advertising Message	Edit Customer ID	Set Steering Wheel Status
Print Vehicle Before and Current	Enable Print Preview		Help

The printer can also be set up from this screen.

The printer can also be set up by pressing the printer icon  on the Procedure Bar.

A note can be added to the printout by typing a message on this screen in the space provided, as shown below.

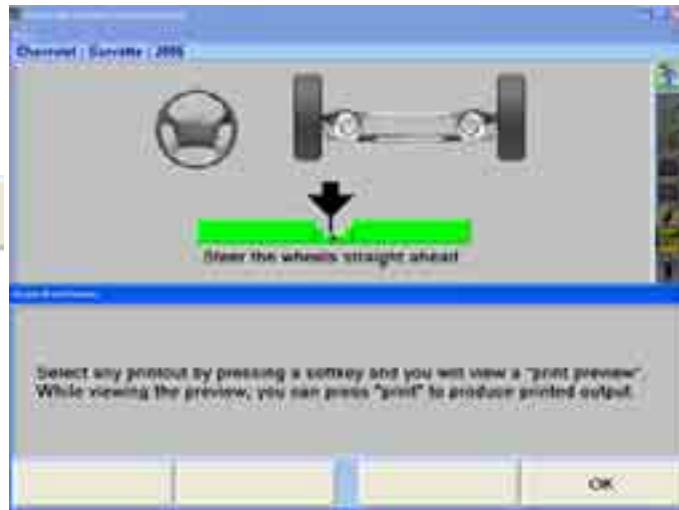


Print Preview Feature

Print Preview allows the user to view an image of the printout before it's printed. Print Preview can be enabled in Setup or from any "Print" screen. Print Preview can be enabled or disabled prior to any printing.

Select "Enable Print Preview" from the lower tier of softkeys. The "Enable Print Preview" popup will appear. Select "OK" to enable.

Enable Print Preview

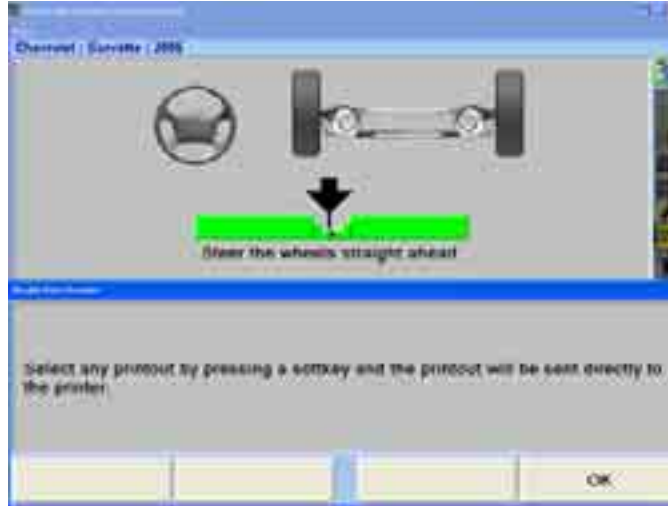


Once Print Preview has been enabled an image of the printout will appear in the WinAlign frame.



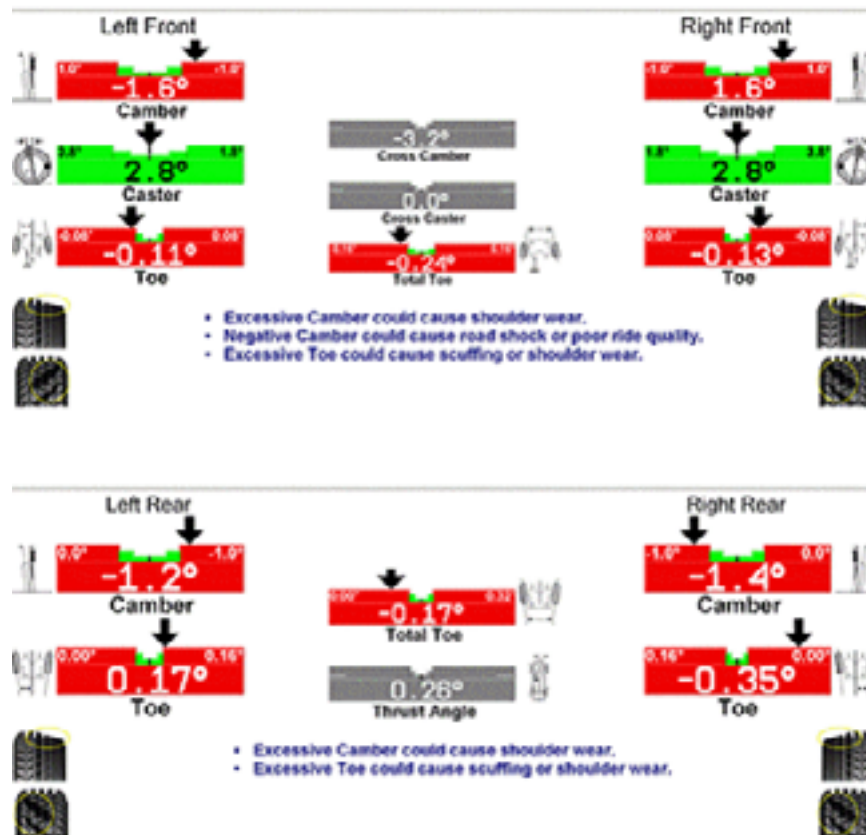
Select "Cancel" to cancel the print job. Use the "Zoom In" or "Zoom Out" to view the entire image or for greater detail. Select "Print" to print out the desired format. On the next level of softkeys select "Continue" to proceed with the alignment process. Select "Disable Print Preview" to print directly to the printer. "Setup Print Language" changes the print language.

To disable print preview select "Disable Print Preview" from the Print screen. Select "OK" on the "Disable Print Preview" popup screen. Print Preview images will no longer appear until it has been re-enabled.



Print Symptom Report


After measurements have been taken, a Symptom Report of the current alignment conditions can be printed. The printout will display the current readings of the main alignment angles and will describe how the condition will affect handling and illustrate how it will affect tire wear.

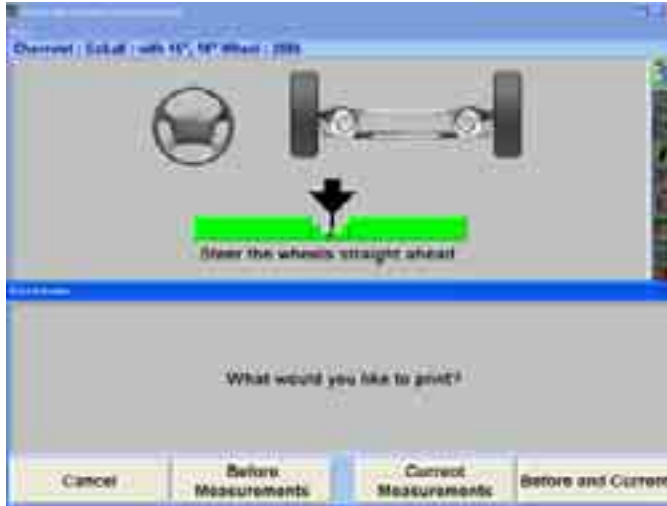


Printing the Vehicle

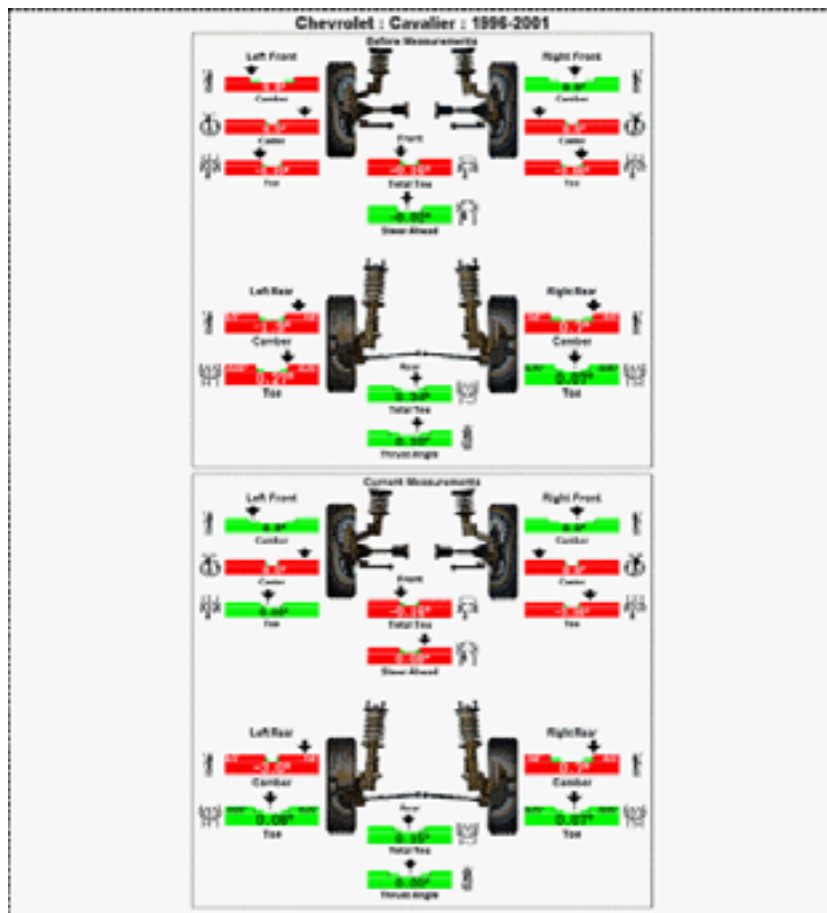
When selecting “Print Vehicle” a second dialog box will open with the options “Before Measurements,” “Current Measurements,” or “Before and Current.” These selections can be accessed from the “Vehicle Specifications” or “Measurements and Adjustments screens.”

Or

The options can be selected by pressing the printer icon  on the Procedure Bar.



Selecting any of these options will produce a printout that will display the bar graphs of the measurements taken during the alignment process, with the specified readings and the specifications.



Print Summary

“Print Summary” is a standard text only printout, depicting the ‘Before’ and ‘Actual’ alignment readings for all the specific measurements taken. Readings in bold print are out of manufacturer’s tolerance.

Name Joe Customer
 Address 1 Main
 St. Louis, MO 63044
 Telephone 314-555-5555
 Vehicle (VIN)
 License ABC-123
 Color Yellow
 Year: 02
 Technician Roy
 Mileage 12000
 Time Printed 2/20/03 11:38 AM

Honda : Accord : 1998-2002

Front : Left			Camber Caster Toe SAI Included Angle Turning Angle Diff.	Front : Right		
Actual	Before	Specified Range		Actual	Before	Specified Range
-0.6°	-1.6°*	-1.0° 1.0°	0.2°	1.6°*	-1.0° 1.0°	
2.8°	2.8°	1.8° 3.8°	2.8°	2.8°	1.8° 3.8°	
-0.01°	-0.11°*	-0.08° 0.08°	0.00°	-0.13°*	-0.08° 0.08°	
0.6°	0.6°		0.0°	-1.5°*		
-0.6°	-1.1°		0.2°	0.1°		
		-8.45° -6.45°			-8.45° -6.45°	

Cross Camber Cross Caster Total Toe	Front		
	Actual	Before	Specified Range
	-0.7°	-3.2°	
	0.0°	0.0°	
	-0.01°	-0.24°*	-0.16° 0.16°

Rear : Left			Camber Toe	Rear : Right		
Actual	Before	Specified Range		Actual	Before	Specified Range
-0.6°	-1.2°*	-1.0° 0.0°	-0.7°	-1.4°*	-1.0° 0.0°	
0.08°	0.17°*	0.00° 0.16°	0.09°	-0.35°*	0.00° 0.16°	

Total Toe Thrust Angle	Rear		
	Actual	Before	Specified Range
	0.17°	-0.17°*	0.00° 0.32°
	0.00°	0.26°	

Print Specifications and Print Measurements

Selecting “Print Specifications” or “Print Measurements” from the “Vehicle Specifications” or “Measurements and Adjustments screens” will print text only lists of all specifications available for the vehicle, or the current readings with the specifications included.

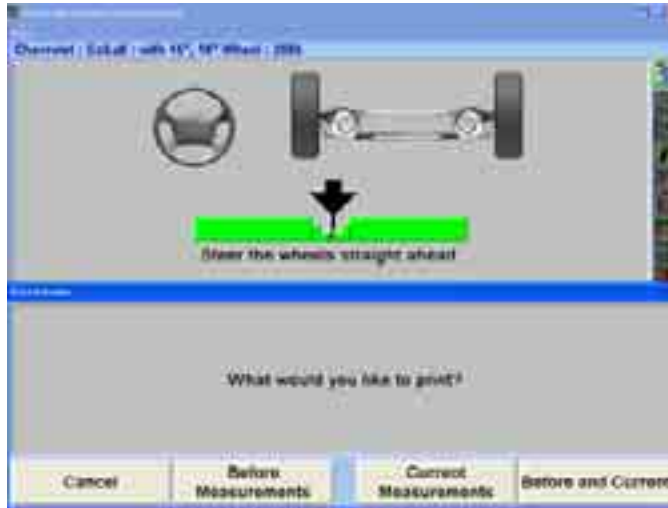
Chevrolet : Cavalier : 1988-2001										Chevrolet : Cavalier : 1996-2001									
Front : Left					Front : Right					Front : Left					Front : Right				
Spec.	-1in.	+1in.			Spec.	-1in.	+1in.			Actual	Specified Range			Actual	Specified Range				
-0.2°	1.0°	1.0°			-0.2°	1.0°	1.0°			-0.2°	-1.2° 0.2°			-0.1°	-1.2° 0.2°				
4.2°	1.0°	1.0°			4.2°	1.0°	1.0°			0.0°	1.3° 1.3°			0.0°	1.3° 1.3°				
0.00°	0.10°	0.10°			0.00°	0.10°	0.10°			0.04°	-0.01° 0.13°			0.02°	-0.01° 0.13°				
										0.2°				0.2°					
										-0.2°				-0.1°					
Included Angle Turning Angle Diff.					Included Angle Turning Angle Diff.					Included Angle Turning Angle Diff.					Included Angle Turning Angle Diff.				
Front					Front					Front					Front				
Spec.	-1in.	+1in.			Spec.	-1in.	+1in.			Actual	Specified Range			Actual	Specified Range				
0.0°	0.2°	0.2°			0.0°	0.2°	0.2°			-0.1°	-0.2° 0.1°			-0.2°	-0.2° 0.1°				
0.10°	0.20°	0.20°			0.10°	0.20°	0.20°			0.0°	-0.2° 0.2°			0.0°	-0.2° 0.2°				
Cross Camber Cross Caster Total Toe					Cross Camber Cross Caster Total Toe					Cross Camber Cross Caster Total Toe					Cross Camber Cross Caster Total Toe				
Rear : Left					Rear : Right					Rear : Left					Rear : Right				
Spec.	-1in.	+1in.			Spec.	-1in.	+1in.			Actual	Specified Range			Actual	Specified Range				
-0.2°	0.0°	0.0°			-0.2°	0.0°	0.0°			-0.2°	-1.0° 0.0°			-0.2°	-1.0° 0.0°				
0.10°	0.10°	0.10°			0.10°	0.10°	0.10°			0.09°	-0.01° 0.10°			0.09°	-0.01° 0.10°				
Camber Toe					Camber Toe					Camber Toe					Camber Toe				
Rear					Rear					Rear					Rear				
Spec.	-1in.	+1in.			Spec.	-1in.	+1in.			Actual	Specified Range			Actual	Specified Range				
0.00°	0.20°	0.20°			0.00°	0.20°	0.20°			0.00°	-0.22° 0.22°			0.00°	-0.22° 0.22°				
0.00°	0.00°	0.00°			0.00°	0.00°	0.00°			0.00°	-0.22° 0.22°			0.00°	-0.22° 0.22°				
Total Toe Thrust Angle					Total Toe Thrust Angle					Total Toe Thrust Angle					Total Toe Thrust Angle				

Print Bar Graphs

In addition to printing the measurements, it is possible to select "Print Bar Graphs" instead of just the text, as shown above.

NOTE: "Print Bar Graphs" or "Print Vehicle" will supply useful printouts only if printed on a color printer.

Press "Print" while in the Vehicle Measurements and Adjustments display. Then select "Print Bar Graphs." A secondary pop-up window with three options is available: "Before Measurements," "Current Measurements," or "Before and Current."



Selecting "Print Bar Graphs" prints the currently selected bar graphs (either the 'Before' readings, or the 'Current' readings) for the front and rear axles. The page below shows the "Before Measurements" selection on the left and the "After" on the right.



2.9 Online Features

WinAlign® contains many online accessible features accessing specifications, data recall and storing, and helpful websites.

ShopResults.NET™

The ShopResults.NET™ Online Service is a subscription feature of WinAlign® software designed to archive alignment results on the web. These results can be viewed by the shop owner, the vehicle owner, and national accounts having the appropriate Internet access.

This feature is available with WinAlign® 7.x, but requires special activation in WinAlign® 6.2.1. (For more information refer to Form 4935T, "Enabling ShopResults.NET™ in WinAlign® v6.2.1.")

The service utilizes the Internet to archive results on the Hunter web server. WinAlign® connects to the web passing data that contains the complete results of the alignment. The results are archived on the web server and a database is maintained that associates the results with individual shops. Each shop has its own "shop ID." The shop can use their shop ID (and associated password) to log onto a web page that accesses previously saved results from both inside WinAlign® and any PC with internet access.

ShopResults.NET™ is integrated with the Work Management and Customer Identification features of WinAlign®. WinAlign® extracts information about the customer from the WinAlign® workorder and passes the information inside the results that are stored on the web.

A new step is added to the end of the alignment procedure to transfer alignment results. This step will connect WinAlign® to the ShopResults.NET™ website transferring the alignment results. After the results have been transferred, a web page will display that will create an EMAIL message that can be sent to the vehicle owner. The email sent to the vehicle owner, or other email contact, will contain a link to the alignment results, and additional information and videos.

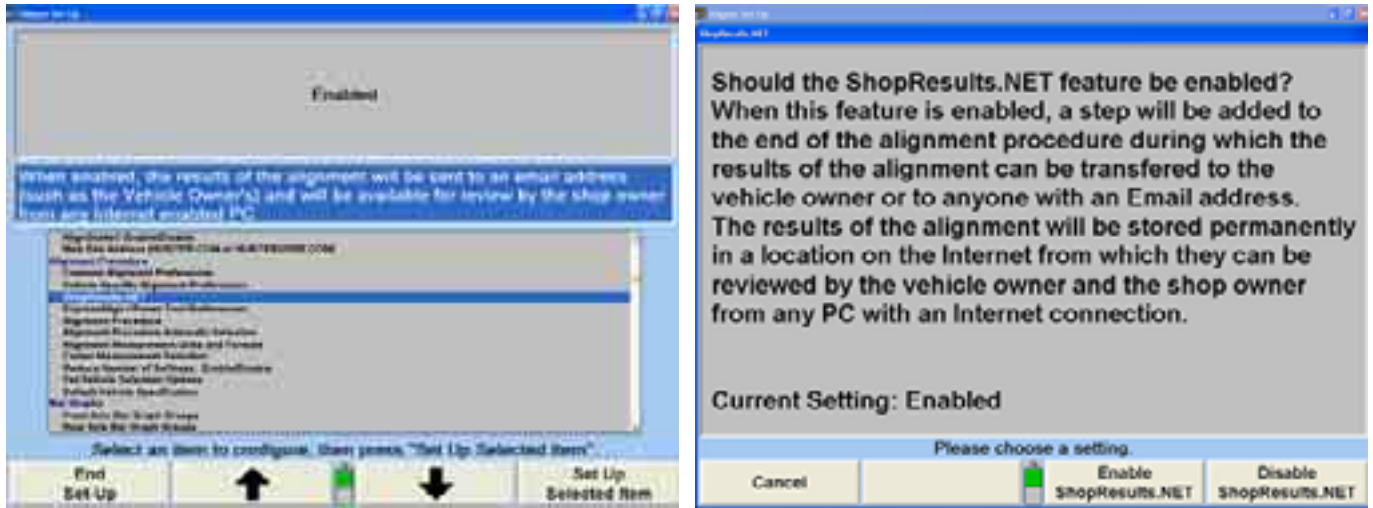
In larger shops that have multiple alignment machines all the machines could be logged in to ShopResults.NET™ under the same name allowing the results to be compiled together.

Setting Up ShopResults.NET™

As previously explained, additional procedures are required to access ShopResults.NET™ Online Service in WinAlign® software version 6.2.1. Please perform these procedures before continuing.

<p>NOTE: ExpressAlign™ must be enabled in Setup for ShopResults.NET to function in WinAlign® version 6.2.1. ShopResults.NET™ will function with all alignment procedures in version 7.x.</p>

To use ShopResults.NET™ the feature must be enabled within WinAlign®. Select “Service Programs,” from the main WinAlign® screen. Select “Set Up Aligner.” On the “Aligner Set-Up” screen, scroll down to “Alignment Procedure” and select “Send Results to ShopResults.NET and the Vehicle Owner.”



Select “Enable ShopResults.NET.” The ShopResults.NET™ icon will now appear at the end of the procedure bar.

Sending Alignment Results from to the Hunter Web Server

NOTE: For best results, Work Management or Edit Customer Identification should be enabled by Setup as part of the Alignment Procedure. This streamlines the process adding the customer's information to the online viewable results automatically. For more information on Setup, Work Management, and Customer Identification refer to Form 3850T, “WinAlign® Software Operation Instructions,” or the online Help within WinAlign®, or Form 4307T, “WinAlign® Quick Reference.”

Within WinAlign®, the technician will identify the customer either through Work Management or on the Edit Customer ID screen. This will add the customer information to the data being saved on the web server allowing for personalization of the results. The results can also be sent to the database without this information.

When ShopResults.NET™ has been enabled in Setup a field for the email address is automatically included on the Edit Work Order and Edit Customer Identification screens.



Work Management Screen




Customer Identification Screen

Continue with the alignment process. When the alignment has been completed, the final step of the alignment procedure will be “Send Alignment Results to the NET.”

This step will connect to the Hunter web server that accepts the alignment results that contains the results of the alignment, the shop information, and the customer information, if it was included. This process is automatically performed after the alignment results have been printed.

	Left	Right
Front		
Camber	-0.9°	-0.9°
Cross Camber	0.0°	
Caster	3.8°	3.8°
Cross Caster	0.0°	
SAI		
Toe	0.19°	0.15°
Total Toe		0.34°
Rear		
Camber	-1.9°	-1.8°
Toe	0.24°	0.21°
Total Toe		0.45°
Thrust Angle		0.01°

NOTE: The results can be sent at any point of the alignment procedure by selecting the  icon at the bottom of the alignment taskbar.

Sending Alignment Results

When the technician reaches the “Send Alignment Results to NET” procedure step, WinAlign® will create a data file and access the Hunter web server. The alignment results will then be archived (uploaded) to the web server.

Logging On to ShopResults.NET™ Online Service

When the user clicks on the “Send Results to Net” icon at the end of the procedure bar or when an alignment has been completed, they will be asked to enter their shop ID and password. If the user chooses to save the password, then the user will never need to re-enter it.



Editing the ShopResults.NET™ Email

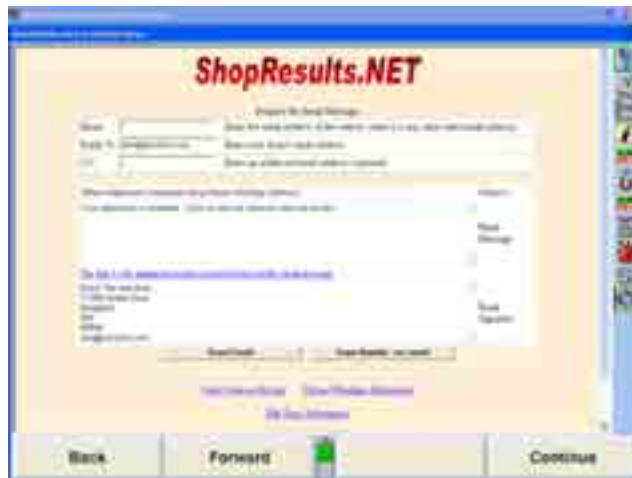
After the website is contacted, the technician can edit the email to the customer. The message includes the email address, the reply email address for the shop, the shop's street address and an email message that instructs the user to click on the link to see the results of the alignment. The email can be sent or carbon-copied to any other valid email address. Examples of this would be family members, business partner, shop manager, fleet office, etc.

Multiple email addresses can be entered by placing a semicolon after each address.

The technician can edit the email to add notes. These notes could include maintenance or service reminders, shop specials, etc.

NOTE:

If the vehicle owner's email address was entered into Work Management or the Customer Identification the field for the owner's email address will be automatically filled in.



The email can be edited by setting the cursor within the message box and typing the new message. The subject line can be changed in the same manner.

The shop information can be changed by clicking on the "Edit Shop Information" link.

Viewing Results before Sending the Email

The technician can view the alignment results before and after they are sent to the user. This web page uses the data that has already been archived on the server, so the page is identical to the page that the vehicle owner will see. The technician has the option of viewing either the simplified readings or the bar graph readings. The email recipient can only view the bar graph results. Notice that the web browser is framed by the WinAlign screen.



How the Email Works

If a customer ID was not entered during the alignment procedure an email address will have to be entered prior to clicking the “Send Email” button. If the customer information was not included in the alignment procedure the bar graph page will only contain the vehicle information, not the customer identification.

When the technician presses the Send Email button, an email will be sent to the email address(es) entered in the “To Email” field (and the “C.C” field). This may be the vehicle owner or other customer contact.

The email will contain the message entered by the technician, the shop’s name and address and a link that will display the bar graph results of the alignment.



Email Recipient Viewing Results in a Web Browser

When the email recipient clicks on the link, the results of the alignment will be displayed in a web browser. These results are extracted from the data file that resides on the Hunter web server.



The alignment results can be viewed in different languages, and both the ‘before’ and ‘after’ readings can be seen in bar graph form.

While holding the mouse over a bar graph, a description of the angle will appear. If further explanation is necessary the bar graph can be clicked on and the user will be redirected to the UndercarInfo.com website and an explanatory video of the specific alignment angle can be displayed.



Uploading Results

Alignment results can also be uploaded (archived) without sending an email. If a customer does not have email access, the results can still be sent to the web server to be archived with the collective results of other alignments. All alignment results are important for generating accurate statistical reports.

Select the “Send Results – no email” button to upload the results. A window will display showing the progress of the upload.

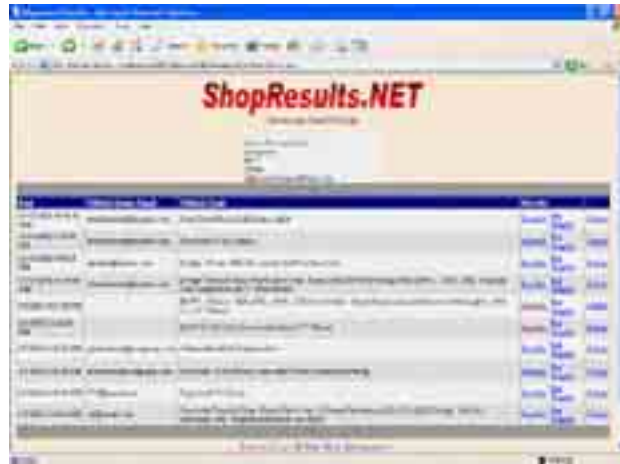


Repair Shop Viewing Previously Saved Results

A shop can view “old” results by logging onto the Hunter web server. This can be done within WinAlign® or within a web browser. (The following screens show the WinAlign® windows on the left, web browsers on the right.)

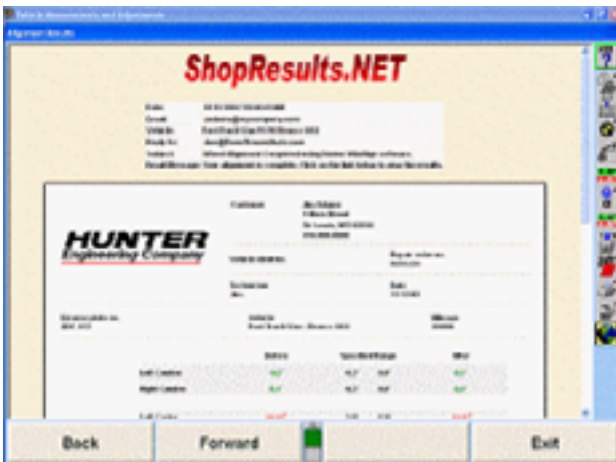


After logging in, the shop owner can see a list of the previously saved results.



If the “Delete” link is clicked, that specific alignment history will be removed from the database.

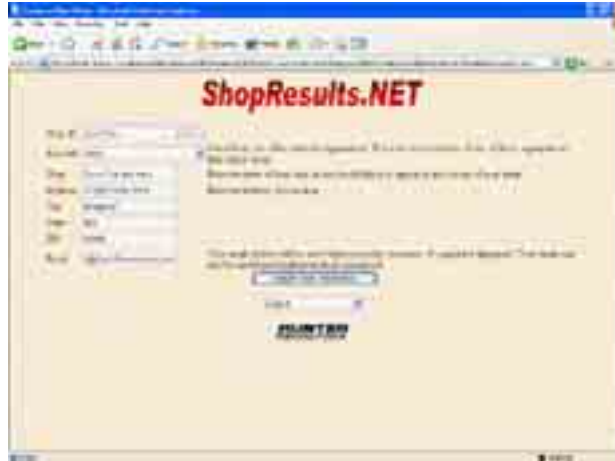
Click on the “Results” or “Bar Graphs” links to view specific results.



Shop Identification

The first time the user attempts to access the feature, a screen will appear requesting information to create a shop profile, a shop ID, and a shop password that will be used for logging into ShopResults.NET™.

Click inside any of the fields and type in the appropriate information. The Shop ID field will be automatically filled in based on your login name provided with your WebSpecs™ or UndercarInfo.com™ ID and password.



Complete the entire form. Entering an email address will automatically fill-in the email address field on the "Send Notification to Customer" screen.

Outdated information can be periodically updated on this screen, as well.

Reports

Besides archiving alignment results, ShopResults.NET™ collects uploaded data into categories useful for tracking the type of work being performed.



Report data is updated twice a month. It is not live.

Reports can be printed in the following categories:

- Cumulative Totals
- Alignments Per Vehicle
- Mileage Report
- Model Year Report
- Alignments Per Week
- Angles Out of Spec Before Alignment
- Angles Out of Spec After Alignment

Example reports:



HunterUser.COM Web Site

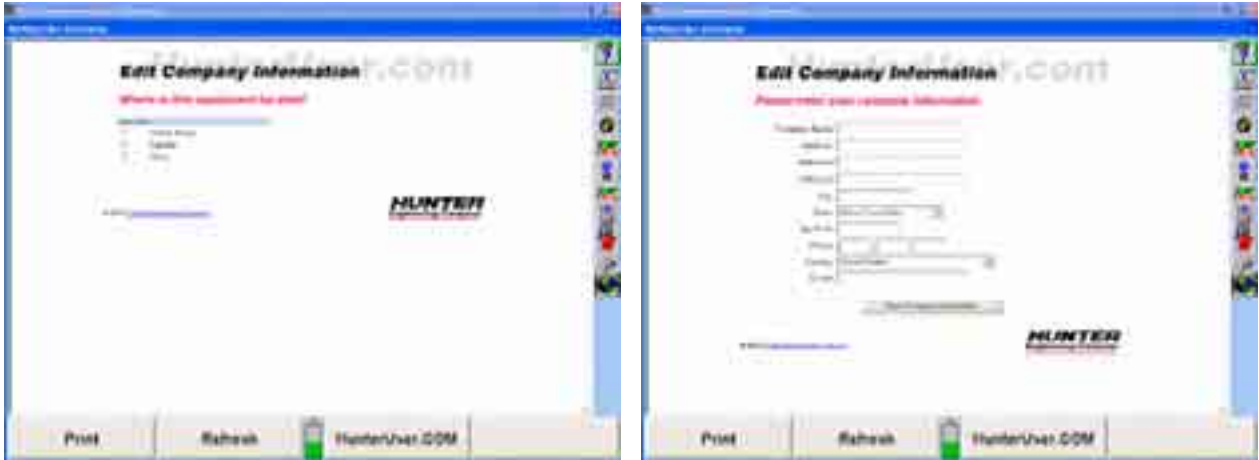
Select the "HunterUser.COM" button to access a personalized website accessible from a 611 Series Aligner with a valid WebSpecs key. The site can also be accessed from drop-down menus within the WinAlign® program as shown below, right.



NOTE: HunterUser.com and the Hunter website are not features of WebSpecs.

The website provides short cuts and access to information from the Hunter website. This feature is available with WinAlign® software 6.1 and above.

The My Company heading can be edited by selecting the “Edit” button. A screen to identify country of origin will appear followed by a screen with the current company information. Fill in all applicable fields and select the “Save Company Information” button.



“My WinAlign System” displays information about your aligner automatically generated from information stored on your console.

“My WinAlign Notices” reads what version of WinAlign® software and specs version are installed on the aligner and indicates if updates available.

Hunter Web Site



Selecting Hunter Engineering Company logo on any page will display the Hunter website homepage within the frame of WinAlign®. The site offers additional information for equipment owners and users, as well as sales and service personnel.

3. WinAlignTuner™ Alignment Procedure

WinAlignTuner™ Overview

WinAlignTuner™ is a specialized alignment procedure geared toward modified vehicles to enhance handling performance or tire life. While WinAlignTuner™ is designed for use primarily with lowered or modified vehicles, the procedure can be used on every car entering the shop.



WinAlignTuner™ works within the WinAlign® alignment software program with custom tailored features for handling the modified vehicle market. WinAlignTuner™ uses modified specifications, vehicle height, road tests, and other features designed for streamlining the process for vehicles that had previously been trial and error.

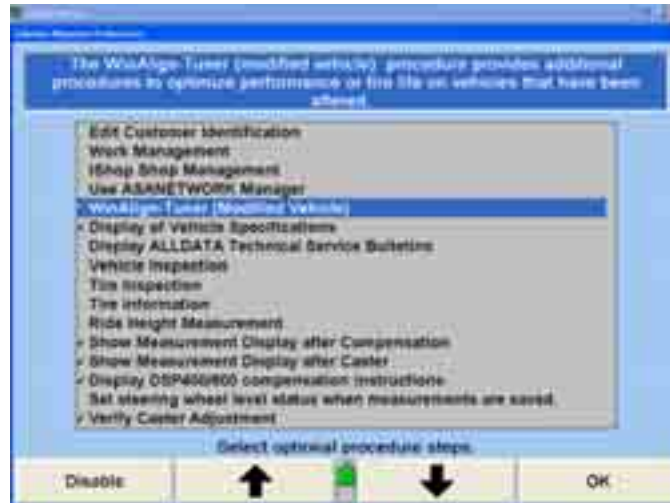
Tuner is only available for WinAlign® version 8.1 and above. Tuner requires a specific electronic key to enable the WinAlignTuner™ procedure.

<p>NOTE: These instructions assume the technician is familiar with advanced alignment procedures. These instructions are supplemental to Form 3850T, WinAlign® Operation Instructions. For detailed operation instructions of all alignment procedures please consult Form 3850T.</p>
--

WinAlignTuner™ Setup

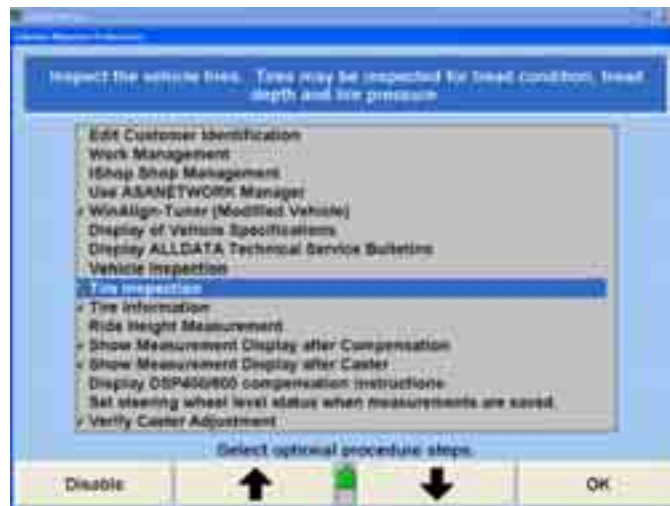
Tuner can be accessed either by enabling it in Setup or within the alignment program.

Enable Tuner in Setup by selecting “Common Alignment Preferences” under the Alignment Procedure heading.



Enable the selection and click “OK.” WinAlignTuner™ is setup to run on every vehicle.

It may be desirable to enable the “Tire Inspection” and “Tire Information” steps in the Common Alignment Preferences. Tire inspection and information are integral, but optional, steps while working on modified vehicles. Tread depth and tread wear can be indications of alignment problems.



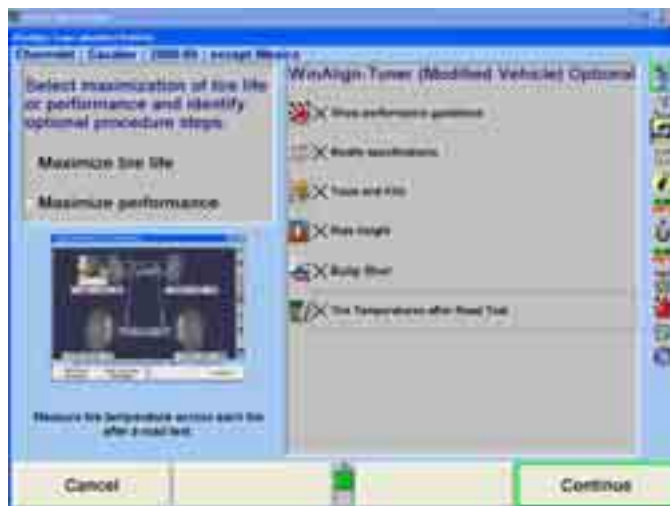
If Tuner is not enabled in setup, it can be accessed during the alignment procedure by selecting the “WinAlign-Tuner Procedure” from the Recall Specifications screen.



WinAlign_{Tuner}™ Procedure

WinAlign_{Tuner}™ Options

WinAlign_{Tuner}™ is designed to improve one of two alignment characteristics: maximizing tire life, or maximizing performance. The Tuner setup screen offers selections to tailor the process.

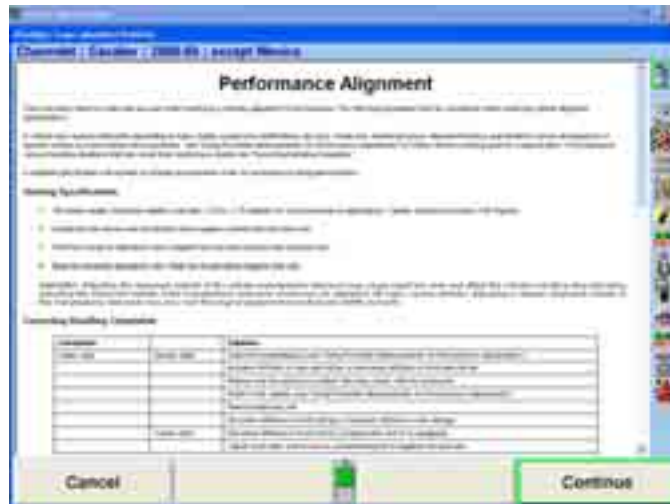


Consult the customer on their driving styles and vehicle uses and determine their needs. Begin by selecting “Maximize Tire Life” or “Maximize Performance.”

Select or deselect the options that are desired.



“Show Performance Guidelines” displays a printable text document that outlines handling complaints and solutions, plus details on using the pyrometer (a device for measuring tire temperature).



“Modify Specifications” opens a special vehicle specifications screen that displays both the original spec and the modified spec. The Performance Guidelines document offers suggestions for modified specs.



“Tools and Kits” opens a Tools and Kits screen that displays parts specifically for modified vehicles. Height modified vehicles often require special adjusters and kits. “Tools and Kits” for WinAlign_{Tuner}™ offers these parts prior to alignment. Review the adjusters, upgrades, and tools presented. Choices will vary according to the vehicle. It may be necessary to install these prior to any alignment adjustments.



“Ride Height” displays a “Vehicle Height” screen that measures fender and axle height.



“Bump Steer” enables the measurement of changes in alignment angles as a vehicle is raised, and lowered (using the Bump Steer winch). The Bump Steer procedure is also available in the standard alignment procedure under “Additional Measurements.”



“Tire Temperatures after Road Test” procedure instructions are outlined in the Performance Alignment document. This procedure uses a pyrometer to measure the tread temperature in various locations of the tires after road test(s) to determine areas of the tire that have undue stress.



Performing a Vehicle Alignment with WinAlign_{Tuner}[™]

The following example alignment procedure will have WinAlign_{Tuner}[™] enabled in Setup.

Select the appropriate vehicle specifications.



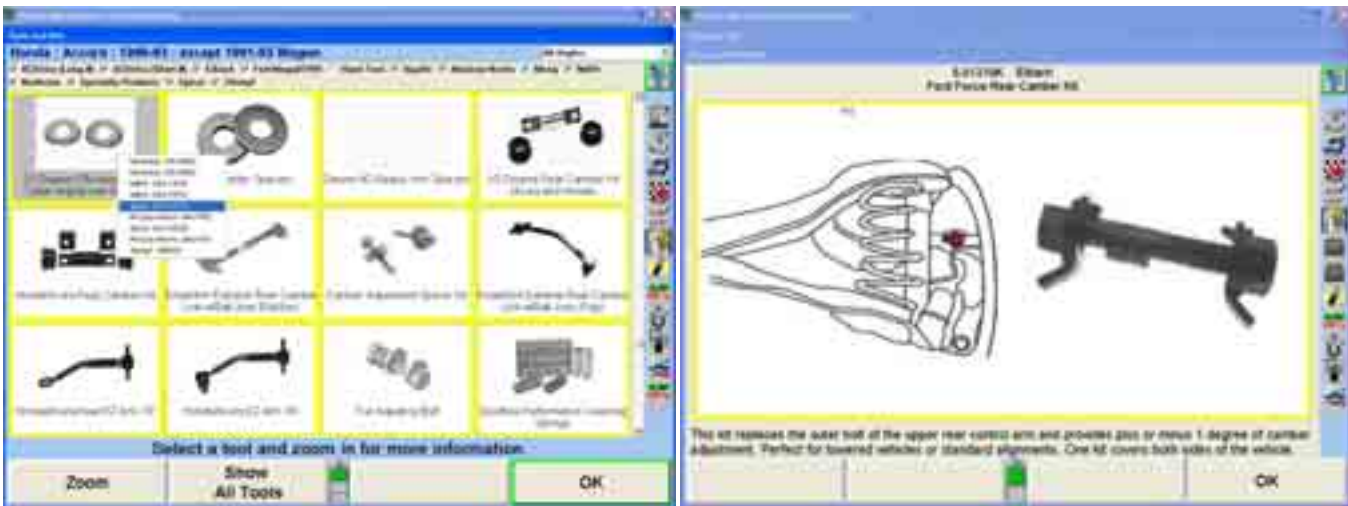
Determine the customer’s needs and select the appropriate option for maximizing tire life or maximizing performance. Select the Tuner options as described in the section above.

Select “Continue” to display the “Vehicle Specifications” screen for modified specifications. Modify specifications according to vehicle testing and instructions on the above document.

Front	Spec.	Tol.
Left Camber	-0.50*	1.25*
Right Camber	-0.50*	1.25*
Cross Camber		1.25*
Left Caster	2.75*	1.00*
Right Caster	2.75*	1.00*
Cross Caster		1.00*
Total Toe	0.00*	0.20*
Left SAI		*
Right SAI		*
Cross SAI		*
Rear		
Left Camber	-0.94*	1.25*
Right Camber	-0.94*	1.25*
Cross Camber		1.25*
Total Toe	0.50*	0.20*
Thrust Angle		*

For more information on specifications refer to section “2.2 Vehicle Specifications” in Form 3850T.

Select “Show Tools and Kits” for modified vehicle adjustment parts and required tools. Tools and Kits contains suspension components, as well. Select a part on the screen. If the part is available from multiple manufacturers a small popup window will appear listing the manufacturer and the part number. The example below shows a rear camber adjusting kit available from seven manufacturers. Select the manufacturer desired and a basic description and instructions screen will appear.



Selecting “Show All Tools” will display all tools and kits available from all manufacturers that are selected. To return to the above screen select “Show Summary.”

If a part has the “Order Now” symbol or softkey the part can be ordered online, providing that the aligner has an internet connection. Select the “Order Now” button to connect to the part manufacturer website. Complete the information and check shipping address. Once the item has been ordered, select “Continue.”



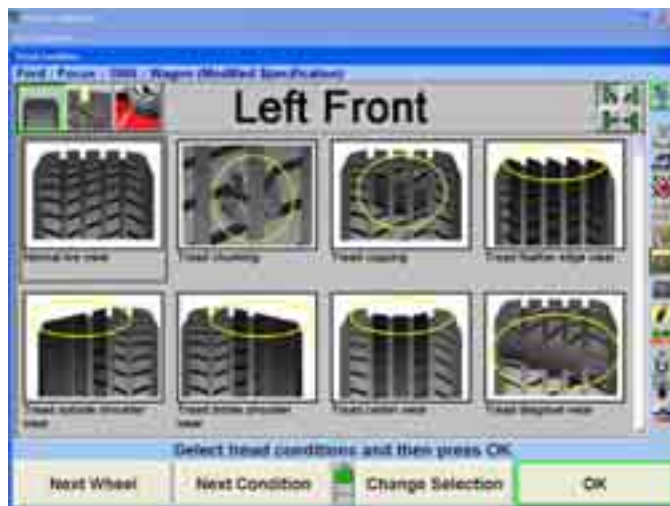
The Tools and Kits screen will reappear. Select “OK” to continue with the alignment procedure.

For more information on Tools and Kits refer to section “4.7 Tools and Kits” in Form 3850T.

If Tire Condition and Tire Information are enabled in Setup, these steps will follow.

Tire Condition identifies wear problems and tire safety conditions such as bulges, cracks, splits, and foreign objects. Select each condition that applies to each tire assembly.

Use the tire position indicator  to change wheel selection.



Select “OK” when all tires have been inspected for wear and damage.

Measure the tread depth and enter with the keyboard. Selecting “Zoom In” shows a detail of each tire. Using the Zoom feature to enter the measured tread depth from three areas: inside, middle, and outside. Wear patterns may be a result of alignment, under-inflation, over-inflation, hard braking, etc. It may be necessary to rotate the tires prior to any road tests. Enter the tread depth for each tire and select “OK.”



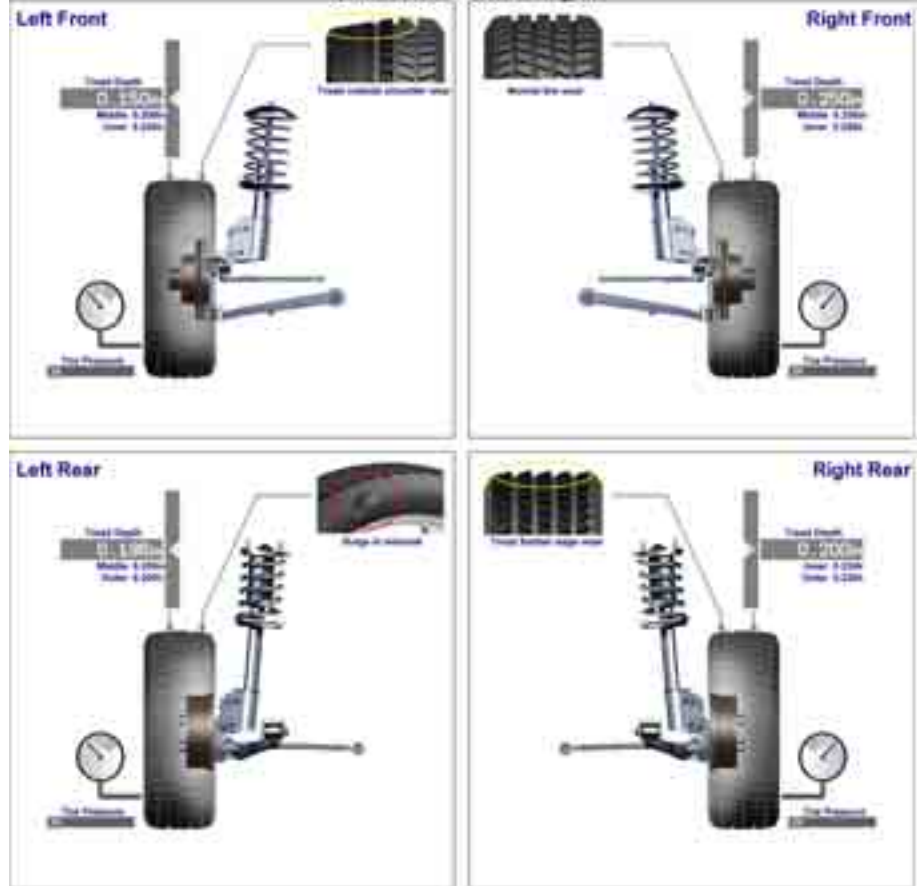
Check and adjust tire inflation pressure. If the vehicle has the original tire and wheel assemblies use the vehicle manufacturer’s recommended tire inflation. If the vehicle has aftermarket tire assemblies, use tire wear patterns and check with the vehicle owner to determine the correct p.s.i.



Select “OK” to continue or select “Print” to print all of the collected tire information.

Work Order ID R00288
 Customer Number 158
 Name Tom Slick
 Address 1 Raceway Dr
 Daytona, FL 32133
 Telephone 555-3333
 Work Phone 444-3333
 Vehicle (VIN) 0m39c038038955
 License SLICK
 Year 05
 Technician Joe
 Mileage 13188
 Time Printed 5/24/05 12:32 PM

Ford : Focus : 2005 : Wagon

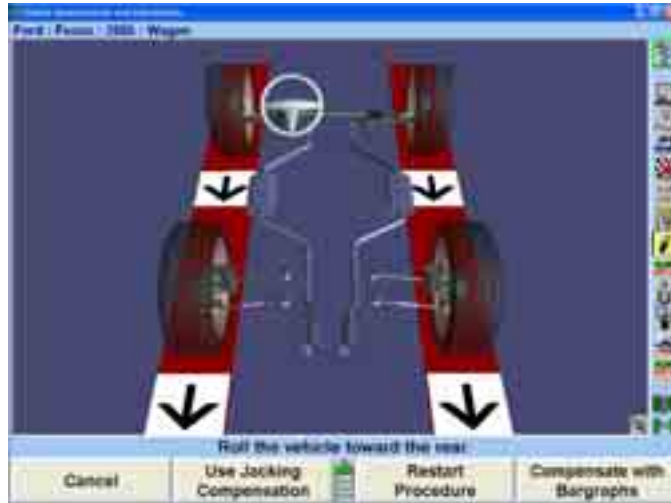


All of the previously collected tire information is added to the Tire Information screen. Complete the remaining blanks for tire manufacturer, tire size, and performance rating.

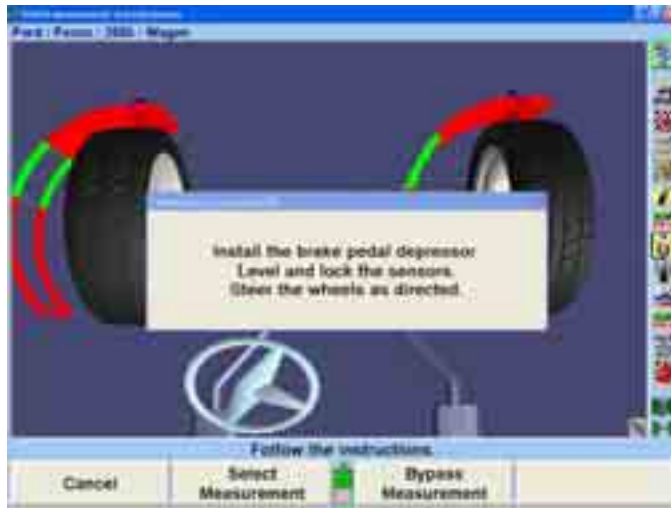


Select "OK" when all fields are completed.

Mount and compensate sensors and select "Continue." For more information on sensors and adaptors refer to section "2.1 Sensors and Targets" in Form 3850T.



Measure caster.

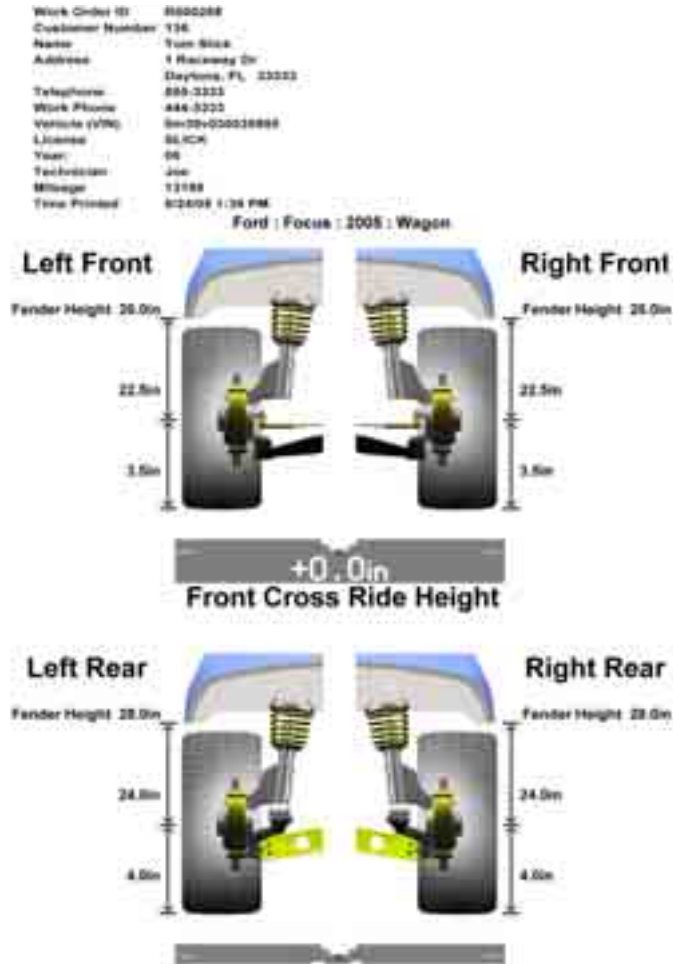


Measure fender height and axle height. Height can be measured manually or measured using the Ride Height Remote Kit 20-1885-1. Refer to Form 5134T for more information on the ride height remote kit.

Unlike conventional ride height measurements that are specific to each vehicle, Vehicle Height measures just fender and axle heights.



Select "Print" for a graphical printout of ride height and select "OK" after all values have been entered and to continue with the alignment process.



The Tuner alignment procedure continues with the Bump Steer measurement. Bump Steer measures any toe change while raising or lowering a vehicle.

NOTE: Bump Steer is also accessible during conventional alignments under the "Additional Measurements" softkey.

When the Bump Steer screen appears make sure the vehicle is steered straight ahead according to the bar graph displayed. Select "Ready" to continue.



Below is a list of the Bump Steer measurement softkey functions available.

Exit	Down	Up	Snapshot Values
Restart Procedure	Undo last Snapshot	Save Before Measurements	Hide "Before" Measurements
Print	Clear current values		
Save Values	Load saved values	Load for comparison	Copy Chart to clipboard
Show File Information	Show Comparison File Info		Help

Select "Up" or "Down" when raising or lowering the vehicle on the rack. Height will be illustrated in .5" increments. The bar graphs are live and will reflect any changes in alignment angles. The drop-down menu offers a list of different angle views.

"Snapshot Values" will take an immediate image of the incremental measurements. "Undo Last Snapshot" will remove the previous incremental image snapshot.

"Save Before Measurements" will save the current collective bump steer measurements as "before" measurements, indicating the initial status of the vehicle. "Hide Before Measurements" will hide the "before" measurements from the screen. Select "Clear Current Values" to remove the values completely.

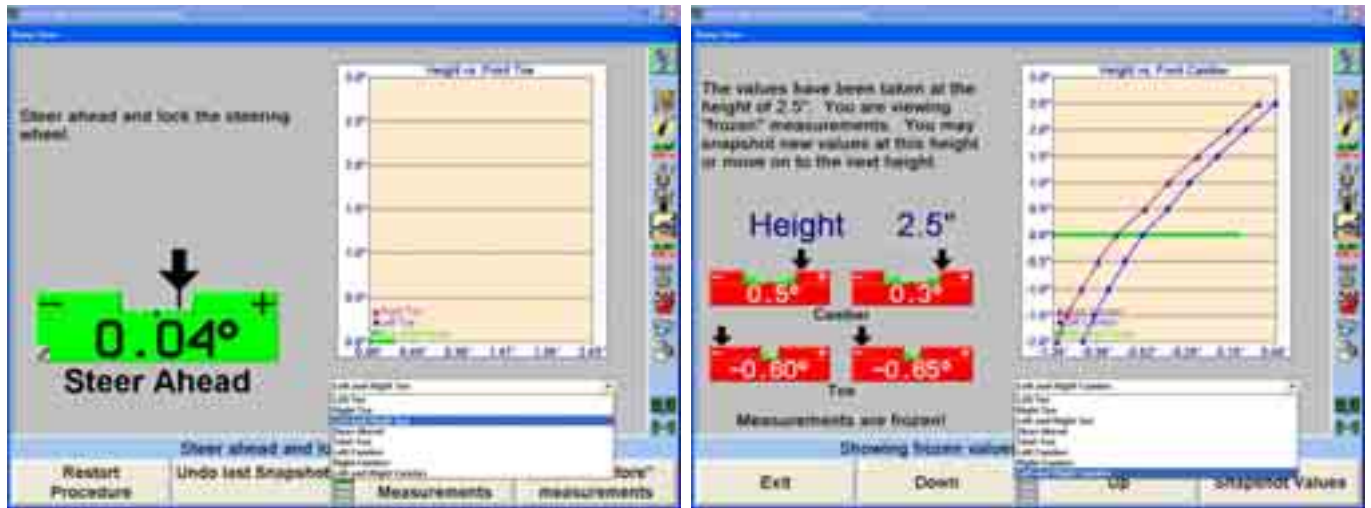
Select "Save Values" to save the measurements to floppy disk. "Load Saved Values" will retrieve measurements from floppy disk. "Load for Comparison" downloads the measurements to the screen indicated by a dotted line for comparison to current live readings.

"Copy Chart to Clipboard" saves the current visible chart to the Windows clipboard. Run the WordPad program and select "paste" to transfer the chart as an image to a WordPad document.

"Show File Information" displays the specifics of the current measurements in tabulated text format. "Show Comparison File Info" displays the same information for the loaded comparison file.

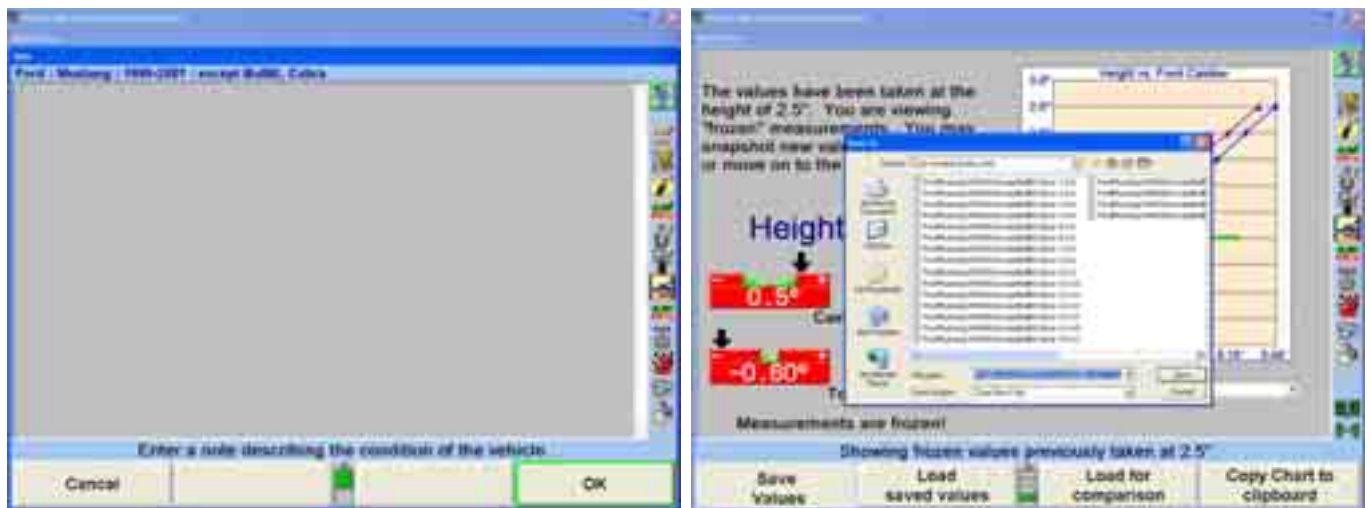
Select "Print" to print all the measurements charts.

Follow the instructions on the screen. Take a snapshot at ride height. Raise the rack and select "Snapshot Values" to measure the changes as the vehicle rises. Snapshots can be taken as often as desired. Raise the vehicle at least three inches to measure incremental changes. Use the drop-down menu to select different angle views. Using the mouse to select various snapshots will produce a virtual view image of the front wheels. Click and hold the left mouse button and move the mouse around the bar graph to change the virtual view image displayed.



After lifting the vehicle to a desired height, repeat the process as the vehicle is lowered. At ride height connect the Bump Steer Winch. Using the winch compress the vehicle below ride height, continuing to take snapshots at various increments.

Once all measurements have been captured, select "Save Values" to store measurements to floppy disk. These measurements can be recalled at any time. A note can be stored with the readings. Enter any specific text necessary to be stored with the measurements and select "OK." Insert a floppy disk and select save. A custom name can be entered, otherwise the measurements will be saved under the specs name (i.e. "FordFocus2005exceptWagon.txt").



Follow the procedure on the ExpressAlign® menu. Notice the following example includes Tire Temperature Test.



Proceed with all vehicle adjustments as indicated by the ExpressAlign menu. Once all adjustments have been completed, remove the sensors and adaptors and follow the instructions for the Tire Temperature Test.



Prior to road testing the vehicle check the condition and air pressure of the tires. Always check the tire pressure while the tire is cold (at rest for at least one hour, or driven for less than one mile). Check with the vehicle owner's recommendations. Some experimentation with tire pressure is normal on modified vehicles. Vehicles that have after-market wheels and tires may not follow the vehicle manufacturer's recommended tire inflation. Vehicles with over-sized wheels and tires, and higher speed ratings will displace the load across a wider surface and may not need the maximum air pressure as listed on the tire. In many cases, the necessary tire pressure will be significantly lower.

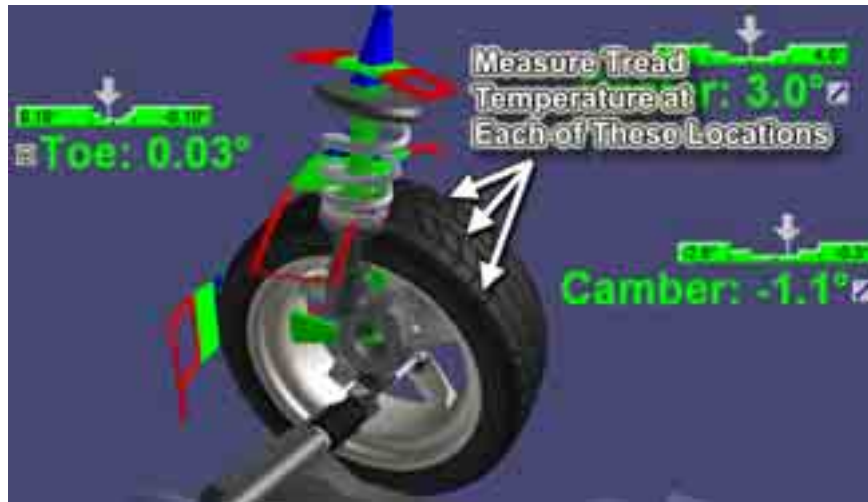
Begin by road testing the vehicle. For Tuner alignments that maximize tire life the road test should be conducted on a straight stretch of road, with little or no traffic. A closed track is the ideal location. Do not use a road that has excessive curves, or poor road surface conditions. The procedure is designed to test the wearing conditions of the tires under as little stress as possible.

Road tests for Tuner alignments that maximize handling should be conducted on a test track, if possible with a sufficient amount of cornering. Getting the tires "hot" in this manner is not recommended on public streets.

Uneven tire temperature across the face of the tread indicates greater force on various portions of the tire resulting in uneven wear and uneven contact with the road surface.

Test the vehicle under safe conditions and speed to adequately heat up the tires. Stop the vehicle and set the parking brake.

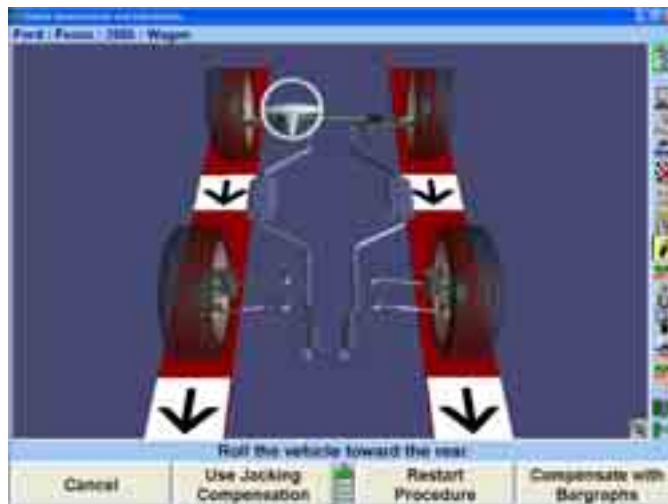
Using the pyrometer, test the temperature of each tire on the tread surface. Take three readings—one on the outside of the tread, one from the center of the tread, and one from the inside tread.



If the pyrometer is connected to the aligner the readings can be directly entered into WinAlignTuner™, or the readings can be entered manually through the keyboard.



Mount sensors and compensate. Select "Continue."



Select “Check with ExpressAlign” and make any necessary adjustments. If the tire temperature values are not consistent, Tuner will calculate further adjustments as illustrated by the ExpressAlign menu.



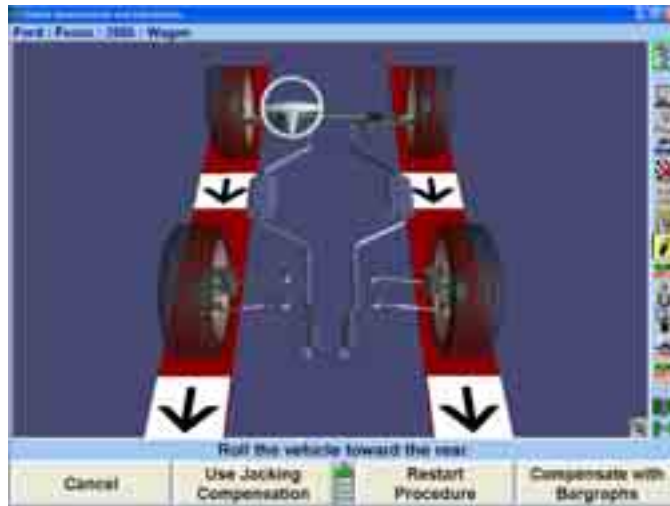
Make the adjustments as indicated and select, “Save After Measurements.”



Road Test the vehicle again according to the instructions above and re-test the tire temperatures. Select “Continue” after all readings have been entered.



Mount sensors and compensate. Select “Continue.”



Select “Check with ExpressAlign” and make any necessary adjustments. If the tire temperature values are not consistent, Tuner will calculate further adjustments. If the values are consistent all adjustments are completed. Select “Print” to print the desired alignment results.



The WinAlign_{Tuner}™ alignment procedure is completed. Select “Reset” to complete the process.

4. Aligner Set-Up

4.1 Set-Up

The aligner can be configured to meet many different operating needs. For example, the “Customer Identification” screen can be removed from the prompt sequence so it does not automatically appear at the beginning of the alignment process, but is still accessible through the menu selection. Other selections such as the default alignment procedure can be set. The Set-Up selections are stored on the hard drive and recalled each time the program needs them. Modify Set-Up by pressing “Service Programs” on the logo screen. The menu labels will change.

Press “Set-Up Aligner” and the “Aligner Set-up” primary screen will appear.



The current settings can be saved to disk or printed. To access these settings along with WinAlign® technical information press CNTRL+Shift+K1. The “Version” screen may take several seconds to appear. Select “Print” to print all the settings and WinAlign information, or select “Copy Log files to Floppy Disk.”







If “Copy Log files to Floppy Disk” is selected the screen will request the user to insert a formatted floppy disk into the drive. Select “OK” and the information will be copied.

The information in Set-Up can only be restored manually.

Factory Settings for Aligner Set-Up

Account	Standard
Display	
Display Language	English
Logo Screen Advertising Message	Blank
Animated Logo or Still Logo	Animated
Animated or Still Procedure Images	Animated Images
Dynamic window open effect	Disabled
AlignGuide Enable/Disable	Enabled
Website Address (Hunter.com or HunterUser.com)	HunterUser.com
Alignment Procedure	
Common Alignment Preferences	WinAlign-Tuner, Show Measurement Display after Compensation, Show Measurement Display after Caster, Verify Caster Adjustment
Vehicle Specific Alignment Preferences	Adaptive Cruise Control, Collision Avoidance System, Ride Height Information
ShopResults.NET	Enabled
ExpressAlign Preferences/Power Tool Preferences	Level III
Alignment Procedure	ExpressAlign Total Alignment with Power Tools
Alignment Procedure Automatic Selection	Automatically switch to Recommended Procedure
Alignment Measurement Units and Formats	
Camber and Caster Display Format	Degrees
Toe Display Format	Degrees
Thrust Angle Display Format	Degrees
Ride Height Display Format	Inches
Tread Depth Display Format	Inches
Wheelbase and Track Width Display Format	Inches
Tire Temperature Display Format	Degrees Celsius
Tire Pressure Display Format	PSI
Caster Measurement Selection	Faster Caster
Reduce Number of Softkeys Enable/Disable	Disabled
Set Vehicle Selection Options	Selection Sequence Optimal
Default Vehicle Specification	None (Choose vehicle specification every time)
Bar Graphs	
Front Axle Bar Groups	Camber, Caster Adjust and Toe; Camber, Caster, Total Toe and Steer Ahead
Rear Axle Bar Groups	Camber, Toe, Total Toe and Thrust Angle
Cross Bar Graph/Additional Cross Angles: Enable/Disable	Enabled
Show Specs on Bar Graphs: Enable/Disable	Enabled
Printer	
Printer	Hunter Driver - IBM PPR
Print Language	English
Printout Advertising Message	Blank
Print Warning Message Enable/Disable	Enabled
Report Format	Standard Format
Setup Default Printout	Print Summary
Custom Print Header	Disabled
Print Preview	Disabled
Sensors	
Sensor Type	DSP600
Toe-Out-On-Turns Device	DSP600 Series Sensors
Update Remote Indicator Software	Remote Indicator requires version "1.1"
DSP400/600 Alignment Reference	Runway Reference Plane
Alignment Bay Configuration	Any lift with 1 turnplate position at standard distance.
DSP400/600 Compensation Procedure	Rolling Compensation
DSP400/600 Emitter Flash Mode	Constant Flash
DSP600 Lighting Mode	Standard Mode
DSP600 Calibration Check Reminder	Never Remind
Cordless Channel Selection	Console Channel: HFSS 1
Power Tools	
Rear Shim Default Brand	Hunter
Rear Shim Display Size	NA
Front Bushing Default Brand	Hunter
Virtual View Enable/Disable	Disabled
Virtual View Caster Steer	Enabled
Virtual View WinToe	Enabled
Live or Manual Ride Height	Manual Entry Ride Height
Tools and Kits "Order Now" Internet ordering	Enabled
Inspection	
Select Inspection Mode	Point and Click Inspection Mode
Date and Time	
Date and Time	Current time and date
12 or 24 Hour Clock Display	12 Hour Clock Display
Date Format	MM/DD/YY
Aligner Equipment	
Remote Control Channel Identification	Remote Control channel setting: A, O
Select Logging Type	Statistical Logging
Shut down Windows on Exit from WinAlign	Disabled
Transmit Measurements	
Transmit Measurements Destination	Transmit Measurements to a file.
Transmit Measurements Format	Partial Measurements C111 Audit Format A
Work Management	
Work Order Format	Custom Forms
Logon	
Logon Enable/Disable	Disabled
Logon Registry	NA
Logon Password	NA
Automatic Backup Options	Keeps backups for two days. Overwrite oldest backup. Backup path C:\Backup.dat
Tread Depth	
Define Tread Depth Specification	Not defined

The “Aligner Set-Up” primary screen provides a list box of Set-Up items. Press  or  to highlight the desired selection. When an item is highlighted, the current setting appears on the screen, along with an explanation of the item. Press “Set-Up Selected Item” to open the popup screen to Set-Up the highlighted item.

To move from a major heading to another major heading, press  or  from the second tier of softkeys. The following is a list containing all the Set-Up options including options using Digital Video.

Press “End Set-Up” after all the desired changes have been made to exit Set-Up and save changes.

4.2 Display

Setting up the display provides standard language options, customized logos and messages, and various viewing options.



Setting up the Display Language

The Display Language identifies the language that appears on the screen displays. This selection will not change the language used in the printouts.

When “Display Language” is selected, the “Display Language” popup screen appears with the current setting on the screen.



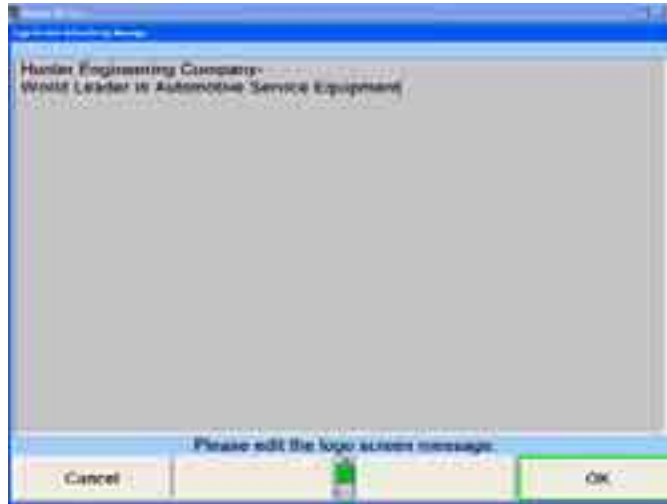
A list of available languages is shown along with the current setting.

Press  or  until the desired language is highlighted.

Press “OK” to select the highlighted language for the screen displays and return to the “Aligner Set-Up” primary screen.

Setting up the Logo Screen Advertising Message

When “Logo Screen Advertising Message” is selected, the “Logo Screen Advertising Message” popup screen appears.



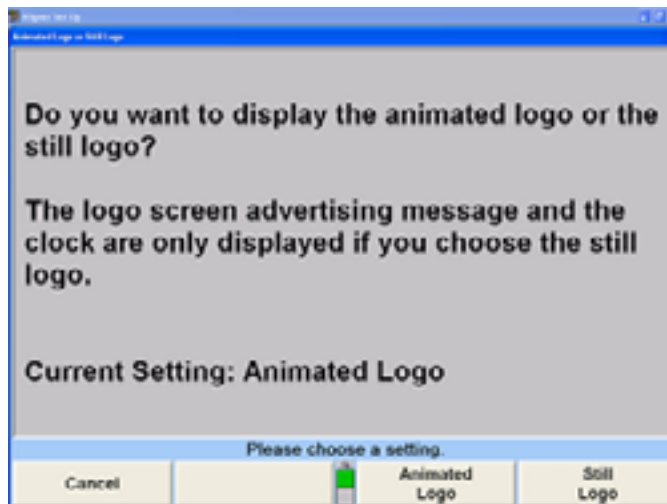
This item displays an advertising message that will alternate with the logo image on the logo screen.

Enter a message using the keyboard.

After the message has been entered, press “OK” to store the new message or press “Cancel” to restore the old message. The program stores the message on the hard drive and returns to the “Aligner Set-Up” primary screen.

Setting up the Logo Screen

When “Animated Logo or Still Logo” is selected, the “Animated Logo or Still Logo” popup screen appears.



The user can select either an animated logo or the traditional still logo to display while the program is idle. If using a personal advertising message, the Still Logo must be enabled.

Setting up the Dynamic Window Open Effect

When “Dynamic Window Open Effect” is selected, the “Dynamic Window Open Effect” popup screen appears.



Enabling “Dynamic Window Open Effect” causes popup screens to open with an “expansion” effect where the popup screens appear to zoom open from the cursor’s location.

Press “Enable Window Open Effect” to enable “Window Open Effect.”

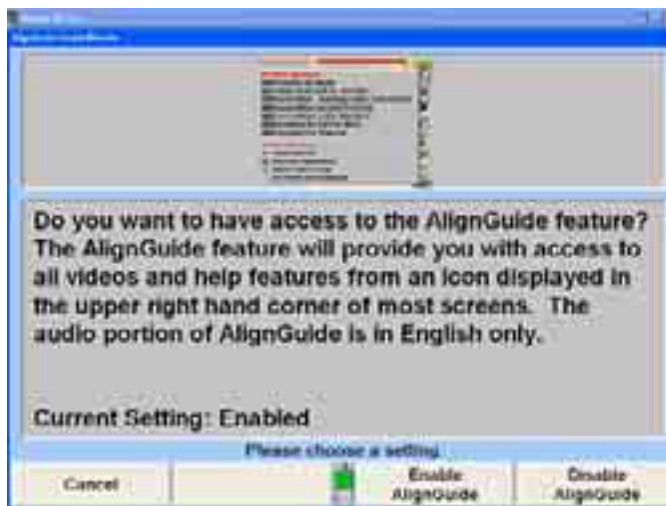
OR

Press “Disable Window Open Effect” to Disable “Window Open Effect.”

Press “OK” to set the default to the “Window Open Effect” selection. The program will store the information on the hard drive and returns to the “Aligner Set-Up” primary screen.

Setting up the AlignGuide® Feature

When “AlignGuide Enable/Disable” is selected, the “AlignGuide Enable/Disable” popup screen appears.



Select “Enable AlignGuide” or “Disable AlignGuide.” Enabling the AlignGuide® gives easy access to an array of information including videos, animation, and WinAlign® Help.

Setting up the Web Site Address

Two separate Hunter websites are accessible directly from the aligner console when it has an Internet connection HunterUser.com, and Hunter.com.



HunterUser.com is customized to the particular user and piece of equipment being used to access the website. HunterUser.com provides easy shortcuts to the most common alignment documents on the Hunter website.

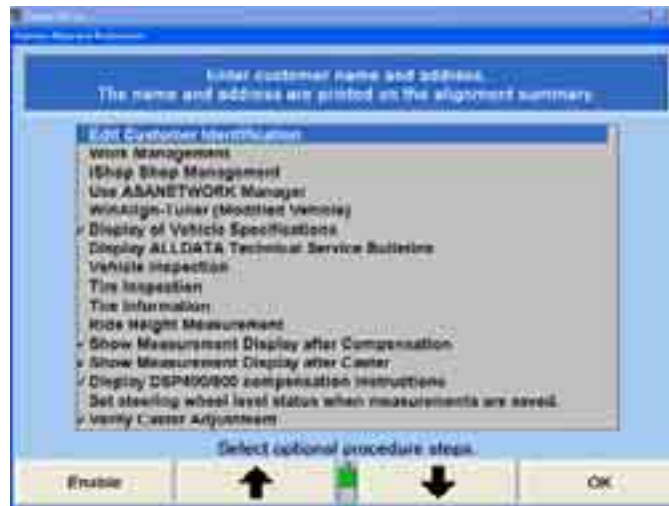
Hunter.com is the homepage and starting point for all detailed information about Hunter Engineering Company and its products.

4.3 Alignment Procedures



Alignment Procedures set-up tailors the alignment process to the individual shop.

Setting up the Common Alignment Preferences

When "Common Alignment Preferences" is selected, the "Common Alignment Preferences" popup screen appears.



This selection will Set-Up the aligner program to include or omit certain screens or processes in the alignment procedure.

Press  or  to highlight the procedure to be included or omitted, or select with the mouse or other pointing device.

Press “Disable” and the checkmark disappears. The highlighted procedure will not appear in the alignment sequence.

Press “Enable” and a checkmark appears. The highlighted procedure will appear in the alignment sequence.

NOTE: Ride Height measurements are taken after mounting and compensating the sensors.



NOTE: After technicians are familiar with using DSP400/600 Sensors, it is recommended that the aligner Set-Up feature for “Display DSP400/600 Compensation Instructions” be disabled.

Press “OK” when the selections are completed. The program will store the settings on the hard drive and return to the “Aligner Set-Up” primary screen.

Setting Vehicle Specific Alignment Preferences

Vehicle Specific Alignment Preferences applies only to specific cars that require individualized procedures. Currently, the specific preferences to set-up are “Adaptive Cruise Control, Collision Avoidance System” and “Ride Height Information.”



Press  or  to highlight the screen to be included or omitted.

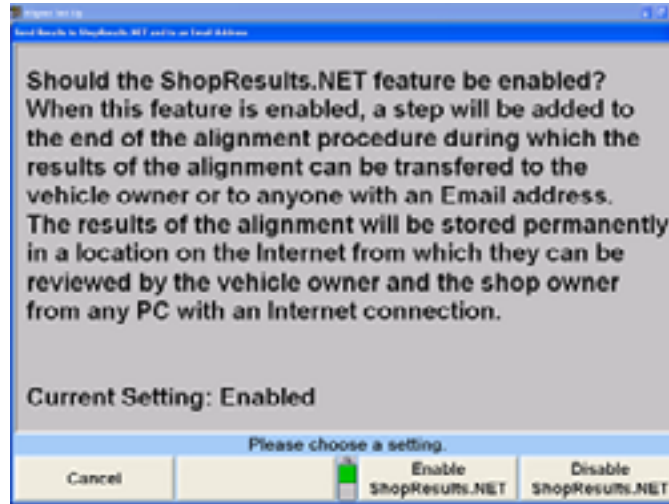
Press “Disable” and the checkmark disappears. The highlighted screen will not appear in the alignment prompt sequence.


Press “Enable” and a checkmark appears. The highlighted screen will appear in the alignment prompt sequence.

Setting up ShopResults.NET™

NOTE: This feature is standard with WinAlign® 7.x, but requires special activation and setup in WinAlign® 6.2.1.
(For more information refer to Form 4935T, “Enabling ShopResults.NET™ in WinAlign® v6.2.1.”)

When “Send Results to ShopResults.NET and to an Email Address” is selected, the “Send Results to ShopResults.NET and to an Email Address” popup screen appears.



Enable ShopResults.NET™ to archive alignment results on the Hunter web server, and have the option of emailing the results to the customer or any other email recipient. When enabled this icon, , will be available at the bottom of the alignment procedure bar.

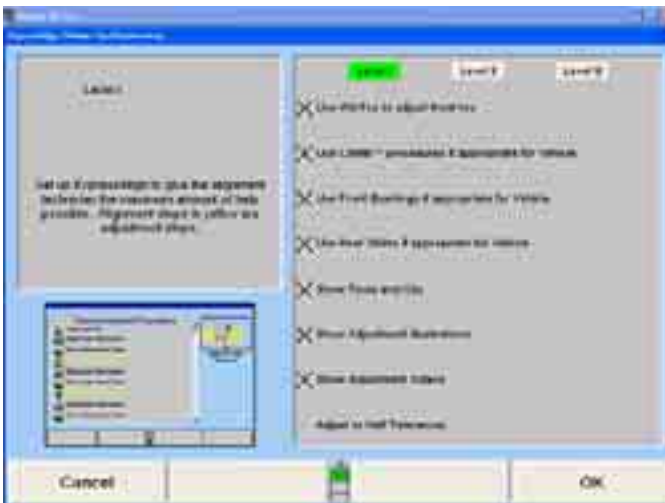
When disabled the ShopResults.NET™ icon will be unavailable.

Setting up the ExpressAlign®/Power Tool Preferences

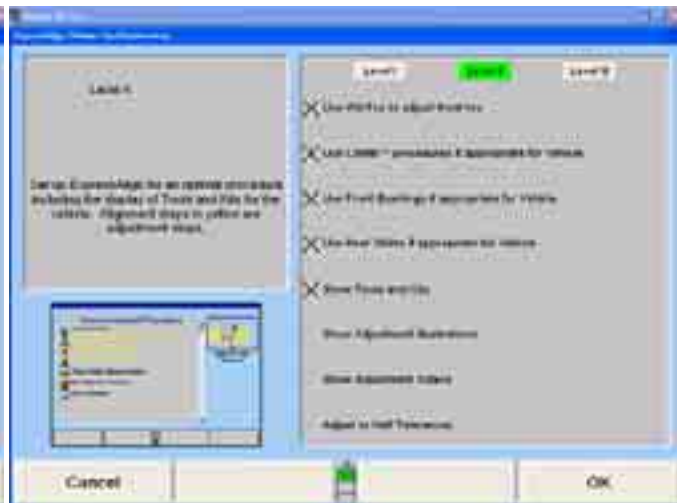
When “ExpressAlign Preferences” is selected, “ExpressAlign Configuration” popup screen appears. The default setting is Level III.

This selection will Set-Up the aligner program to include or omit certain alignment power tools.

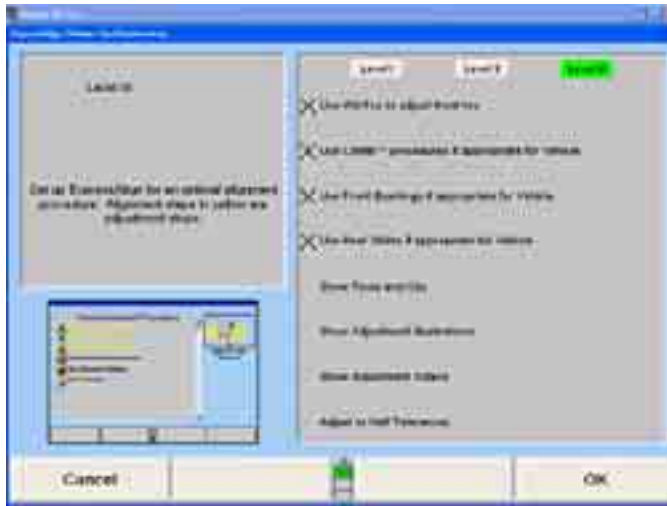
There are three levels of ExpressAlign® that may be selected. Select “Level I,” “Level II” or “Level III.”



Level I





Level II



Level III

A power tool can be added or removed from any level.

Press  or  to highlight the power tool to be selected or deselected.

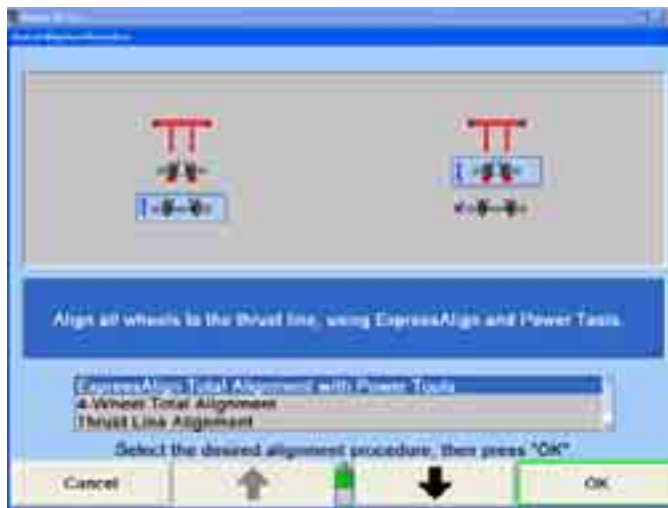
Press “Deselect” and the “X” disappears. The highlighted power tool will not be available to be used in ExpressAlign®.



Press “Select” and an “X” appears. The highlighted power tool will be used in ExpressAlign®.

Press “OK” when the selections are completed. The program will store the settings on the hard drive and return to the “Aligner Set-Up” primary screen.

Setting up the Alignment Procedure

When “Alignment Procedure” is selected, the “Control Alignment Procedure” popup screen appears with the current setting on the screen.



Press  or  until the desired alignment procedure is highlighted. The steps required are illustrated for the highlighted procedure.

If 4-Wheel Alignment, Thrust Line Alignment, or Self-Directed 4-Wheel Alignment is selected ExpressAlign will be disabled.

For an explanation of these procedures, refer to “Alignment Types.”

Press “OK.”

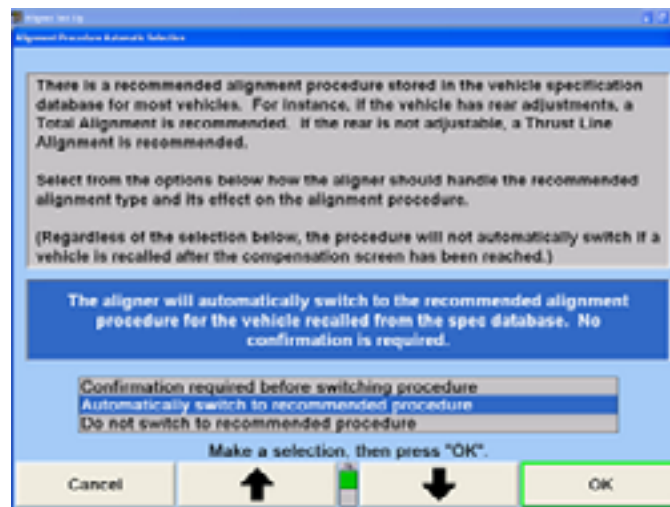
NOTE: The steps required to perform an alignment procedure may not be the same as the “Getting Started” example. By following the screen prompts, any type of alignment can be performed.

If a “two sensor” procedure is used, the rear sensors must be mounted on the rear wheels (even though they are not used) so that their toe transducers will communicate with those in the front sensors. Using this procedure, the rear sensors cannot be compensated.

The program stores the setting on the hard drive and returns to the “Aligner Set-Up” primary screen.

Setting up the Alignment Procedure Automatic Selection

When “Alignment Procedure Automatic Selection” is selected, the Alignment Procedure Automatic Selection” popup screen appears.



A recommended alignment procedure is stored in the vehicle specification database for most vehicles. For instance, if the vehicle has rear adjustments, a Total Alignment is recommended. If the rear is not adjustable, a Thrust Line Alignment is recommended.

If “Confirmation required before switching procedure” is selected, the aligner program will ask if you want to perform the recommended alignment procedure.

If “Automatically switch to recommended procedure” is selected, the aligner program will automatically switch to the recommended procedure. This setting is the default setting.

If “Do not switch to recommended procedure” is selected, the aligner program will go through the default alignment procedure.

Press  or  to highlight the desired item.



Press “OK.” The program will store the setting on the hard drive and return to the “Aligner Set-Up” primary screen.

Setting up the Alignment Measurement Units and Formats

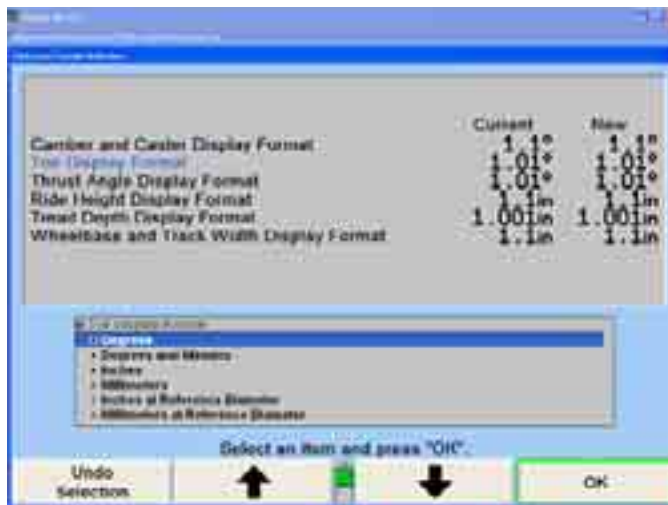
When “Alignment Measurement Units and Formats Set-Up” is highlighted, the current settings for the various alignment display formats are shown in the form of example measurements. When this item is selected, the “Alignment Measurements Units and Formats Set-Up” popup screen appears.





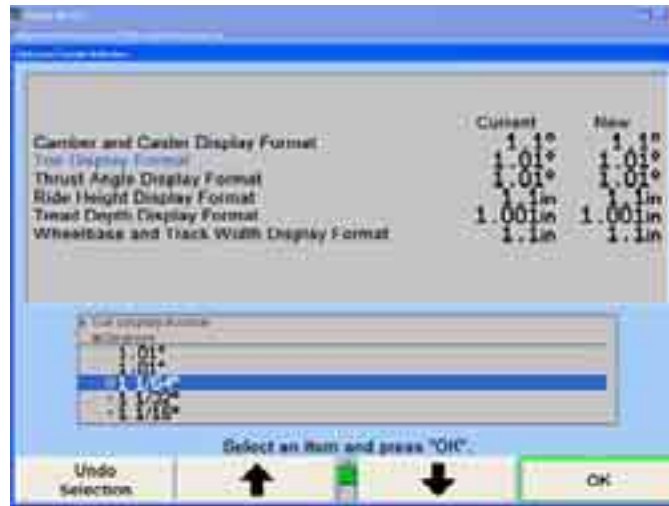
This popup screen allows the units and formats for the various alignment display formats to be changed. Both the “Current” and “New” settings are shown as example measurements.



Press  or  to highlight a display format. When a display format is highlighted, a brief explanation of the measurement type appears.



Press “Set-Up Selected Item.” The “Units and Format Selection” popup screen appears. The units and formats can be changed for the highlighted display format. This popup screen continues to show the current and new settings for all the display formats.



The units and formats for each display format are selected on this popup screen. Press  or  to highlight the desired units, then press “OK.” The screen changes to show the formats available for the selected unit(s).



Press  or  to highlight the desired format, then press “OK.” If the selected format is fractional, a third selection must be made, in the same manner, to select whether the fractions are to be reduced. When the final choice is made, the popup screen closes and the display returns to the “Alignment Measurement Units and Formats Set-Up” popup screen. The new example for the display format shows the recent selection.

Press  or  to highlight another parameter type and continue to Set-Up the units and formats for all the parameter types. When the new examples show the desired units and formats, press “Apply New Settings.” The program stores the new settings on the hard drive and returns to the “Aligner Set-Up” primary screen.

About Units

“Units” refers to the physical units in which the measurements are made for the various parameter types. “Angular” measurements, such as camber and thrust angle, are measured as degrees, but can be displayed in the units of degrees or degrees and minutes. “Distance” measurements, such as ride height and wheelbase, are measured as inches but can be displayed in the units of inches or millimeters.

Toe measurements are always measured as degrees, but can be displayed either as angular or distance measurements. To display toe as an angle, select the units of degrees or degrees and minutes. To display toe as a distance, select the units of inches, millimeters, inches @ reference diameter, or millimeters @ reference diameter.

When toe is displayed as a distance, it refers to the difference in track width between the trailing and leading edges of the tires or wheels. The critical question is, “At what diameter of tire or wheel is this distance measured?” A larger diameter means a greater distance for a given angle. If the units are inches or millimeters, the diameter is assumed to be 28.648 inches, thus providing a simple conversion of 2 degrees of toe equals 1 inch for toe (or 25.4 millimeter of toe). If the units are inches @ reference diameter or millimeters @ reference diameter, the system uses the reference diameter that is entered on the “Vehicle specifications” primary screen.

NOTE:	Domestically, the units of inches @ reference diameter are used primarily by the heavy truck industry. The units of millimeters @ reference diameter are used primarily in Europe.
-------	--

About Formats

Format refers to the numerical format with which the measurements are displayed for the various parameter types. Only certain choices are available for each parameter type but the choices are all found in the following list:

decimal	1.01	rounded to the nearest 0.01
decimal	1.05	rounded to the nearest 0.05
decimal	1.1	rounded to the nearest 0.1
decimal	1.25	rounded to the nearest 0.25
minutes	1°01'	rounded to the nearest 1'
minutes	1°05'	rounded to the nearest 5'
fractional	1 ¹ / ₄	rounded to the nearest 1/4
fractional	1 ¹ / ₈	rounded to the nearest 1/8
fractional	1 ¹ / ₁₆	rounded to the nearest 1/16
fractional	1 ¹ / ₃₂	rounded to the nearest 1/32
fractional	1 ¹ / ₆₄	rounded to the nearest 1/64

If a fractional format is chosen, the fraction can be reduced or non-reduced to the least common denominator. Examples that illustrate this are as follows:

reduced fractions 1/16, 1/8, 3/16, 1/4, ...



non-reduced fractions 2/16, 2/8, 4/16, 4/8, ...

Setting up the Caster Measurement Selection

When “Caster Measurement Selection” is selected, the “Caster Measurement Selection” popup screen will appear.



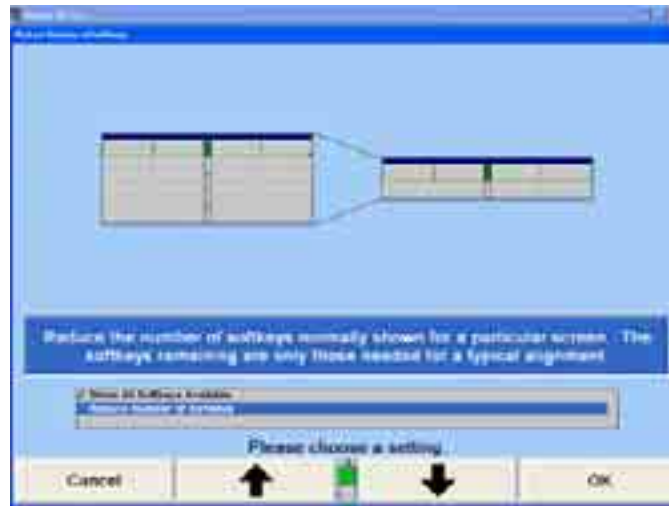
This selection will Set-Up the aligner program to measure Caster Only, FasterCaster (Caster and SAI/IA), or SAI/IA Only as the default. If a Toe-out-on-turns device is enabled in Sensor Set-Up, three additional selections will appear. Those are FasterCaster/SAI/IA Toe-out-on-turns at 20 degrees, Caster/Toe-out-on-turns at 20 degrees, and SAI/IA/Toe-out-on-turns at 20 degrees.

Press  or  until the desired angle is highlighted. When an angle is highlighted, a brief explanation appears.



Press “OK” to set the default to the highlighted measurement selection. The program stores this information on the hard drive and returns to the “Aligner Set-Up” primary screen.

Setting up the Reduce Number of Softkeys: Enable/Disable

When “Reduce Number of Softkeys: Enable/Disable” is selected, the “Reduce Number of Softkeys” popup screen appears with the setting on the screen.



When “Reduce Number of Softkeys” is enabled, the number of softkeys that are normally shown for a particular screen will be reduced to only the number of softkeys needed for a typical alignment. To temporarily access all available softkeys when “Reduce Number of Softkeys” is enabled, select “Show All Softkeys.”



Press  or  until “Show All Softkeys Available” or “Reduce Number of Softkeys” is highlighted.

Press “OK.” The program selects the highlighted item and returns to the “Aligner Set-Up” primary screen.

Setting up the Set Vehicle Selection Options

Select “Set Vehicle Selection Options” the “Set Vehicle Selection Options” popup screen appears with the current setting on the screen. Vehicle Selection Sequence determines the way vehicles are recalled.



Press  or  to highlight the selection sequence to be available. Press “OK” when the selections are completed. The program will store the settings on the hard drive and return to the “Aligner Set-Up” primary screen.

Default Vehicle Specification

When “Default Vehicle Specification” is selected, the Recall Specifications screen will appear. Select the preferred vehicle to appear and press “OK” to return to Aligner Set-Up. This vehicle’s specifications will always be recalled automatically at the beginning of the alignment procedure. If a vehicle has been set as the default, it can be removed in the same manner, by pressing “No Default Spec.”

4.4 Bar Graphs



Bar Graph set-up selects the individual styles and types of bar graphs to display.

Setting up the Front Axle Bar Groups

When “Front Axle Bar Groups” is selected, the “Front Axle Bar Groups” popup screen appears.



This item will select the bar graphs to be available while viewing the front axle measurement screen. Each bar graph configuration chosen can be viewed by pressing “Show Next Bar Graphs” on the “Vehicle Measurements and Adjustments” primary screen.

Press  or  to highlight the bar graph group to be available.

Press “Enable Bar Group” and a checkmark appears. The highlighted group will be available.

Press “Skip Bar Group” and the checkmark disappears. The highlighted bar group will not be available.

Press “OK” when the selections are completed. The program will store the settings on the hard drive and return to the “Aligner Set-Up” primary screen.

Setting up the Rear Axle Bar Groups

When “Rear Axle Bar Groups” is selected, the “Rear Axle Bar Groups” popup screen appears.



This item will select the bar graphs that will be available on the rear axle measurement screen when “Show Next Bar Graphs” is pressed on the “Vehicle Measurements and Adjustments” primary screen.

Press  or  to highlight the bar graph group to be available.

Press “Enable Bar Group” and a checkmark appears. The highlighted group will be available.

Press “Skip Bar Group” and the checkmark disappears. The highlighted bar group will not be available.



Press “OK” when the selections are completed. The program will store the settings on the hard drive and return to the “Aligner Set-Up” primary screen.

Setting up the Cross Bar Graph/Additional Cross Angles: Enable/Disable

When “Cross Bar Graph/Additional Cross Angles: Enable/Disable” is selected, the “Cross Bar Graph/Additional Cross Angles: Enable/Disable” popup screen appears.



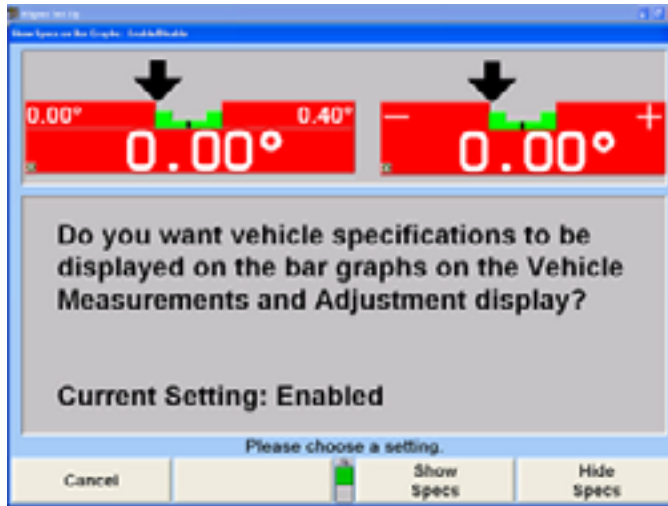
This selection will Set-Up the aligner program to show or hide the Cross Bar Graph/Additional Cross Angles.

Press  or  to highlight Show or Hide Cross Bar Graph/Additional Cross Angles.

Press “OK” when the selections are completed. The program will store the settings on the hard drive and return to the “Aligner Set-Up” primary screen.

Setting up the Show Specs on Bar Graphs: Enable/Disable

When “Show Specs on Bar Graphs: Enable/Disable” is selected, “Show Specs on Bar Graphs: Enable/Disable” popup screen appears with the current setting on the screen.



This selection will Set-Up the aligner program to display or hide the vehicle specifications on bar graphs.

Press “Show Specs” to have the vehicle specifications appear on the adjustment bar graphs or “Hide Specs” to have the + and – appear on the adjustment bar graphs. The program stores the setting on the hard drive and returns to the “Aligner Set-Up” primary screen.

4.5 Printer

The aligner has the same printer settings that any pc would have. A printer can be selected if the aligner is connected to a network, or if multiple printers are accessible.

Other options to be setup are the printout language, advertising message, and various formats.

Setting up the Printer

When “Printer” is selected, the Windows Print Manager screen appears.



NOTE: Depending on the operating system, or service pack, some printer setup instructions may be different.

From the “Print Manager” screen, highlight the printer that you are using.

Click on “File” and then select “Set As Default.” This will set the printer as the default printer for the console.

NOTE: If the printer is already set as default, there will be a check mark to the left of “Set As Default,” which indicates the printer is already the default printer.

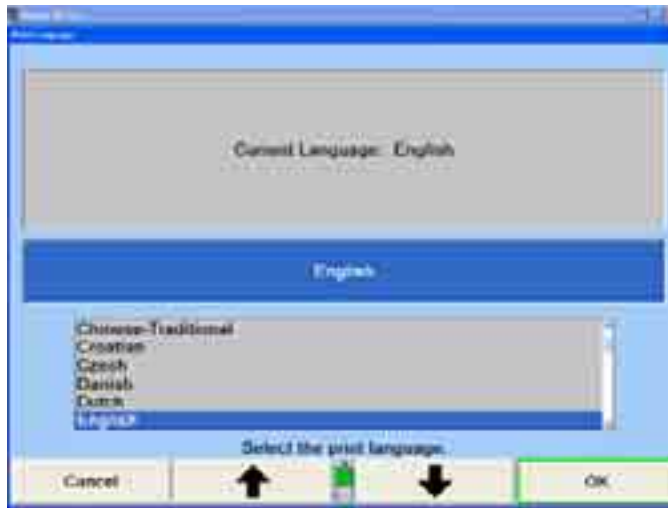
To add a printer, select “Add a printer” from the left hand pane and follow the instructions on the “Add Printer Wizard.”

To exit printer Set-Up, click on “File,” and select “Close.”



Setting up the Print Language

The Print Language identifies the language that appears on the printouts. This selection will not change the language on the screen displays.

When “Print Language” is selected, the “Print Language” popup screen appears with the setting on the screen.



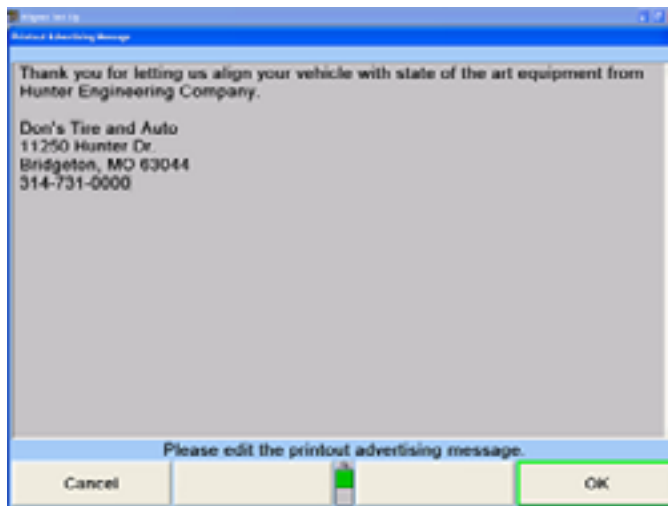
A list of the available languages is shown along with the current setting.

Press  or  until the desired language is highlighted.

Press “OK.” The program selects the highlighted language for the printouts and returns to the “Aligner Set-Up” primary screen.

Setting up the Printout Advertising Message

When “Printout Advertising Message” is selected, the “Advertising Message” popup screen appears.



This screen allows you to enter an advertising message to be printed at the beginning of the print summary and the inspection report. You may enter a long message, but if the message is too long, the printout may extend to multiple pages.

Enter a message using the keyboard.

After the message has been entered, press “OK” to store the new message or press “Cancel” to restore the old message. The program stores the message on the hard drive and returns to the “Aligner Set-Up” primary screen.

Setting up the Print Warning Message: Enable/Disable

When “Print Warning Message” is selected, the “Print Warning Message” popup screen appears.



This item selects whether or not a warning message will appear on the printout. If “Yes” is selected, the alignment summary printout will show an asterisk (*) next to any measurements that are not within specifications. A message will appear at the bottom of the printout to explain the meaning of the asterisk.

Press “Yes” or “No.” The program stores this setting on the hard drive and returns to the “Aligner Set-Up” primary screen.

Setting up the Report Format

When “Report Format” is selected, the “Report Format” popup screen appears.

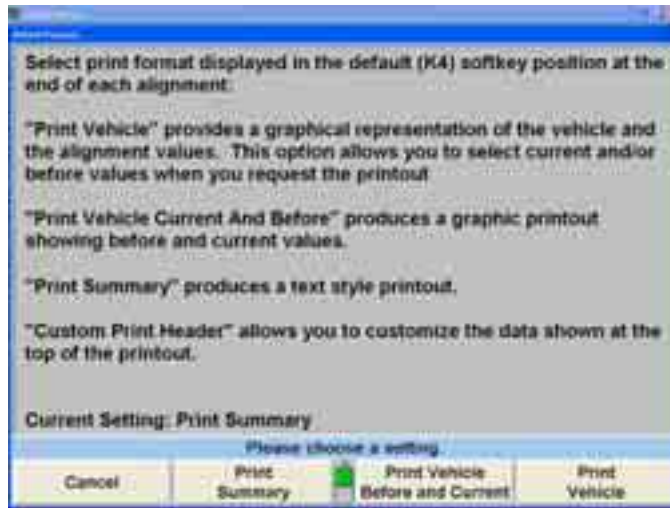


This screen allows you to select the “Standard” or “Column” format for reports.

Press “Standard” or “Column” for the desired report format to be used. The program selects the report format and returns to the “Aligner Set-Up” primary screen.

Setup Default Printout

When "Default Printout" is selected the "Default Printout" popup screen appears. The Default Printout format can be set to "Print Summary," "Print Vehicle Before and Current," or "Print Vehicle" from the first level of softkeys. Select the appropriate format that the aligner will always print.



Select "Print Summary," "Print Vehicle Before and Current," or "Print Vehicle." Once a selection is made the program returns to Aligner Set-up.

The following examples use the Print Preview feature:

"Print Summary" will print all the measurements in chart form.



“Print Vehicle Before and Current” will print the bar graphs prior to adjustment and the current state of measurements.

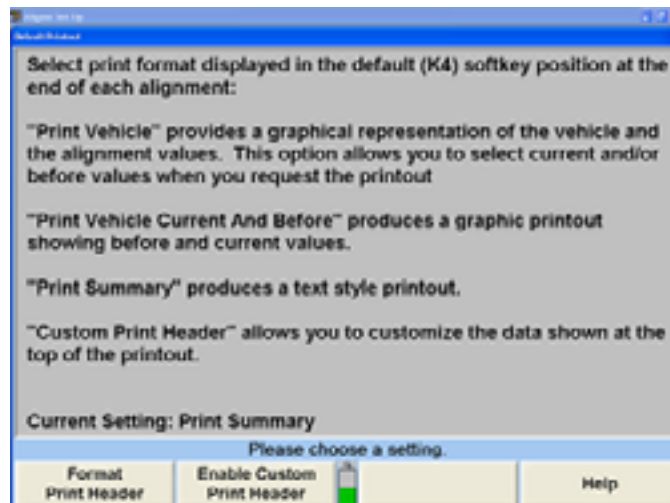


“Print Vehicle” will only print the current measurements in bar graph form.



Custom Print Header

Select “Enable Custom Print Header” from the second tier of softkeys on the “Default Printout” screen to customize the information that will display at the top of the printout.



After the Custom Print Header has been enabled the program will return to Aligner Set-up. The Print Header can be customized by selecting “Default Printout” and select “Format Print Header” from the second tier of softkeys to open the “Configure Print Header Format” popup screen.

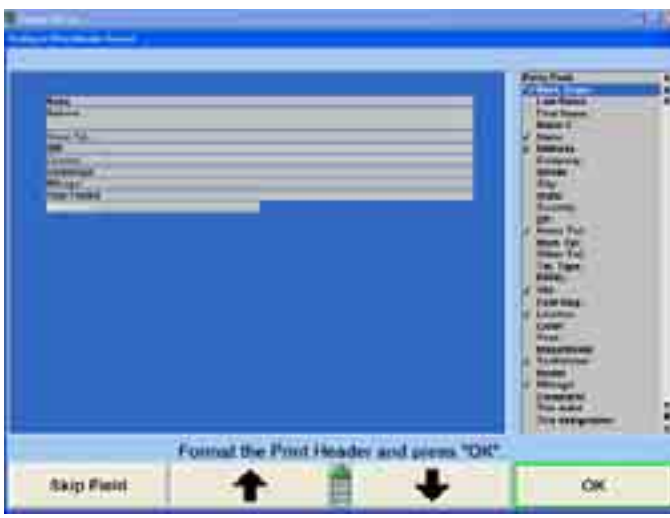


Fields can be added, removed, moved, and have the height and width changed.

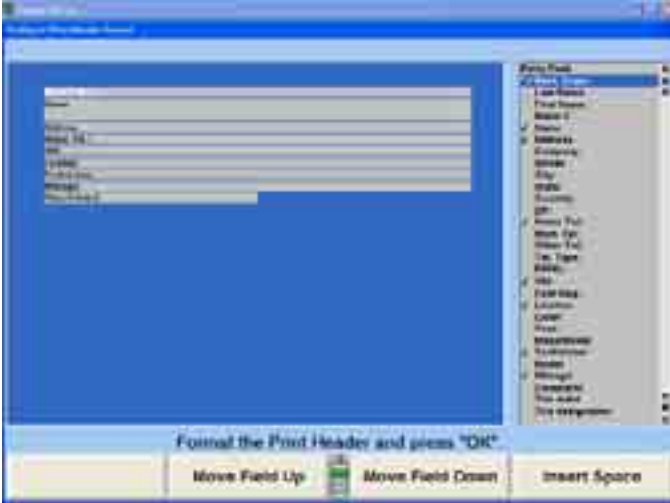
To add a field, highlight the desired field, and select “Include Field.” To move through the possible selections, select it with the mouse, or scroll through the list on the right using the arrow keys on the keyboard, the arrow softkeys, or the scrollbar on the right side of the list.



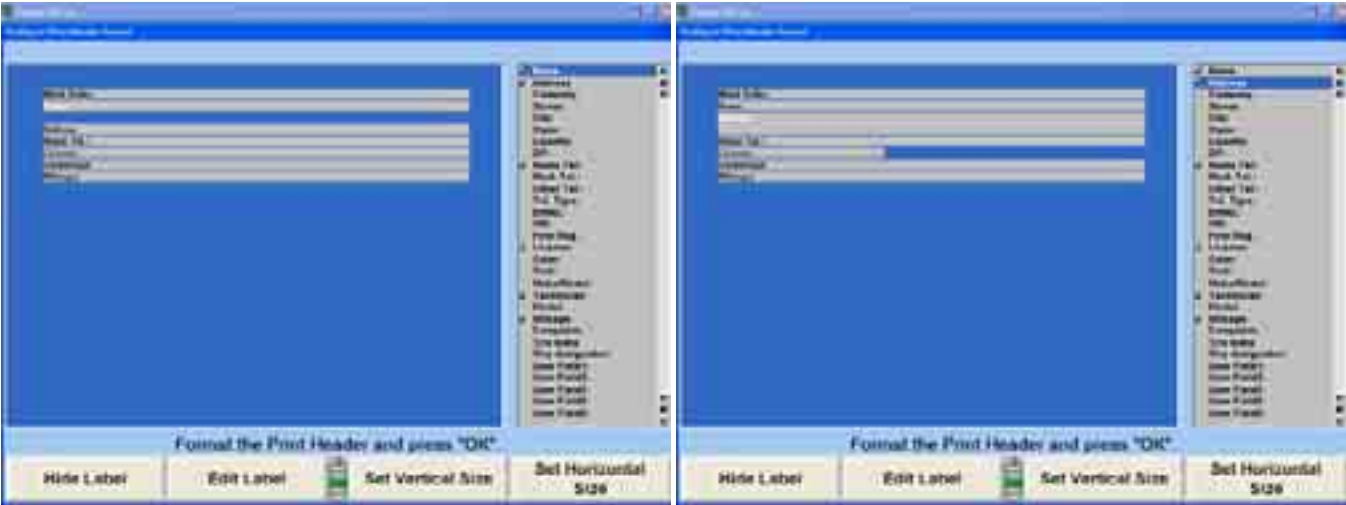
The field will automatically be placed at the bottom of all existing fields. Selected fields in the Header Format will show the text as white. The example below has added the Work Order field.



To move the field to a different location in the header format, highlight the field, and select the “Move Field Up” or “Move Field Down” softkeys to re-position the field. The Work Order field has been moved to the top, as shown below. Select “Insert Space” to insert blank spaces between fields.

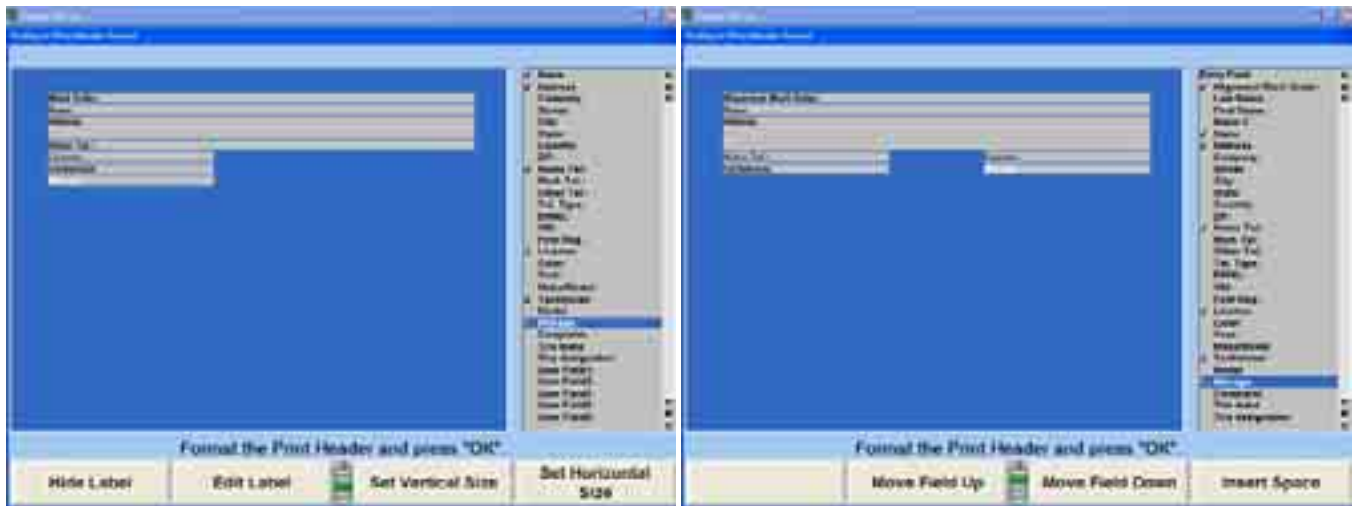


A field can have the vertical height increased or decreased depending on the amount of information to be displayed. The following example reduced the height of the name field. The address field was then moved up and the field height was increased, as shown at right.



Highlighting the field and selecting “Set Horizontal Size” will change the width of the field.

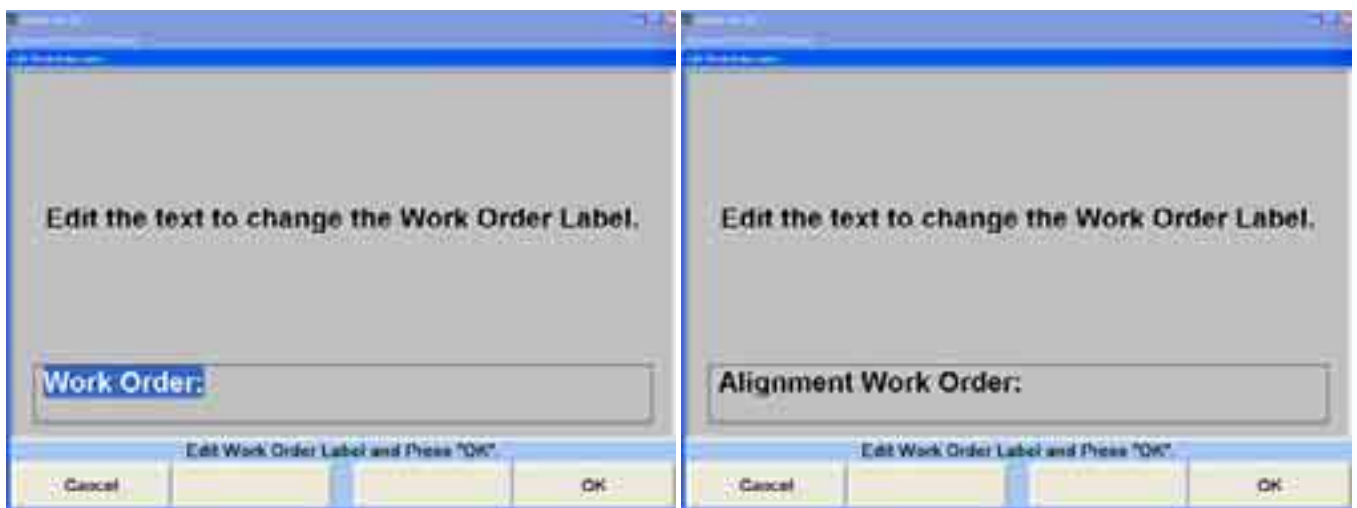
The following example shows that the License, Technician, and Mileage fields have been narrowed. Narrowed fields can be placed side by side by highlighting the field and selecting the Move Up or Move Down option, as appropriate. The example on the right places smaller fields in columns thereby saving printout space.



Select “Hide Label” to remove the label from the printout. The field will turn gray, indicating that it has been hidden. The field data will still print, however. Select “Show Label” to turn the field label back on.



Select “Edit Label” to customize the label text. The example below changes “Work Order” to “Alignment Work Order.” Select “OK” to accept the changes to the label text.

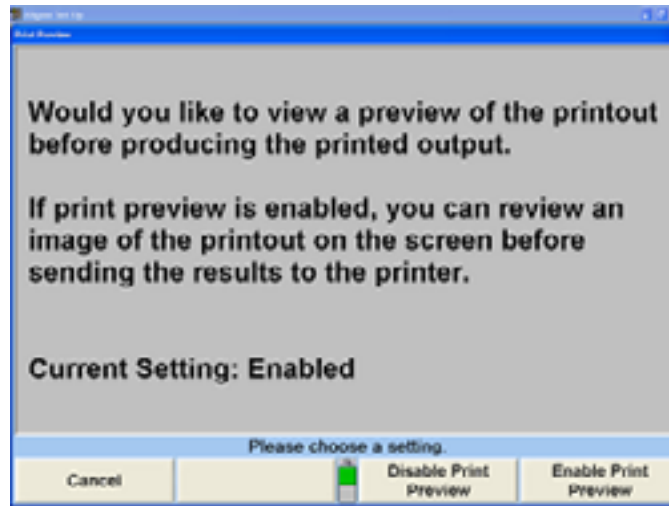


The Header format can further be customized to hide or show the ruled lines in between the fields, or to place the information next to the label or below it.

All changes can be discarded by selecting “Revert to Default.”

Setup Print Preview

Select “Print Preview” to enable or disable the print preview feature. When enabled, an image of the selected printout can be viewed prior to actual printing.



The print preview feature can be disabled within WinAlign on the Print window.

4.6 Sensors



Sensor settings cover sensor type, and all associated hardware and software. These settings should be set-up by the service personnel.

Setting up the Sensor Type

When “Sensor Type” is selected, the “Select Alignment Sensor Type” popup screen will appear.



The sensors are identified on the serial number labels.

Press  or  until the desired sensor type is highlighted. When a sensor group is highlighted, a brief explanation of the group appears.



Press “OK” to set the default to the highlighted sensor type. The program stores this information on the hard drive and returns to the “Aligner Set-Up” primary screen.

Depending on the sensor type selected other options will be available in Set-Up.

Setting up the Toe-Out-On-Turns Device

When “Sensor Type For Toe-Out-On-Turns” is selected, the “Sensor Type Selection” popup screen appears with the current setting on the screen.



Press  or  until the desired sensor type is highlighted. When a sensor type is highlighted, a brief explanation of that type appears.

Press “OK” to set the default to the highlighted sensor type. The program stores the setting on the hard drive and returns to the “Aligner Set-Up” primary screen.

Updating the Remote Indicator Software

If there is an optional wireless remote indicator being used, periodically software will require updating.

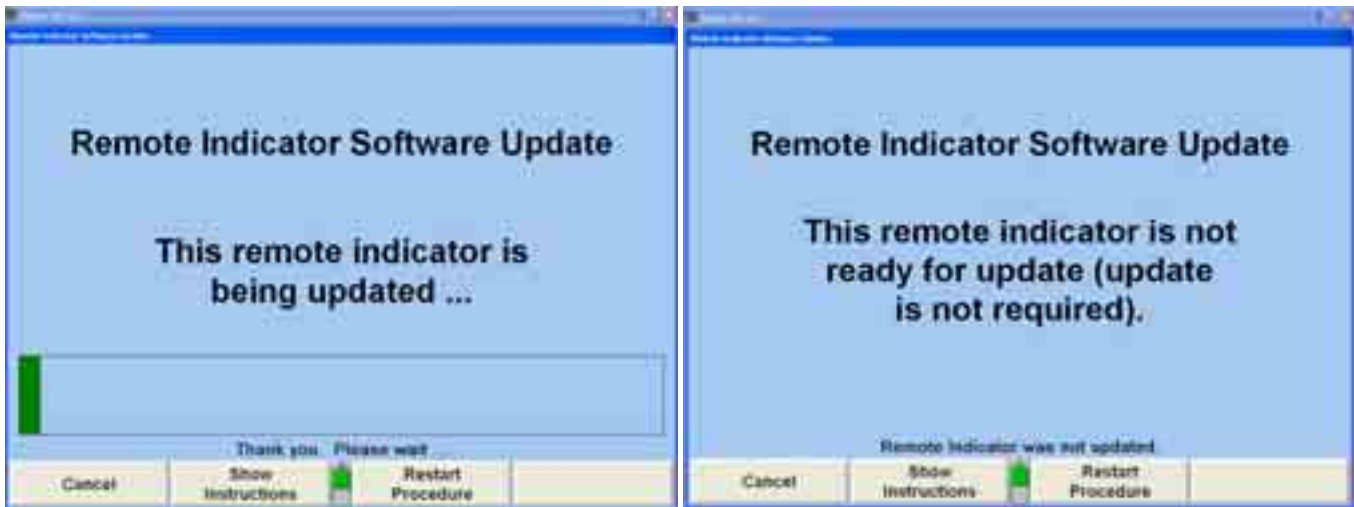
Select “Update Remote Indicator Software” from under the Sensors heading.

Connect the remote indicator to the console with a Burndy cable. Press and hold the K1 and K4 keys on the remote indicator while turning the remote on.



Continue holding the K1 and K4 keys down until a “b” appears on the remote indicator’s display.

The popup window will show either the progress of the software being updated, or will show that no software update is necessary.



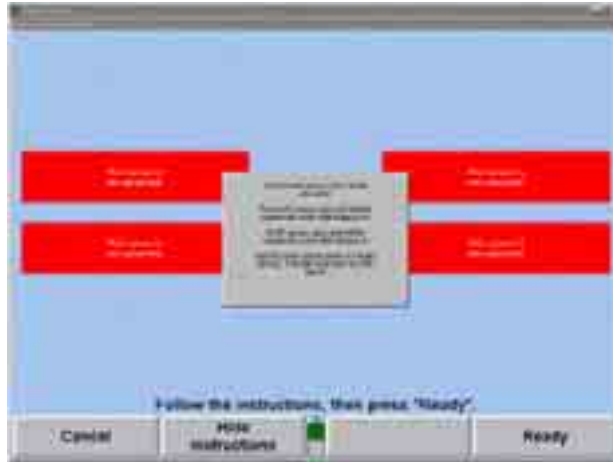
When the update is complete select "Exit" to return to the main Setup screen.



Updating the Sensor Software

NOTE: Sensor Software Update is dependent upon the sensors that have been defined in Sensor Set-Up. Make sure that Sensor Set-Up is Set-Up with the sensors being used with the console. If Set-Up is completed, WinAlign will automatically check the sensors' software and notify if an update is needed.

The "Sensor Software Update" popup screen updates the software in the sensors.



Sensor software requires updating when the version found in the sensor is not the same, as the version required by the console. This might happen when the console software is updated or when the control board of a sensor is replaced. The console can send the correct software to the sensor, which the sensor then stores in its own non-volatile memory.

NOTE: The sensor software can be updated in any number of sensors at once. For example, if the console software is updated and sensor software must be updated as a result, all four sensors can be updated simultaneously. If a single sensor is repaired and requires an update, that sensor can be updated by itself.

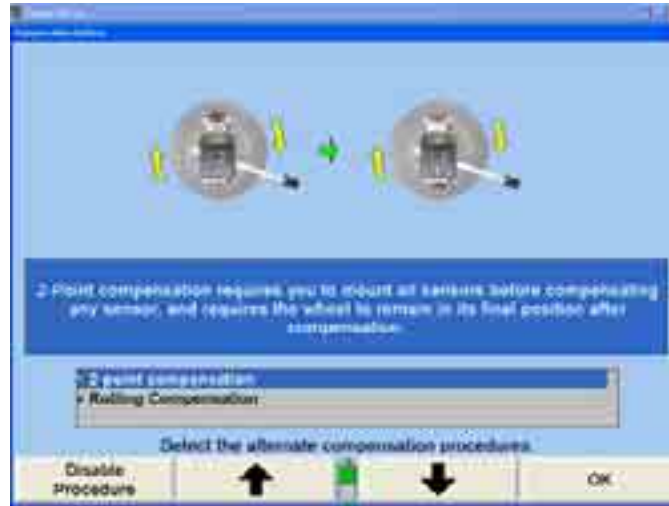
Plug in each sensor to be updated while holding down its compensation switch. If the sensor has a switch, hold down on the compensation button while turning on the switch. If the sensor "powers up" with the compensation switch held down, the "boot program" within it remains running. The green LED on the sensor blinks three times and then goes out to show this. The "Sensor Software Update" screen then shows "This sensor is ready for updating" next to an image of the sensor.

NOTE: The procedure is menu driven and all instructions appear as the program progresses. Simply follow the on-screen directions.
WinAlign will layer instruction windows throughout the procedure. Once familiar with the instructions, "Hide Instructions" can be selected to disable this function.

When all sensors are ready, press "Ready." The system updates the software in each sensor, showing a "progress indicator" beside each sensor. Several minutes are required to complete this. When the screen indicates that all sensors are finished, press "Exit" and the popup screen closes.

Setting up the Conventional Sensors Compensation Options

When “Conventional Sensors Compensation Options” is selected, the “Compensation Options” screen appears. The screen will depict only the appropriate compensation options based on the current sensor type.



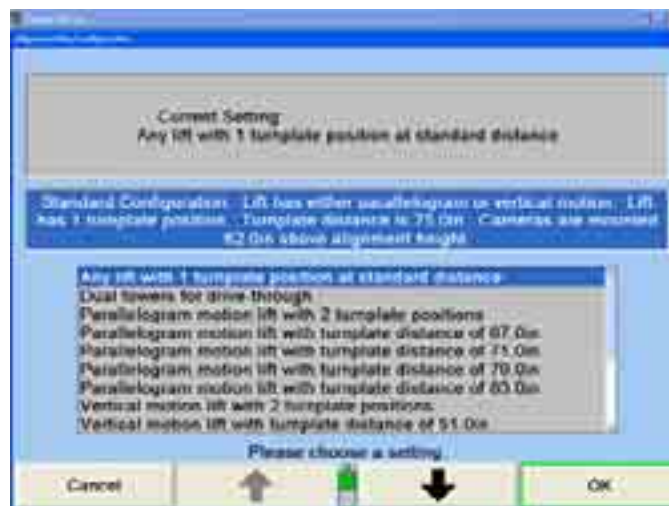
Press **↑** or **↓** until the desired compensation procedure is highlighted. Select “Enable Procedure” and a checkmark will appear next to that compensation option indicating that it will be available during the alignment procedure.

Press “OK.” The program stores the setting on the hard drive and returns to the “Aligner Set-Up” primary screen.

Setting up the Alignment Bay Configuration

DSP600 sensors can be adjusted to accommodate very specific height and distance configurations. This set-up option identifies many possible rack, height, distance, and turnplate configurations.

The “Alignment Bay Configuration” option will only appear if DSP400/600 sensors have been selected. To change the configuration, select “Alignment Bay Configuration.”





Press **↑** or **↓** until the desired DSP400/600 alignment bay configuration has been highlighted, and select “OK” to set the configuration.

Setting up the DSP400/600 Alignment Reference

DSP400/600 Sensors must be set as the default sensor type before “DSP400/600 Alignment Reference” appears as a Set-Up option.

When “DSP400/600 Alignment Reference” is selected, the “DSP400/600 Alignment Reference” popup screen will appear.



Press  or  until the desired DSP400/600 Alignment Reference is highlighted.

Press “OK” to set the default to the highlighted DSP400/600 Alignment Reference selection. The program will store the information on the hard drive and returns to the “Aligner Set-Up” primary screen.

Setting up the DSP400/600 Compensation Procedure

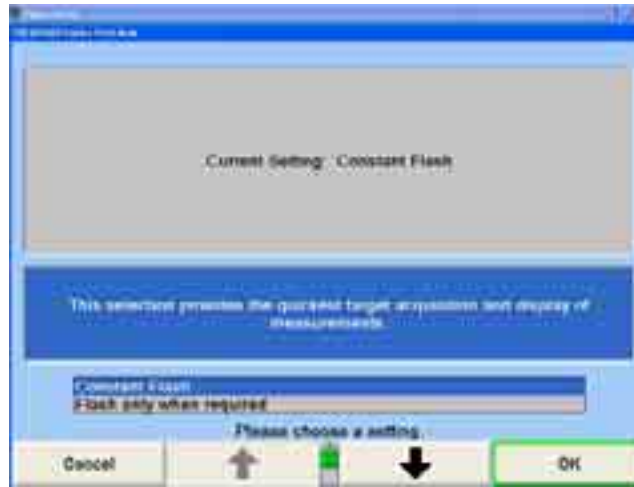
When “DSP400/600 Compensation Procedure” is selected, the “Select Default Compensation Procedure” popup screen will appear.



DSP400/600 Sensors offer three compensation options: Rolling Compensation, Jacking Compensation, and Rolling Compensation using Virtual View.

DSP400/600 Emitter Flash Mode

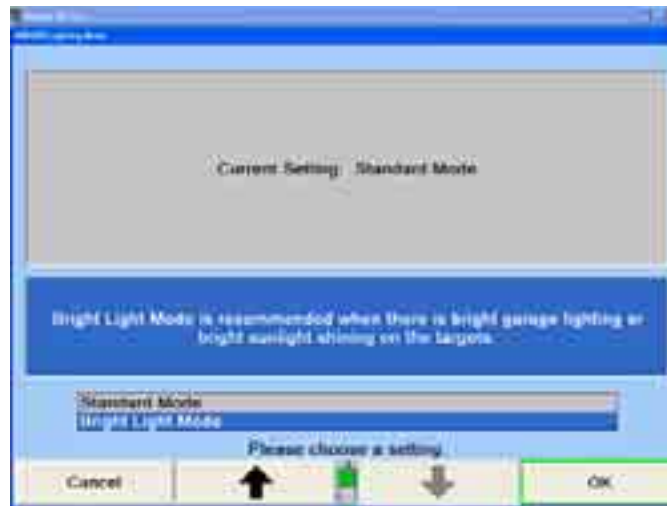
When “DSP600 Emitter Flash Mode” is selected, the “DSP600 Emitter Flash Mode” popup screen will appear.



Only two choices are available: “Constant Flash,” or “Flash only when required.”

Setting up the DSP600 Lighting Mode

When “DSP600 Lighting Mode” is selected, the “DSP600 Lighting Mode” popup screen will appear.



Two options are available. Select “Standard Mode” for normal shop conditions. Select “Bright Light Mode” when shop conditions have bright garage lighting, or intense sunlight/reflection which may disrupt the targets.

DSP600 Calibration Check Reminder

Select “DSP600 Calibration Reminder” to open the “DSP600 Calibration Reminder” popup screen. WinAlign® can automatically be set to remind the user to calibrate the sensors periodically every 90 days, every 180 days, or never.



Setting up the Cordless Channel Selection

NOTE: Cordless Channel is for use with DSP250/258HF/HFSS, DSP306/308HF/HFSS, and DSP506/508XF sensors.

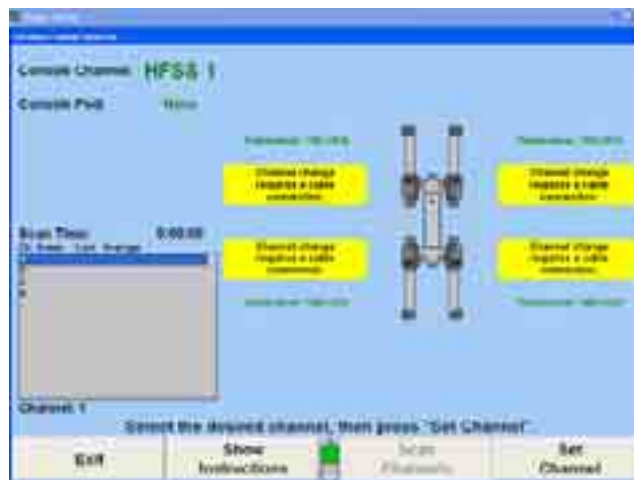
Cordless Channel is a feature that allows for two important functions:

- Setting the channels in the sensors and console.

- Scanning the channels for interference from other alignment systems, radio noise, and other external noise.

- Setting up the wireless remote indicator.

When Cordless Channel is selected, the Cordless Channel popup screen appears.



NOTE: The number of channels is dependent on the country specified in the Regional Settings Control Panel in Windows, and on the sensor type.

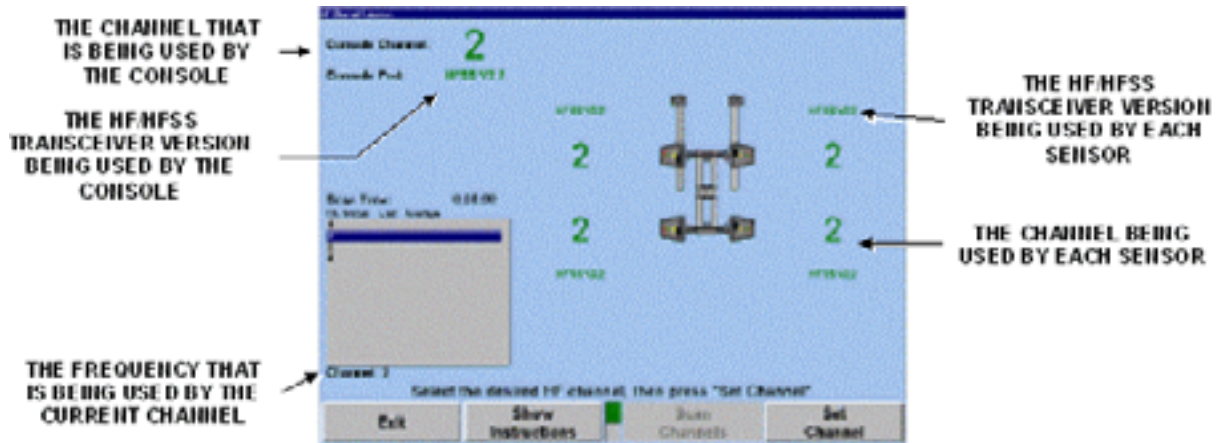
The screen will indicate “The sensor must be connected by cable” for sensors that are not already connected to the console by cable. Sensors must be connected to set channels, however, channels may be scanned at any time, with or without a cable connection.

NOTE: It is recommended that channels be scanned before setting channel. This applies to HF sensors only.

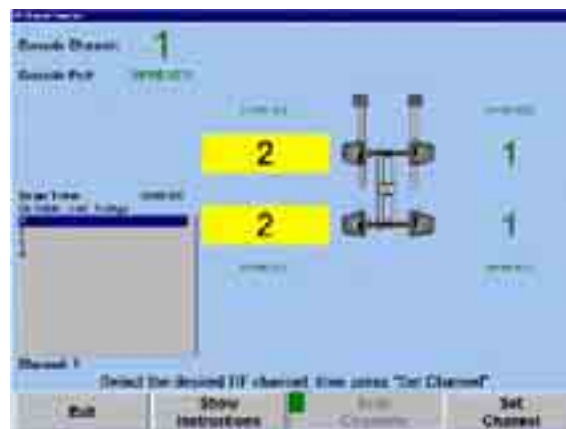
Selecting “Show Instructions” will produce a popup screen as shown below.



When the sensors are connected to the console with cables, the “HF Channel” screen will appear as shown below.



If there are sensors that are not set to the channel being used by the console, a screen similar to the following screen will appear.



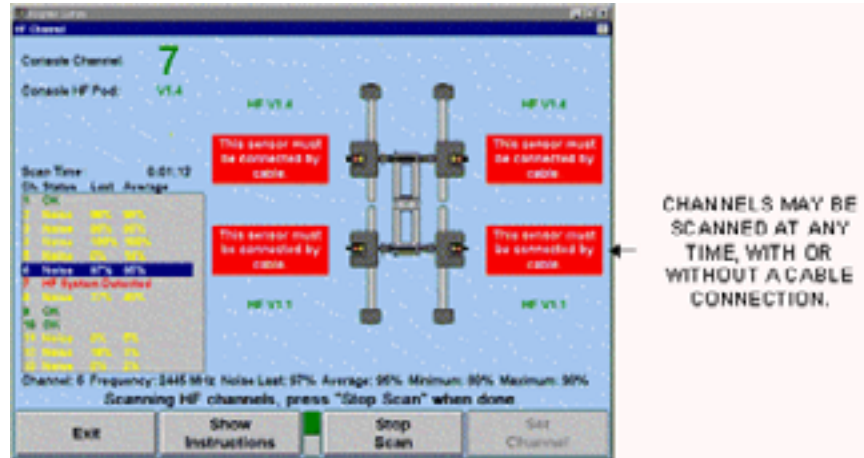
The yellow box around a channel indicates the associated sensor is not using the same channel as the console. This sort of situation may occur, for example, when sensors are borrowed from another aligner.

Scanning HF Channels

NOTE: Scanning Channels is also accessible from “Sensor Diagnostics.”

NOTE: The “Scan Channels” softkey is not available for HFSS Series Sensors.

When “Scan Channel” is selected, the screen will be updated as shown below.



A maximum of thirteen channels will be scanned for other aligners in the proximity, or for external noise including radio frequency interference.

The scanner will provide one of three conditions for each channel:

OK	Indicates the channel is clear and available for use.
HF SYSTEM DETECTED	Indicates that another WinAlign console is already using this channel. A WinAlign console can be detected only if it is currently on a measurement screen. The sensors for the other WinAlign console do not have to be turned on. DO NOT select a channel that is in use by another WinAlign console.
NOISE	Indicates the console is detecting some sort of signal on the channel that could interfere with the console’s HF communication.

The “**NOISE**” designator is intended for comparative diagnostics. The “Last” and “Average” percentages have meaning only if there is noise detected on a channel. The error percentage is calculated using the number of received transmissions/theoretical maximum transmissions during the sample time.

When using scan as a quick-check, the sample time may be as little as one scan through the channels, if that is all that is needed. If intermittent noise is expected or experienced, a scan may be run as long as needed to verify the existence and source of the noise.

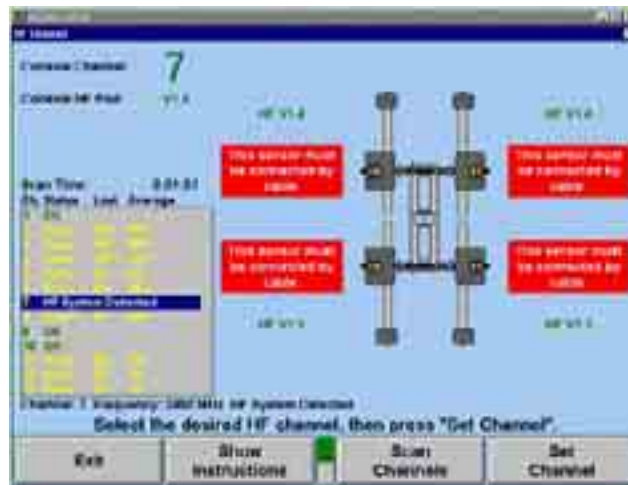
If several or all of the channels show that noise is detected, it is recommended to let the scan run for a period, while checking for causes of interference. For example, a nearby microwave oven that is being used will cause most or all channels to be noisy. While running the scan, if a microwave that is in use is turned off, the diagnostic window may indicate that the channels have become clear. This is shown by the error percentage in the “Last” column dropping to 0, and the “Average” column percentages going down.

When a large number of HF channels are found noisy, the following warning appears when the scan is stopped.



It is recommended that other sources of noise in the area be checked by powering down the suspected sources and watching the channel indicators on the screen.

When the scan is stopped, the channel will move back to the current console channel being used as shown:

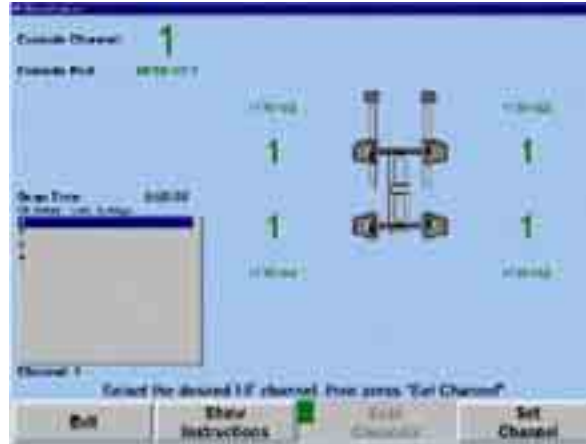


Setting HF/HFSS Channel

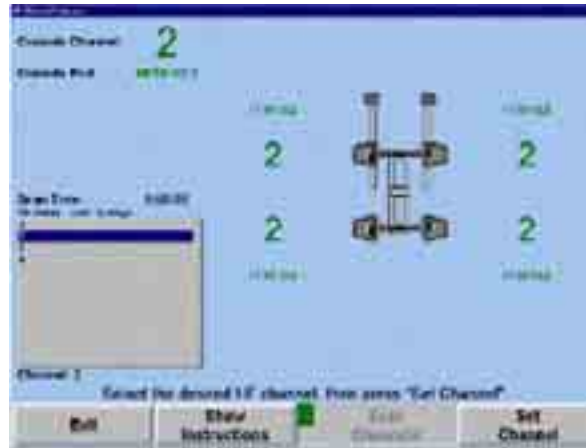
NOTE: It is recommended that a scan be run before selecting a channel for Set-Up. Without using scan prior to setting channels, a channel that is already in use, or a noisy channel can inadvertently be selected.

NOTE: To set HF/HFSS Channels, the sensors must be connected with cables.

To change the console and sensor HF channel, highlight an available channel as shown below.



Select “Set Channel.” The console and sensors will be set to the selected channel as shown below.



Setting up the Cordless Channel for the Wireless Remote Indicator

The optional wireless remote indicator requires an XF2 pod (second generation XF pod).

Select “Cordless Channel Selection” to synchronize the channel between the wireless remote indicator and the XF2 pod.

The console channel will be displayed along with the current connected pod version.



Connect the remote indicator to the console using a Burndy cable.

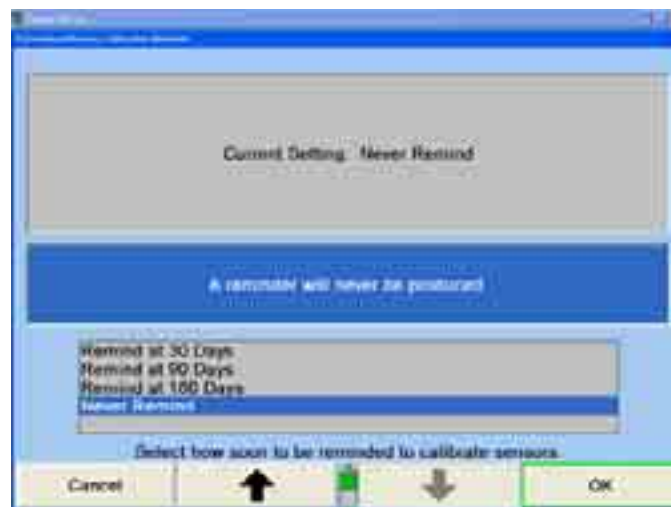
The window will display the current remote indicator version and channel. Choose the same channel from the numeric list and select “Set Channel.” The screen will display the following information:



Select “Exit” to return to the main Setup screen.

Setting the Conventional Sensor Calibration Reminder

Select “Calibration Reminder” to open the “Calibration Reminder” popup screen.



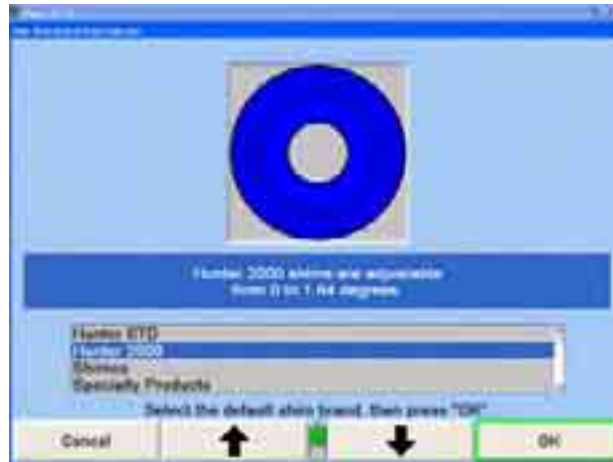
WinAlign can be set to automatically remind the user to calibrate the sensors periodically every 30 days, 90 days, 180 days, or never.



4.7 Power Tools

Power tools settings can be adjusted for rear shims, front bushings, tools and kits, and virtual view settings.

Setting up the Rear Shim Default Brand

When “Rear Shim Default Brand” is selected, the “Rear Shim Default Brand Selection” popup screen will appear.

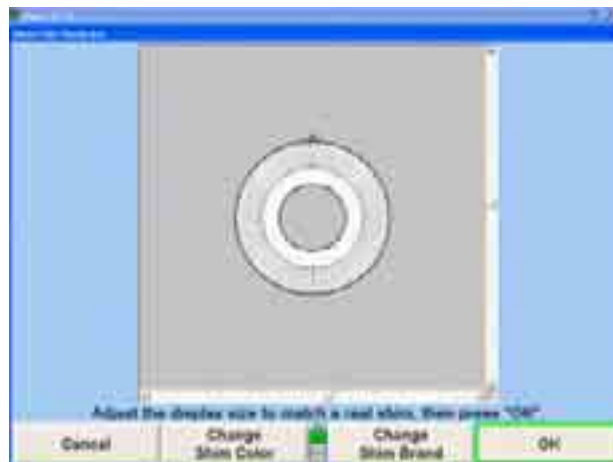


Press  or  until the desired shim is highlighted.

Press “OK” to set the default to the highlighted shim selection. The program will store the information on the hard drive and returns to the “Aligner Set-Up” primary screen.

Setting up the Rear Shim Display Size

When “Rear Shim Display Size” is selected, the “Adjust Shim Display Size” popup screen will appear.



The screen will display the default shim.

Press “Change Shim Color” and/or “Change Shim Brand” to select the desired shim.



Press “Make Shim Wider,” “Make Shim Narrower,” “Make Shim Shorter,” or “Make Shim Taller” to adjust the shim size.

Press “OK.” The program will store the information on the hard drive and returns to the “Aligner Set-Up” primary screen.

Setting up the Front Bushing Default Brand

When “Front Bushing Default Brand” is selected, the “Front Bushing Default Brand Selection” popup screen will appear.



Press  or  until the desired bushing is highlighted.

Press “OK” to set the default to the highlighted bushing selection. The program will store the information on the hard drive and returns to the “Aligner Set-Up” primary screen.

Setting up Virtual View

When “Virtual View Enable/Disable” is selected, the “Virtual View Enable/Disable” popup screen will appear.



Press “Enable Virtual View” to enable “Virtual View.”

OR

Press “Disable Virtual View” to Disable “Virtual View.”

Press “OK” to set the default to the “Virtual View” selection. The program will store the information on the hard drive and returns to the “Aligner Set-Up” primary screen.

Setting up Virtual View Caster Steer

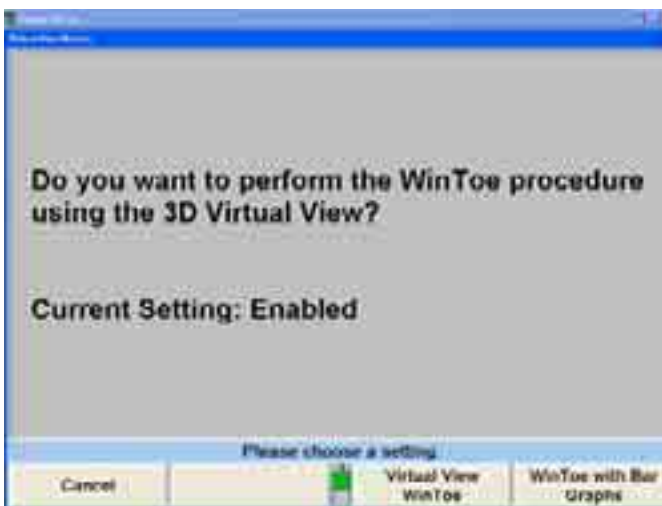
When “Virtual View Caster Steer” is selected, the “Virtual View Caster Steer” popup screen will appear.



Press “Virtual View Caster Steer” to perform the caster steer while remaining in Virtual View. Press “Caster Steer with Bar Graphs” to perform the caster steer using the conventional bar graphs.

Setting Up Virtual WinToe®

Select “Virtual View WinToe” to enable or disable the Virtual View version of WinToe.



Enable the setting by selecting “Virtual View WinToe.” Conventional WinToe can be enabled by selecting “WinToe with Bar Graphs.”

Setting up Live or Manual Ride Height

Select “Live or Manual Ride Height” to choose between automatically entered ride height values or manually entered ride height values.

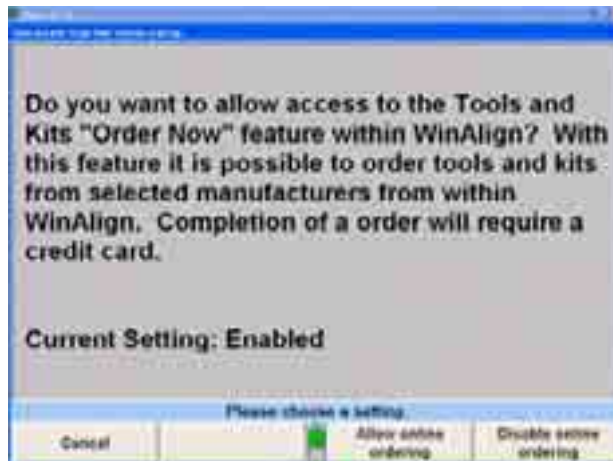


Live ride height requires the special ride height fender-mounted targets that measure the differences between the axis of rotation (spindle) and the wheel well. Select “Live Ride Height” to enable, otherwise ride height values must be manually entered.

NOTE: If Virtual View is enabled, ride height may be viewed in bar graph or virtual view form.

Setting up Tools and Kits Internet Ordering

When “Tools and Kits “Order Now” Internet Ordering” is selected, the “Tools and Kits “Order Now” Internet Ordering” popup screen will appear.





Press “Allow Online Ordering” to access a tools and kits online ordering page within WinAlign®. Selected manufacturer’s products can be directly ordered from within the program. Pressing “Disable Online Ordering” will disable this function.

4.8 Inspection

When “Select Inspection Mode” is chosen, the “Inspection Mode Selection” popup screen will appear.



Choose either the “Part List Inspection” or “Point and Click Inspection” mode. Press  or  to highlight the desired entry. Press “OK” to set the default to the highlighted selection. The program will store the information on the hard drive and returns to the “Aligner Set-Up” primary screen.

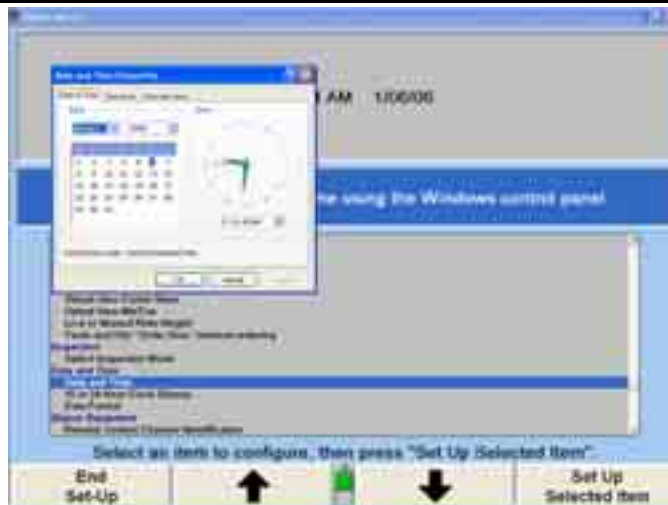
The “Part List Inspection” mode is a text only view of the inspection list with the parts listed by category.

The “Point and Click Inspection” mode integrates Hunter’s standard parts inspection list, with digital photos and 3-D parts drawings, all on the same screen.

4.9 Date and Time

This selection sets the computer clock and calendar using Windows Date and Time control panel. The Windows Date and Time panel will open and provide dialog box and options to enter the correct date, time, and time zone.

NOTE:	The Date and Time windows will vary depending on the operating system in use on the aligner.
--------------	--



The cursor appears in the month field of the “Date & Time” when the window opens. The month may be changed by clicking on the down arrow to the right of the month dialog box and selecting the appropriate month. Typing the appropriate month in the dialog box can also change the month.

Tab once and the cursor will move to the year field. The year can be changed by typing in the correct year in the dialog box or by using the arrow buttons to the right of the box.

Tab to move to the calendar box. Use the arrow keys, mouse, or other pointing device to select the appropriate date.

Tab to move to time dialog box. The time can be set by either typing the correct time or using the arrow keys to the right of the dialog box and scrolling to the correct time.

To set the appropriate time zone, select the "Time Zone" tab. The "Time Zone" window opens with the cursor positioned in the "Zone" dialog box. Use the down arrow to the right of the box to select the appropriate time zone. At the bottom of the screen is a check box to enable or disable automatic adjustment for daylight savings time. If the box is checked, Windows will automatically adjust the time changes for daylight savings time.



When all of the time and date options have been selected, press the "APPLY" button at the bottom of the window. Then select "OK" to exit Time and Date Set-Up.

Setting up the 12 or 24 Hour Clock Display

When "12 or 24 Hour Clock Display" is selected, the "12 or 24 Hour Clock Display" popup screen appears.



Press "12 Hour Clock Display" to set the clock on the logo screen to display in a 12 hour format.

OR

Press "24 Hour Clock Display" to set the clock on the logo screen to display in a 24 hour format.

The program will store the settings on the hard drive and return to the "Aligner Set-Up" primary screen.

Setting up the Date Format

When “Date Format” is selected, the “Date Format” popup screen will appear.



Press “MM/DD/YY” to display the date as month, day, and year or “DD.MM.YY” to display the date as day, month, and year.

The program stores the setting on the hard drive and returns to the “Aligner Set-Up” primary screen.

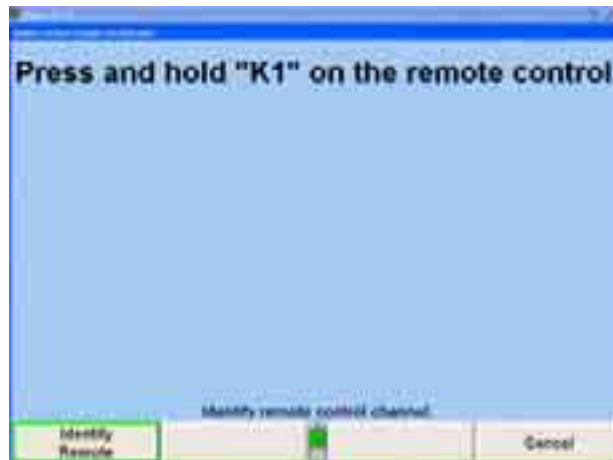
4.10 Aligner Equipment

Aligner equipment available for set-up includes a light pen (no longer available on 811 aligners), the remote control, file logging, and aligner shutdown.

Setting up the Remote Control Channel

When “Remote Control Channel Identification” is selected, the “Remote Control Channel Identification” popup screen will appear.

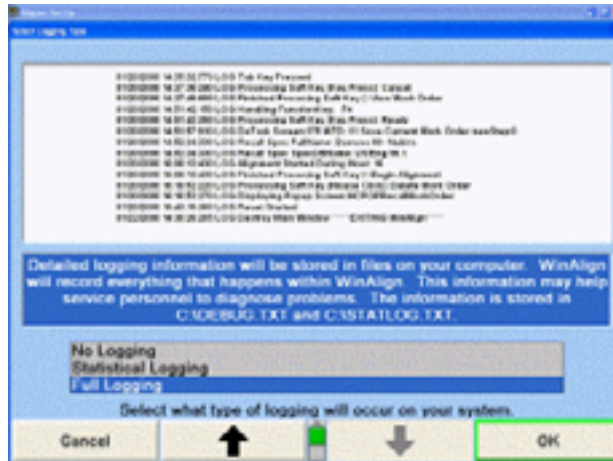
Press and hold “K1” on the remote control when prompted.





The display will prompt with the message, “The remote control channel has been successfully updated.” Select “OK” by pressing “K4” on the remote or by the softkeys on the keyboard. After setting the Remote’s identification, the aligner will return to the Aligner Set-Up screen.

Setting up the Select Logging Type

Logging can help the service representative to determine how this aligner is being used and diagnose problems. This information is saved to a file(s) on the computer or to a floppy disk by selecting “Copy Log files to Floppy Disk” softkey.



When “Select Logging Type” is selected, the “Select Logging Type” popup screen will appear. This selection will Set-Up the aligner program to use “No Logging,” Standard Logging” or “Full Logging.” Press  or  to highlight the desired entry. Press “OK” to set the default to the highlighted selection. The program will store the information on the hard drive and returns to the “Aligner Set-Up” primary screen.

The “No Logging” mode will not record any logging information on your system.

The “Standard Logging” mode will record statistical information on your system. This information will allow the service representative to determine how your aligner is being used. The information is stored in C:\STATLOG.TXT.

The “Full Logging” mode will record statistical and debugging information on your system. This information will allow the service representative to determine how your aligner is being used and to diagnose problems. The information is stored in C:\STATLOG.TXT and C:\DEBUG.TXT.

Setting up Shutdown Windows on Exit

The aligner can be completely shutdown by enabling “Shutdown Windows on Exit from WinAlign.”

When “Shutdown Windows on Exit from WinAlign” is selected the “Shutdown Windows on Exit from WinAlign” popup window will appear. Select “Shutdown Windows” to completely shutdown the aligner when exiting from WinAlign®. “Do Not Shutdown” will allow the aligner to be turned off the conventional method.

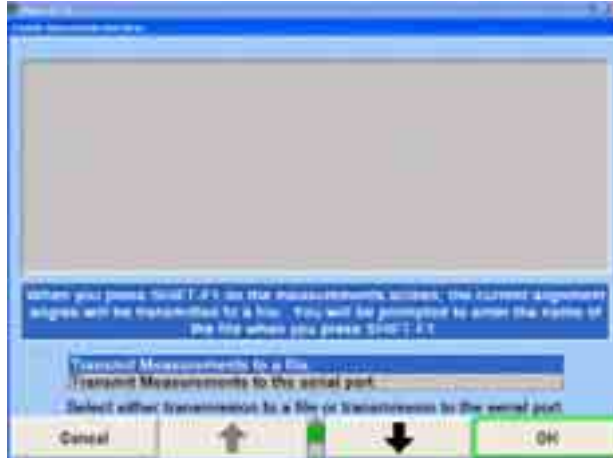


4.11 Transmitting Measurements

Transmit Measurements set-up selects the appropriate destination and format to transmit measurements and information for detailed analysis and data collection.

Setting up the Transmit Measurements Destination

When “Transmit Measurements Destination” is selected, the “Transmit Measurements Destination” popup screen will appear.



If “Transmit Measurements to a file” is selected, the aligner will save the measurement to a file on the computer or network.

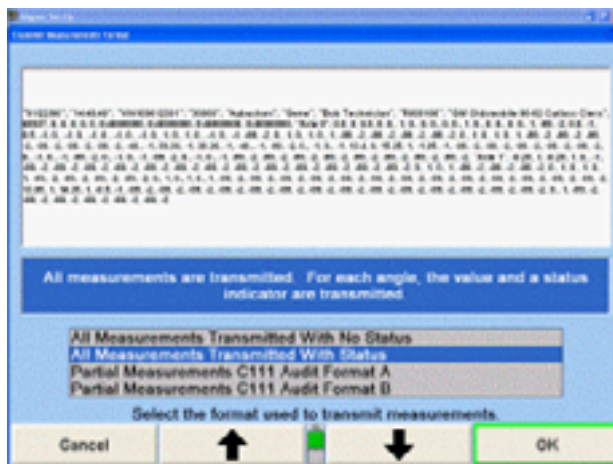
If “Transmit Measurements to the serial port” is selected, the aligner will send the measurements to the serial port. The measurements are sent at 9600 baud, no parity, 8 data bits, and 1 stop bit.


Press  or  to highlight the desired entry.

Press “OK” to set the default to the highlighted selection. The program will store the information on the hard drive and returns to the “Aligner Set-Up” primary screen.

Setting up the Transmit Measurements Format

When “Transmit Measurements Format” is selected, the “Transmit Measurements Format” popup screen will appear.



Press  or  to highlight the desired entry.

If “All Measurements Transmitted With No Status” is selected, the aligner will transmit only the value of the angle.

If “All Measurements Transmitted With Status” is selected, the aligner will transmit the value and a status indicator of each angle.

If “Selected Measurements Transmitted With No Status” is selected, the aligner will transmit only the value for each angle.

If “Selected Measurements Transmitted With Status” is selected, the aligner will transmit the value and status indicator for each angle.

If “Partial Measurements C111 Audit Format A” is selected, the aligner will transmit measurements in a format that is required by Ford.

If “Partial measurements C111 Audit Format B” is selected, the aligner will transmit measurements in a format that is required by General Motors.

If “XML Format” is selected, the aligner will transmit the measurements in an XML language format.

Press “OK” to set the default to the highlighted selection. The program will store the information on the hard drive and returns to the “Aligner Set-Up” primary screen.

4.12 Work Management

Work Management set-up selects basic formats for the work order, and provides the option of building a customized work order.

Setting up the Work Order Format

When “Work Order Format” is selected, the “Work Order Format Selection” popup screen appears offering a choice of styles in work order formats as follows:

- | | |
|-------------------------|---|
| Format 1: | This format includes work order items appropriate for most US shops, including “State.” The customer is listed with the given name first, then the family name. |
| Format 2: | This format has work order items appropriate for most non-US shops. The customer name is listed with the family name first, then the given name. |
| Format 3: | This is a concise format for non-US shops. The customer name is listed with the family name first, then the given name. |
| Format 4: | This format has work order items appropriate for most shops in the Far East/Asia. Formatting of customer name and address follow Far East conventions. |
| I-Shop Shop Management: | This option enables “I-Shop Compatible” I-Shop Shop Management. |
| Custom Forms (Default): | Enables Automatic Recall Shop Management and allows the user to customize work order format. |

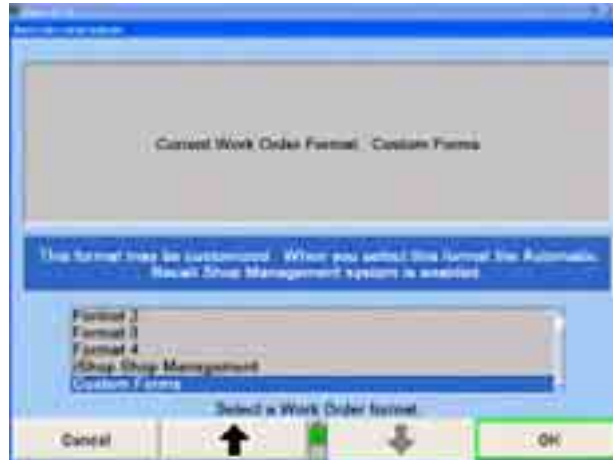
The popup screen indicates the current work order format. The default setting is for “Custom Forms.” To change formats, use the arrow keys to highlight the appropriate work order format and select “OK.”

Setting up the Custom Work Order Format

The Custom Work Order Format is the default Work Management setting.

From “Aligner Set-Up,” highlight “Work Order Format” and select “Set-Up Selected Item.”

From the “Work Order Format Selection,” select “Custom Forms.”



Selecting “Custom Forms” allows you to format the work order to include and determine the fields of your choice. A “✓” to the left of the field identifies that the field is being included on the work order. A “+” to the left of the field identifies that the field requires a mandatory entry before it is completed.

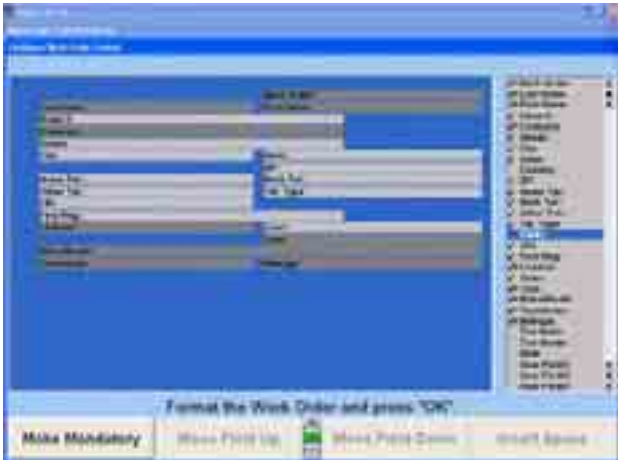


In the “Configure Work Order Format” screen, the pointing device or the arrow keys can be used to select a work order field.

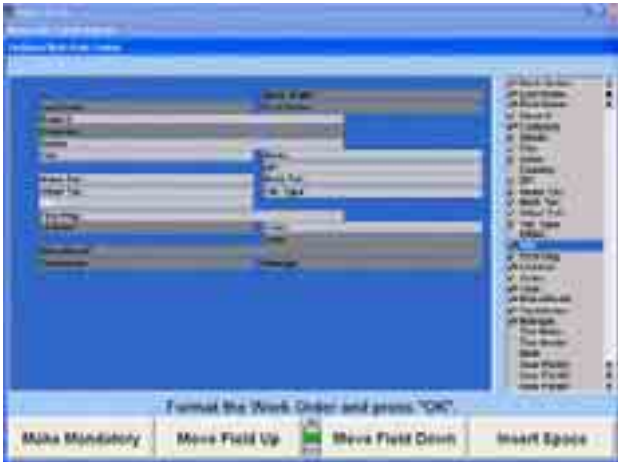
To include a field that is currently not included on the work order, highlight the desired field in the list box and select “Include Field.”



To make a field mandatory or to include a field but not require mandatory entry, highlight the desired field and select “Make Mandatory/Make Non-Mandatory.”

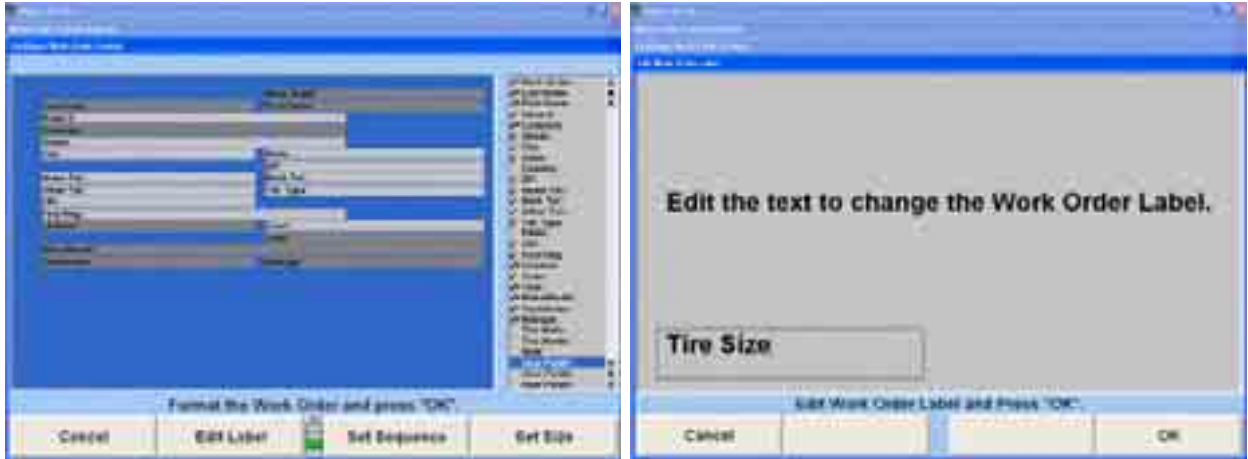


To rearrange the work order format, you may select to “Move a Field Up” or “Move a Field Down.” Spaces can also be inserted into the work order by selecting “Insert Space.”

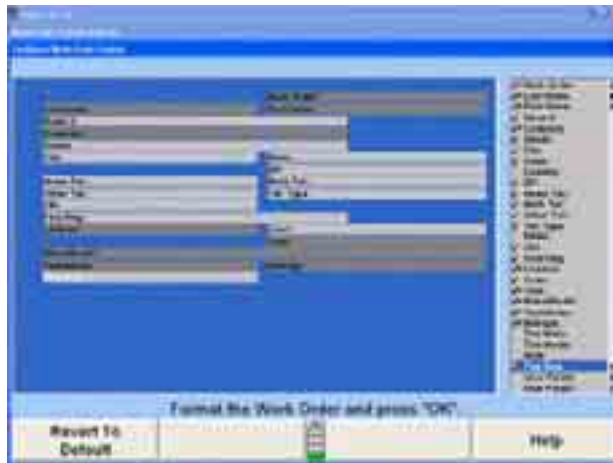


There are also four user editable fields that can be customized for any data entry required.

Highlight the field to be edited, and select “Edit Label.” The “Edit Work Order Label” screen will appear. Type in the desired label and select “OK.” The following example created a label for “Tire Size” to be used with the other tire identification fields.



When work order format changes are completed, select “OK.” To return the work order format to the initial default Set-Up, select “Revert To Default.”



4.13 Logon

Setting up the Logon Option

When “Logon: Enable/Disable” is selected, the “Logon” popup screen appears.



NOTE: The “User” field is preset to “MANAGER” and cannot be changed. Only the password may be entered.

If the password is correct, the “Logon Enable” popup screen will appear with the current setting on the screen.



Press “Enable Logon” to enable this option. This will require users to log on to the aligner program to perform an alignment. A popup screen will appear reminding you to change the password for the “MANAGER” logon.

Press “OK.”

NOTE: After logon is enabled, the password for the “MANAGER” logon should be changed from the initial password using the “Logon Password” function of Set-Up. Please record the new password for future use.

OR

Press “Disable Logon” to disable this option. Users may perform alignment without having to log on.



The program stores the setting on the hard drive and returns to the “Aligner Set-Up” primary screen.

Setting up the Logon Registry

NOTE: This item appears only when the “MANAGER” has logged on.

When “Logon Registry” is selected, the “Edit User Registry” popup screen appears with the current list of users displayed.



Press  or  to highlight the desired entry. Press “Edit User” to make changes to the highlighted entry. The “Edit User Logon” popup screen will appear.



Press “Select Next Field” or “Enter” to move the cursor to the field or fields to be altered. Make the desired changes, and then press “OK.” The screen will return to the “Edit User Registry” popup screen.

OR

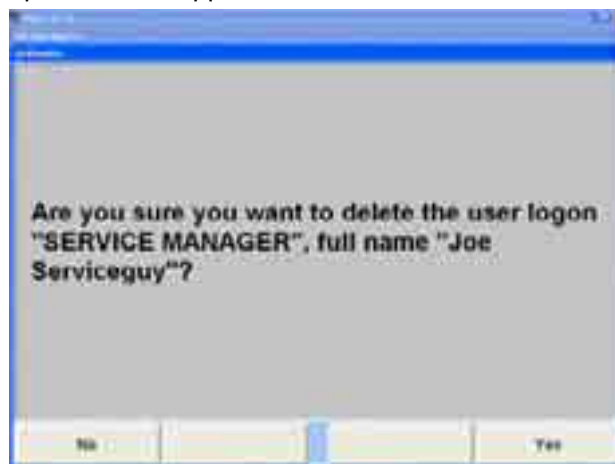
Press “Add User” to add a user to the registry.



Enter the information requested, and then press “Select Next Field” or “Enter” to move the cursor to the next field. Select “OK,” after all fields are complete. The screen will return to the “Edit User Registry” popup screen.

OR

Press “Delete User” to delete the highlighted entry from the logon registry. A confirmation popup screen will appear.



Press “Yes” to delete the entry from the logon registry or press “No” to keep the entry in the logon registry.

The screen will return to the “Edit User Registry” popup screen.

Press “Exit.” The program returns to the “Aligner Set-Up” primary screen.

Setting up the Logon Password

NOTE: This item appears only when Logon is enabled.

When “Logon Password” is selected, the “Change Password” popup screen appears.



In the “Old Password” field, enter the old password, and then press “Select Next Field” or “Enter” to move the cursor to the next field.

In the “New Password” field, enter the new password, and then press “Select Next Field” or “Enter” to move the cursor to the next field.

In the “Verify Password” field, enter the new password again, and then press “OK.” If the entries in the “New Password” and “Verify Password” fields do not match, an error message will appear asking to re-enter the password.

If the entries in the “New Password” and “Verify Password” fields match, the program stores the setting on the hard drive and returns to the “Aligner Set-Up” primary screen.

NOTE: A password is not required for users.

Setting up Automatic Backup Options

NOTE: This item appears only when Logon is enabled. Even though “Automatic Backup” may be set, manual backups should still be performed on a regular basis.

Highlight “Automatic Backup Options.”

Press “Set-Up Selected Item” to open the popup screen to Set-Up “Automatic Backup Options.”

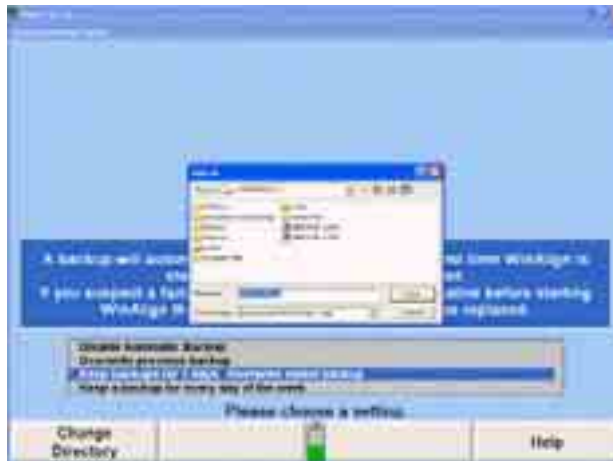


Press  or  to highlight the desired entry.

Press “OK” to set the default to the highlighted selection. The program will store the information on the hard drive and returns to the “Aligner Set-Up” primary screen.

To change the directory where the Autobackup is stored, press “Change Directory.”

A Windows dialog box will appear with the current backup data files location. Select the new location for the backup data files and press “Save” on the dialog box.



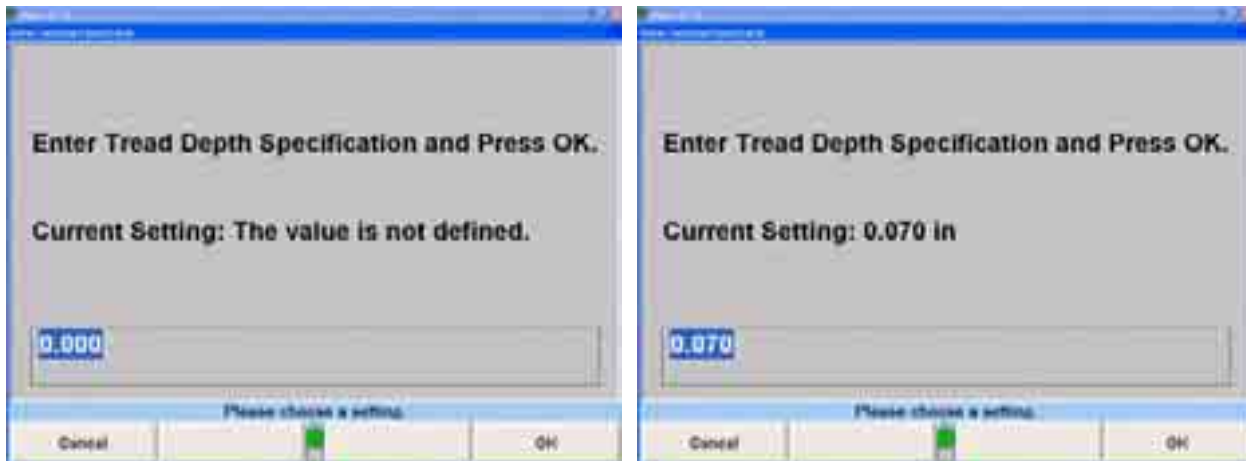
Press “OK” after all the desired changes have been made to exit Set-Up and save changes.

4.14 Tread Depth

Tread Depth set-up defines exact minimum tread depth specifications. If this is not filled in, the minimum setting remains undefined.

Setting up the Defined Tread Depth Specification

When “Defined Tread Depth Specification” is selected, the “Defined Tread Depth Specification” popup screen will appear.



Type in a tread depth to be used as the minimum specification.

Press “OK” to set the tread depth as the default. The program will store the information on the hard drive and returns to the “Aligner Set-Up” primary screen.

5. Detailed Operation Information

5.1 Primary and Popup Screens

There are four primary screens used during a typical alignment job. They are:

- Vehicle Specifications
- Vehicle Measurements and Adjustments
- Vehicle Inspection
- Work Management

When a primary screen is showing, there is only a single “title bar” across the top of the display. For example, see the following “Vehicle Measurements and Adjustments” primary screen.



You can change the display to one of the other primary screens by pressing a softkey

OR

Press the  or  on the keyboard.

OR

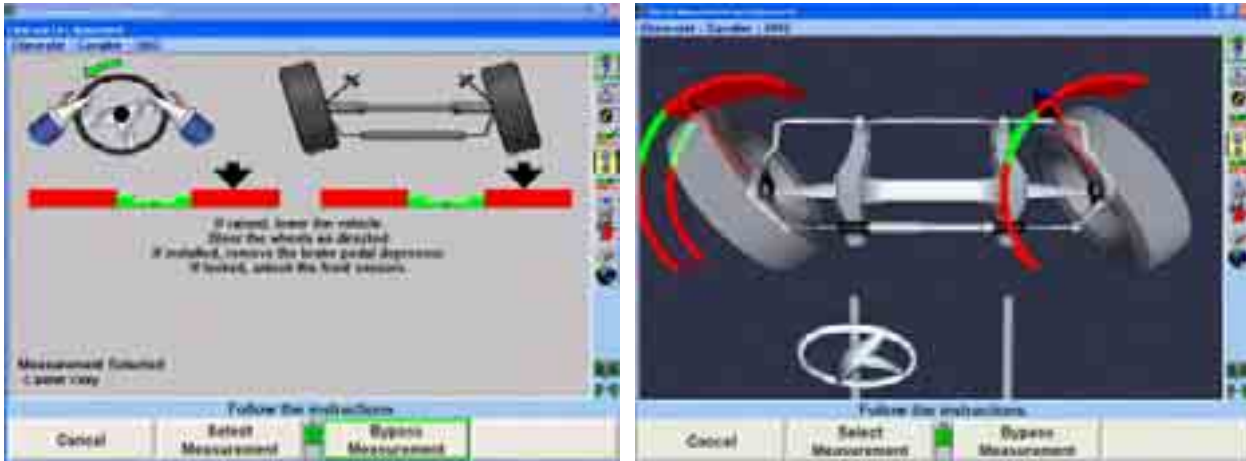
Select the appropriate icon from the Procedure Bar.

Since there are four primary screens, only four softkeys are needed to do this. For example, when showing the “Vehicle Measurements and Adjustments” primary screen, the second row of softkeys are:



Popup screens are so named because they “popup” over primary screens or over other popup screens. To perform an operation, such as recalling specifications from the database or measuring caster, press the softkey with the corresponding label. A popup screen pops up over the current screen to perform that operation, and the softkeys change to those needed to support the operation.

For example, the “Measure Caster” popup screen pops up over the “Vehicle Measurements and Adjustments” primary screen.



When a popup screen appears, the only actions available are:

- Perform the operation
- Skip the operation (on some screens)
- Cancel the operation (on most screens)

When the operation is complete, skipped, or canceled, the popup screen disappears, revealing the primary screen from which it appeared.

Two very important aspects of this scheme are:

The popup screen does not “hide” the screen over which it pops up. It leaves the title bar of that screen exposed, so you can view the “context” in which that popup screen is used.

The popup screen has a softkey menu that supports only the operations required by that screen. This greatly simplifies the menus of the primary screens, and makes it much easier to control the operation of any popup screen.

5.2 Log On

The “Log On” option provides a way to identify the user. The primary use of log on is to allow a user to customize alignment program settings according to his or her preferences in the setup program. For example, Bob logs on to WinAlign and changes the toe display format to degrees, performs a number of alignments, and then logs off. When Bob logs on in the future, his toe display format setting will be restored. All other users will not be affected by Bob’s format preference.

NOTE: The “Log On” option is not a security system. It is only a way to identify users and allow the user to customize the settings.

The log on capability can be enabled or disabled in the setup program. The log on default is “Disabled.”

Types of Log On

The log on feature supports two different log on types; manager log on and user log on.

A user is anyone who performs alignments using the WinAlign program. A log on identifies the specific alignment program structure requested by the user.

The manager log on is typically used by one person. This person has administrative privileges within the system.

Manager Log On

There is only one log on “MANAGER.” The “MANAGER” log on can not be deleted or renamed and is typically assigned to the owner, service manager, or supervisor.

The “MANAGER” log on has more setup items than a user log on and is the only log on that can enable or disable the log on feature or add, change, or delete other log on users.

NOTE:	The password for the MANAGER is “ MANAGER. ” After log on is enabled, the password for the “MANAGER” log on should be changed. Record the new password for future use.
--------------	--

User Log On

The “Log On” option supports multiple users. Typically, each alignment technician would be assigned and use their own user log on.

Setup Items

When a user who is logged on changes a setup item, the change affects only the program structure for that specific user. However, when a setup item is changed using the “MANAGER” log on, the change affects all users with a log on that have not set up the item selected by the manager.

For example, using the manager log on, Fred changes the toe display format to degrees and minutes, and then logs off. Jim has not set up the toe display format, so when he logs on, the toe display format will be degrees and minutes. Bob had already selected toe units in degrees so, when he logs on, the toe display format will be degrees.

Logging On

The log on feature does not distinguish between upper case and lower case letters for log on names or passwords. For example, if the password “ILOVEWINALIGN” is entered as “ILoveWinAlign,” this will be accepted as a valid password.

When log on is enabled, the “Begin Alignment” key on the logo screen is replaced with “Log On.”

Press “Log On.” The “Log On” popup screen will appear.



From the keyboard, enter user name in the “User” field.

Press “Enter” or “Select Next Field” to move the cursor to the “Password” field. Enter the password. For each character entered in this field, an asterisk (*) will appear. This prevents anyone from reading the password.

If the password is not correct, an error message will appear. Press “OK,” then re-enter the password.

When a user has logged on successfully, the logo screen will appear.

Logging Off

Resetting the aligner **will not** log off a user. Turning the alignment console off will log off a user.

To log off, press “Log Off” on the logo screen.

Log On Registry

When log on is enabled, only users that appear in the log on registry may log on to WinAlign. Users may be added or deleted from the log on registry by using the “Set Up Aligner” function. Only the “MANAGER” can add or delete from the log on registry.

The registry contains the following information for each user that has been assigned a log on name:

Log On Name	A short name used to identify the user. This name is what the user types into the “Log On” popup screen.
Full Name	The user’s full name. This name will appear on the Customer ID screen to identify the Technician and on the reset screen as the current user.
Password	A password to protect the user from having their identity misrepresented. Passwords are never displayed and can be left blank if desired.
User Number	A number that represents each user in the configuration database.

NOTE: A password can be changed by the individual user. Only the “MANAGER” may add, change, or delete users from the registry.

Log On Password

When log on is enabled, users that appear in the log on registry may log on to WinAlign. Users may change their password by selecting “Log On Password” from “Aligner Setup.”

5.3 Work Management Database

Work Management Overview

Work Management provides a database for storing work orders, customer identification, and vehicle identification.

Work Management also provides methods to store and recall customer and vehicle identification. This identification is then referenced by work orders.

If Work Management is enabled in Setup under the Common Alignment Preferences then all facets of Work Management are easily accessible after selecting “Begin Alignment.” Otherwise Work Management must be accessed within the alignment process.

The default format setting for Work Management is “Custom Forms.” The information that is entered and its arrangement/order in the Custom Forms format is editable within Setup (*refer to Setup for more information*).

Format 1 is also applicable for most U.S. shops.

The Work Management form contains three sections: Customer Information, Vehicle Information, and Work Order Information.

Customer Information includes the following:	Vehicle Information includes the following:	Work Order Information includes the following:
customer number	VIN	date created
first and last name	license	date changed
second contact name	color	work order number
company name	year	technician identification
address	make	vehicle mileage
home phone	model	note (this feature is added separately)
work phone	vehicle alignment specification	alignment procedure
other phone	ID	
telephone type		

NOTE: Mileage is stored in the work order and not in the vehicle identification section.

The “Work Management” primary screen shows a summary of the work order, as shown below. The information contained in the “Work Management” primary screen will depend on whether or not the work order has been edited.



Custom Forms (Default Format)

Entering Customer Information

Customer information can be entered on the “Edit Customer Identification” screen or “Edit Work Order” popup screen. The “Edit Customer Identification” screen provides a way to type information that will appear on a printout. The “Edit Work Order” screen does the same thing except the information is also saved so it can be recalled in the future.

The “Edit Customer Identification” popup screen (on the left) will appear at the beginning of the alignment procedure, only if “Edit Customer Identification” is selected in “Aligner Setup” under “Common Alignment Procedures.” The “Edit Work Order” popup screen (on the right) will appear at the beginning of the alignment procedure, only if “Work Management” is selected in “Aligner Setup” under “Common Alignment Procedures.”



“Edit Customer Identification” and “Work Management” cannot be selected at the same time from “Common Alignment Procedures.”

“Work Management” may be accessed within WinAlign without being selected in “Aligner Setup” under “Common Alignment Procedures.”

If ShopResults.NET™ has been enabled in setup a field for the email address will automatically be included in the Work Order.

Edit Customer Identification in Custom Forms

When “Edit Customer Identification” is enabled in “Aligner Setup” under “Common Alignment Procedures,” the customer information can be entered at the beginning of the alignment from the “Edit Customer Identification” popup screen.



If an error is made while entering the information, press the “Backspace” key to delete the last character entered.

Corrections can be made by moving the cursor to the incorrect character and re-entering. Press the right or left cursor arrow key to move the cursor to the incorrect character. Press “Delete” to remove the incorrect character, then press the correct character key.

To insert a character in the middle of a word, move the cursor to the character before the position and press the character to be inserted.

To remove a character, move the cursor to the left of the character and press “Delete.” The character will be removed and all other characters on the line will move to the left.

Press “OK” after entering the information. The “Recall Specifications” popup screen will appear.

Edit Work Order in Custom Forms

When “Work Management” is selected in “Aligner Setup” under “Common Alignment Procedures,” the customer information can be entered at the beginning of the alignment procedure.

If “Work Management” is not selected in “Aligner Setup” the work order can be edited after entering the vehicle specifications by selecting “Edit Work Order” from the “Work Management” primary screen.

Customer information can be entered at anytime during the alignment by selecting “Work Management” and selecting “Edit Work Order.”



The cursor indicates the position where characters will appear. The headings in blue identify fields that the Work Order may be recalled by. These fields are: V.I.N., work order, customer name, company, license number. The darker shaded areas are required information and the program will not proceed until those areas have been entered.

Enter the required information using the keyboard. Press “Enter” or “Tab” to advance to the next field. Press “Shift” and “Tab” to back up to the previous field.

If an error is made while entering the information, press the “Backspace” key to delete the last character entered. Corrections can be made by moving the cursor to the incorrect character and reentering. Press the right or left cursor arrow key to move the cursor to the incorrect character. Press “Delete” to remove the incorrect character, then press the correct character key.

To insert a character in the middle of a word, move the cursor to the character before the position and press the character to be inserted.

To remove a character, move the cursor to the left of the character and press "Delete." The character will be removed and all other characters on the line will move to the left.

Press "OK" after entering the information. The display will return to the screen where "Work Management" was accessed, or to the next display in the alignment procedure.

If the customer data being entered matches the data in the current database, the work order will automatically identify the number of matching work order(s) at the top of the screen. Entering additional information in the work order may narrow the selection of matching work orders.

After typing in the last name, Work Management associates work orders with the same last name. After typing in the first name it and pressing "Tab" or "Enter" on the keyboard Work Management narrows the number of work orders and automatically displays the associated work orders.

The "List Work Orders" softkey can also be selected to view the number of work orders identified by the yellow highlighted note at the top of the screen.



If a previous work order for the customer is found, press "Use Selected Item" to copy all of the customer's information to the current work order. Fill in any additional information required, then press "OK" to continue with the alignment process.



Listing Work Orders

“List Work Orders” may also be selected prior to entering any customer information to access the entire Work Management database. The “List Work Orders” screen will let you view, print, sort and search work orders in the database.



The drop-down menu on the lower left portion of the screen allows you to sort the work orders by many of the entries found on the edit screen such as:

work order	last name
company	zip code
home telephone number	vehicle identification number
license	make/model
technician	mileage
tire tread depth	date search

In addition to sorting the list, you can also perform searches on the list. For instance, if “Last Name” is selected, a box will appear for the customer name to be entered. Enter the customer's last name and press “Search” and only the work orders with that name will appear.


Highlight the appropriate work order and select “Use Selected Item.”



The upper portion of the display will list the customer information and vehicle alignment measurements for that work order. Press the “Print Summary” key on the second row of softkeys in order to create a printout of the results. Press “Use Selected Item” to create a new work order with the same customer information.

Adding a New Vehicle to a Customer ID

While viewing the “Edit Work Order” screen, you may need to specify an additional vehicle for a customer than what was previously aligned. To do this, begin by recalling the previous work order by pressing the “Use Selected Item” on the “List Order List” screen. This will fill in the “Edit Work Order” screen with customer information and the previous vehicle.

Select the “Recall Specs” button, , to access the “Recall Specifications” popup screen. Select the appropriate vehicle.

Edit the vehicle information for color and mileage, and press “OK” to continue with the alignment.

Press “End Management” to return to the “Work Management” primary screen.

Saving the Current Work Order in Custom Forms

In the typical case, you will have created a work order using the “Work Management” setup option and the Work Order will be saved automatically during the alignment process. If you have created a Work Order without using the setup option described in the instructions for “Entering Customer Information”, you will have to manually save the work order as follows:

Press “Work Management” on any primary screen. The “Work Management” primary screen will appear.

Press “Save Current Work Order.” The work order, with the associated customer and vehicle identification, will be stored on the hard drive.

NOTE:	If the current work order customer/vehicle identification was not recalled from the database, a new customer/vehicle identification is created and attached to the current work order. If the current work order customer/vehicle identification was recalled from the database, any customer/vehicle identification changes (for example a new address or phone number) would replace the original customer/vehicle identification. Any work orders attached to the original customer/vehicle identification will show the updated information.
--------------	--

Switching Between Reference and Current Work Orders in Custom Forms

All primary screens that can utilize the reference work order have a softkey that toggles between “Show Ref. Work Order” and “Show Current Work Order.”

When the current work order is active, pressing “Show Ref. Work Order” will make the reference work order active. This toggling softkey allows switching between the current and reference work order.

NOTE:	When the reference work order is active, the background screen color changes. A number of softkeys will be disabled (grayed out) since the reference work order can not be modified. Prompts and reminders will indicate the reference work order is active and can not be modified.
--------------	--

Exporting a Work Order in Custom Forms

Work Orders can be exported in CSV (comma delimited data) format for reading in a spreadsheet program such as Excel or in TXT (ASCII text) format for reading in any text editing program.

Select “Work Management” to access the “Export Work Order” softkey. When selected, it will bring up the entire work management database. Select the “Select All List Items” to select the entire database, or do a search on specific parameters to export only specific work orders, such as work orders performed by a specific technician, or type an individual work order number into the search field to export only one work order.

When the items to be exported are selected, press “Export Work Orders.” This will bring up a dialog box. Select the location to store the file, and the file format.

The file will contain all the information on the work order, but will not contain any specific adjustments or readings.

Deleting a Work Order in Custom Forms

Select “Work Management” to access the “Delete Work Order” softkey. When selected, it will bring up the entire work management database. Select the “Select All List Items” to select the entire database, or do a search on specific parameters to delete only specific work orders, such as work orders performed by a specific technician, or type an individual work order number into the search field to delete only one work order.

When the items to be deleted are selected, press the “Delete Work Order” key. This will delete all of the stored measurement data. If you stop at this point, the customer information such as vehicle type, customer name and address will still remain in the database so it can be recalled. If you also want to delete this other information, press “Delete Vehicle” to delete the vehicles owned by each customer and then press “Delete Customer” to delete the remaining data in the database such as customer name and address.

Managing the Database

The “Manage Database” softkey is available in for any work order format allowing data to be added, changed, or deleted from the database without affecting the current work order. The data can also be displayed in charts, filtered, and used to generate mailing labels and form letters.

Format 1

Format 1 is the alternate format for most U.S. shops. This is a fixed format which is not customizable. It also uses a different user interface than Custom Forms, as described below.

Entering Customer Identification

Customer information can be entered on the “Edit Customer Identification” popup screen, the “Add New Customer” popup screen, or the “Edit Work Order” popup screen.

The “Edit Customer Identification” popup screen will appear at the beginning of the alignment procedure, only if “Edit Customer Identification” is selected in “Aligner Setup” under “Common Alignment Procedures.”

The “Edit Work Order” popup screen will appear at the beginning of the alignment procedure, only if “Work Management” is selected in “Aligner Setup” under “Common Alignment Procedures.”

“Edit Customer Identification” and “Work Management” cannot be selected at the same time from “Common Alignment Procedures.”

“Work Management” may be accessed within WinAlign without being selected in “Aligner Setup” under “Common Alignment Procedures.” “Add New Customer” is accessed through “Work Management.”

Edit Customer Identification

When “Edit Customer Identification” is enabled in “Aligner Setup” under “Common Alignment Procedures,” the customer information can be entered at the beginning of the alignment from the “Edit Customer Identification” popup screen.



The cursor indicates the position where characters will appear. The darker shaded areas identify fields that the Work Order may be recalled by. These fields are: customer name, company, license number, technician, and mileage. Date of service also is a recall criteria and is automatically entered.

Enter the required information using the keyboard. Press “Enter” or “Tab” to advance to the next field. Press “Shift” and “Tab” to back up to the previous field.

If an error is made while entering the information, press the “Backspace” key to delete the last character entered.

Corrections can be made by moving the cursor to the incorrect character and re-entering. Press the right or left cursor arrow key to move the cursor to the incorrect character. Press “Delete” to remove the incorrect character, then press the correct character key.

To insert a character in the middle of a word, move the cursor to the character before the position and press the character to be inserted.

To remove a character, move the cursor to the left of the character and press “Delete.” The character will be removed and all other characters on the line will move to the left.

Press “OK” after entering the information. The “Recall Specifications” popup screen will appear.

If the customer data being entered matches the data in the current database, the work order will automatically identify the number of matching work order(s) at the top of the screen. Entering additional information in the work order may narrow the selection of matching work orders. To view the matching work orders, select “View Work Order.”



This function must be enabled in aligner setup.

Select “Service Programs” from the Logo screen, then select Set Up.

Scroll through the set up menu and select “Work Order Format.” From “Work Order Format,” select “Custom Forms.” Select “OK.”

Scroll through the set up menu and select “Common Alignment Preferences.” Enable “Work Management,” and select “OK.” Select “End Set Up.”

Adding a Note

If additional information needs to be added to the work order, select “Show Note.” When “Show Note” is selected, the “Work Order Note” screen will appear.



Anything can be typed in this area. Select “OK,” when finished and the display will return to the work order screen. The note will be hidden, shown only as a yellow box stating, “A note is attached.” Select “Show Note” again to display, or edit the information.

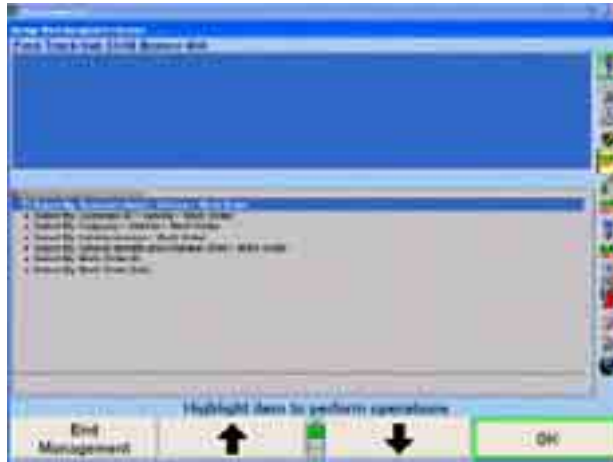
The note will be printed on the bottom of the Print Summary.



Recalling a Customer/Vehicle

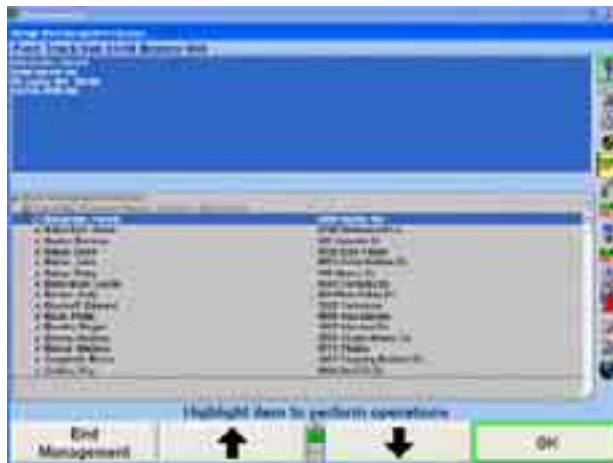
Use “Recall Customer” to recall an existing customer/vehicle into the current work order.



NOTE: Do not use “Add New Customer” if the customer already exists in the Customer Database. The current work order will not be associated with the existing customer/vehicle but with a duplicate customer/vehicle.

Press “Recall Customer” in the “Work Management” primary screen. The “Recall Customer/Vehicle” popup screen will appear, as shown below.

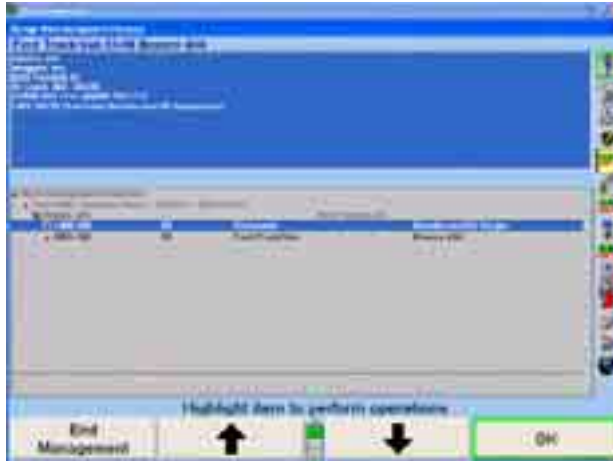


Press  or  to highlight the desired method of recalling the information, then press “OK.” The screen will change to display a list of customers sorted by name or company, vehicle license numbers, vehicle identification number, work order identifications, or work order dates, as shown below.



Press  or  to highlight the desired customer/vehicle, then press “OK.”

The following screen will display. If the customer has more than one vehicle, select the appropriate vehicle and press “OK.”



Once the customer/vehicle is identified, the customer/vehicle identification is recalled and attached to the current work order. The “Work Management” primary screen will appear, as shown below.



Select “Edit Work Order” to make any necessary changes or updates. Press “Start Work” to proceed with the alignment procedure.

Saving the Current Work Order

Press “Work Management” on any primary screen. The “Work Management” primary screen will appear.

Press “Save Current Work Order.” The work order, with the associated customer and vehicle identification, will be stored on the hard drive.

When Work Management is enabled in Aligner Setup, and “ExpressAlign” is enabled, the “Save Current Work Order” key will appear as part of the alignment procedure.



NOTE:

If the current work order customer/vehicle identification was not recalled from the database, a new customer/vehicle identification is created and attached to the current work order. If the current work order customer/vehicle identification was recalled from the database, any customer/vehicle identification changes (for example a new address or phone number) would replace the original customer/vehicle identification. Any work orders attached to the original customer/vehicle identification will show the updated information.

Recalling a Work Order

Press “Recall Work Order” in the “Work Management” primary screen. The “Recall Work Order” popup screen will appear, as shown below.



Press  or  to highlight the desired method of recalling the information, then press “OK.” The screen will change to display a list of customers sorted by name or company, vehicle license numbers, vehicle identification number, work order identifications, or work order dates, as shown below.



Continue making selections until the desired worker order is chosen. The selected work order will become the active work order.

Switching Between Reference and Current Work Orders

All primary screens that can utilize the reference work order have a softkey that toggles between “Show Ref. Work Order” and “Show Current Work Order.”

When the current work order is active, pressing “Show Ref. Work Order” will make the reference work order active. This toggling softkey allows switching between the current and reference work order.

NOTE: When the reference work order is active, the background screen color changes. A number of softkeys will be disabled (grayed out) since the reference work order can not be modified. Prompts and reminders will indicate the reference work order is active and cannot be modified.

Managing the Customer Database

The “Manage Database” softkey allows data to be added, changed, or deleted from the database without affecting the current work order. The data can also be displayed in charts, filtered, and used to generate mailing labels and form letters.

Adding a New Customer

Press “Add New Customer” on the “Work Management” primary screen. The “Recall Specifications” popup screen will appear, as shown below.



Select the customer’s make and model of vehicle. *Refer to “Vehicle Specifications.”* When the vehicle has been identified to the aligner, the “Edit Work Order” popup screen will appear with the vehicle information added, as shown below.

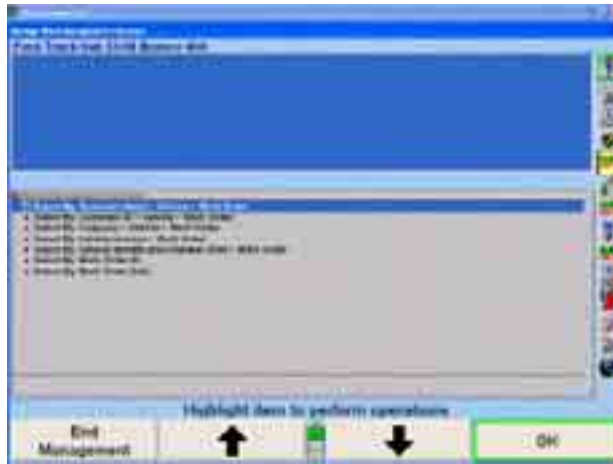


Enter the desired information and press “OK.” The customer will be added to the database and the “Work Management” primary screen will appear.

OR

Press “Manage Database” on the “Work Management” primary screen.

The “Manage Work Management Database” popup screen will appear, as shown below.



Press “Add New Customer.” The “Edit Customer Identification” popup screen will appear, as shown below.



Enter the desired information, and then press “OK.” The “Recall Vehicle Specifications” popup screen will appear.

Identify the vehicle the customer owns. *Refer to “Vehicle Specifications.”* When the vehicle has been identified to the aligner, the “Edit Customer Identification” popup screen will appear with the vehicle information added, as shown below.

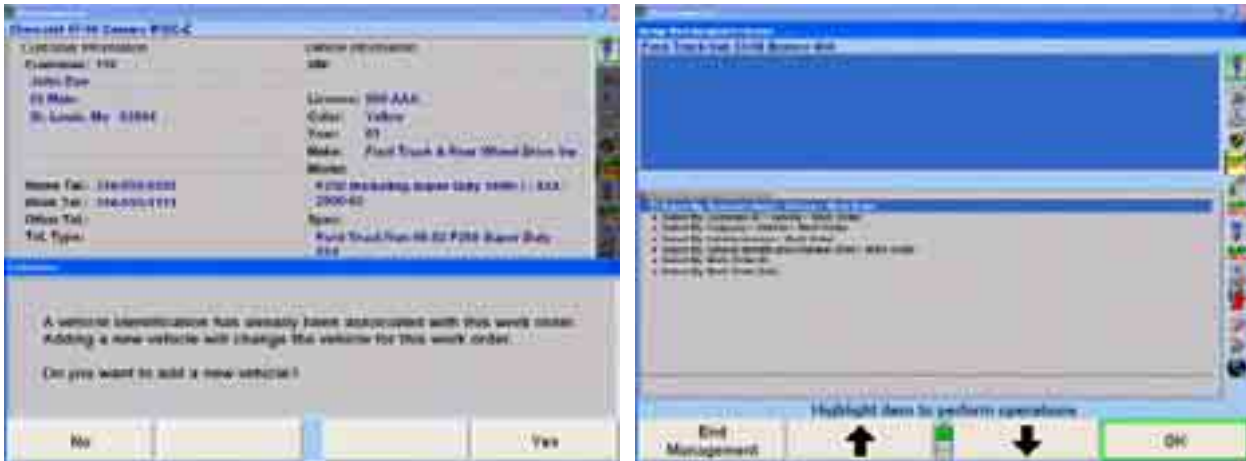




Enter any additional information, and then press “OK.” The “Manage Customer Database” popup screen will appear.

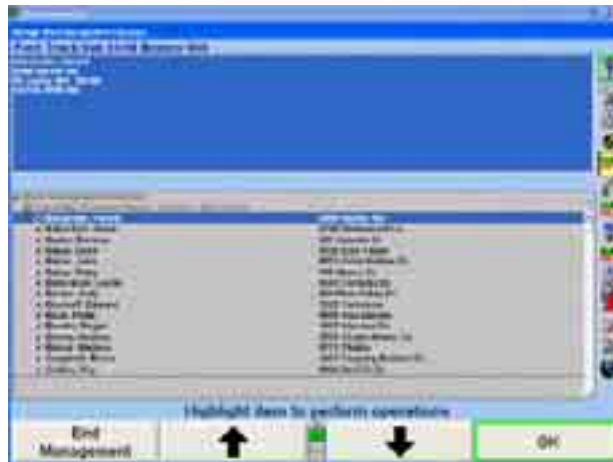
Press “End Management” to return to the “Work Management” primary screen.



Adding a New Vehicle to a Customer

Press “Manage Database” on the “Work Management” primary screen. The “Manage Work Management Database” popup screen will appear, as shown below.



Press  or  to highlight the desired method of listing customers by name, ID, or company, then press “OK.” The screen will display a list of customers, as shown below.



Press  or  to highlight the desired customer, then press “OK.” The screen will change to display a list of vehicles.

Press “Add New Vehicle.” The “Recall Specifications” popup screen will appear.

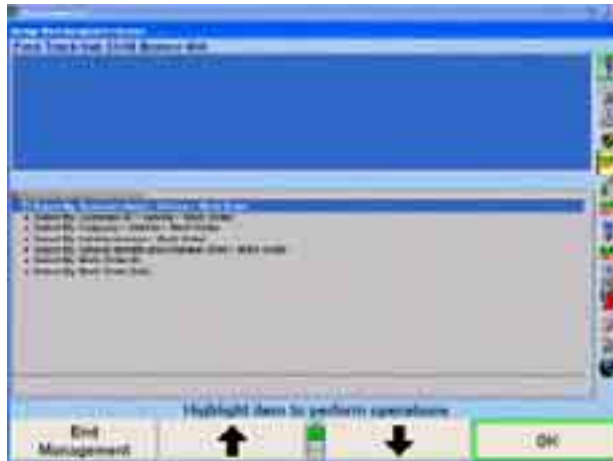
Identify the vehicle the customer owns. *Refer to “Vehicle Specifications.”* When the vehicle has been identified to the aligner, the “Edit Work Order” popup screen will appear with the vehicle information added.



Edit the vehicle information and press “OK.” The “Manage Work Management Database” popup screen will appear.

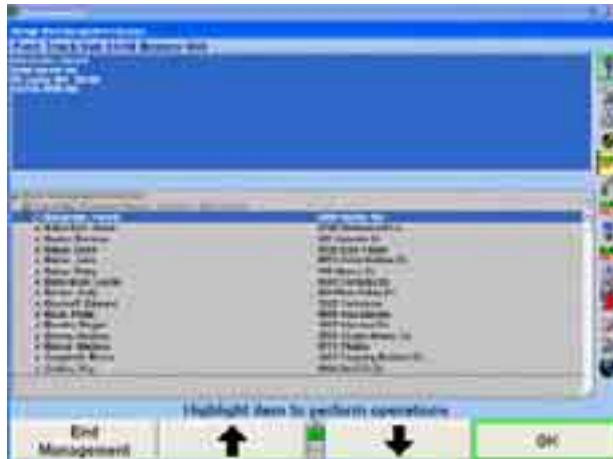
Press “End Management” to return to the “Work Management” primary screen.



Changing Customer

Press “Manage Database” on the “Work Management” primary screen. The “Manage Work Management Database” popup screen will appear, as shown below.



Press  or  to highlight the desired method of recalling the information, then press “OK.” The screen will change to display a list of customers sorted by name or company, vehicle license numbers, vehicle identification number, work order identifications, or work order dates, as shown below.





In a customer list, press  or  to highlight the desired customer, then press “OK.” A list of vehicles will be displayed. Press “Edit Customer ID.” The “Edit Customer Identification” popup screen will be displayed which allows the associated customer identification to be changed.





Press “OK” to save the entered changes. Press “End Management” to ignore any changes and return to the “Manage Customer Database” popup screen.

Deleting a Customer

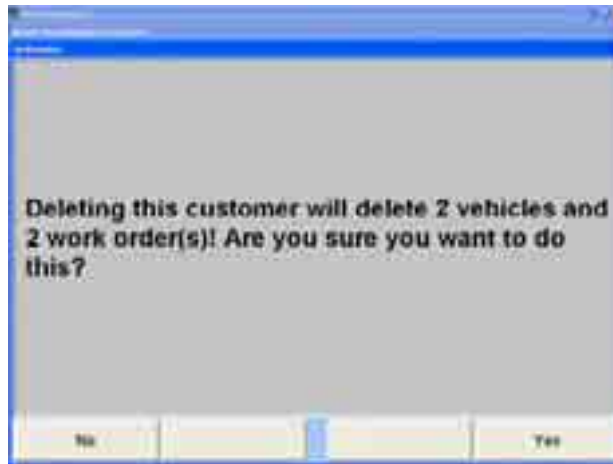
Press “Manage Database” on the “Work Management” primary screen. The “Manage Work Management Database” popup screen will appear.

Press  or  to highlight the desired method of recalling the information, then press “OK.” The screen will change to display a list of customers.

Press  or  to highlight the desired customer, then press “Delete Customer.”

NOTE: A customer must be highlighted for the softkey “Delete Customer” to appear.
--

A confirmation screen will appear with the statement “Deleting this customer will delete (X) vehicles and (X) work order(s)! Are you sure you want to do this?” as shown below.





Press “Yes” to delete the information or “No” to keep the information.

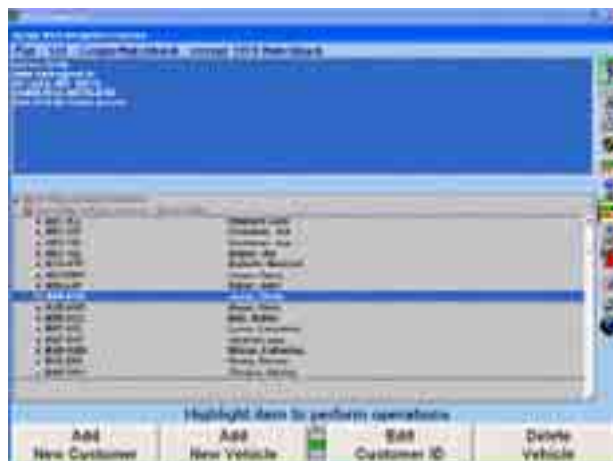
Press “End Management” to return to the “Work Management” primary screen.

Deleting a Vehicle

Press “Manage Database” on the “Work Management” primary screen. The “Manage Work Management Database” popup screen will appear.

Press  or  to highlight the desired method of recalling the information, then press “OK.”

Continue until the desired vehicle is highlighted, then press “Delete Vehicle.”



NOTE: A vehicle must be highlighted for the softkey “Delete Vehicle” to appear.

A confirmation screen will appear with the statement, “Deleting this vehicle will delete (X) work order(s)! Are you sure you want to do this?” as seen below.





Press “Yes” to delete the information or “No” to keep the information.

Press “End Management” to return to the “Work Management” primary screen.

Deleting a Work Order

Press “Manage Database” on the “Work Management” primary screen. The “Manage Work Management Database” popup screen will appear.

Press  or  to highlight the desired method of recalling the information, then press “OK.”

Continue until the desired work order is highlighted, then press “Delete Work Order.”



NOTE: A work order must be highlighted for the softkey “Delete Work Order” to appear.

A confirmation popup screen will appear with the statement “Are you sure you want to delete this Work Order?” as seen below.



Press “Yes” to delete the Work Order or “No” to keep the Work Order.

Press “End Management” to return to the “Work Management” primary screen.

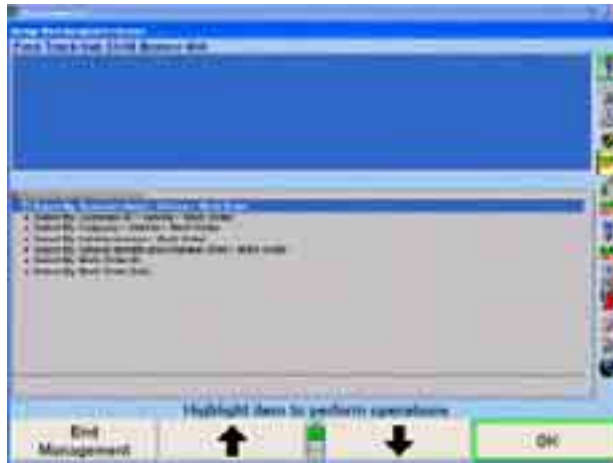
Filtering Data

Filtering is a method of instructing the database to display only certain customer, vehicles, and work orders. A filter will reduce the amount of data in the database you view. For example, to view only those customers whose last names begin with the letter “B,” create a filter to select customers whose last names begin with the letter “B.” Once a filter is selected, all subsequent actions taken in “Manage Database” will use that filter to choose records from the database (creating reports or form letters). When a filter is being used, a yellow box will appear in the upper right hand corner, as shown below.



To deselect a filter, press “Cancel Filter” on the “Manage Work Management Database” popup screen.

To filter data, press “Manage Database” on the “Work Management” primary screen. The “Manage Work Management Database” popup screen will appear.





Press “Edit Filter.” The “Create/Edit Filter Set” popup screen will appear, as shown below.



Create or recall a filter, then press “OK” on the “Create/Edit Filter Set” popup screen. The “Manage Work Management Database” popup screen, with a yellow box stating the filter is on, will appear in the upper right hand corner, as shown below.





Press  or  to highlight the desired method of recalling the information, then press “OK.” The screen will display a list of customers sorted by name or company, vehicle license numbers, work order identifications, or work order dates that meet the criteria specified in the filter.



Creating a Filter

Press “Add Criteria.” The “Edit Criteria” popup screen will appear with the cursor in the “Field Names” box, as shown below.



Press  or  to highlight the desired field name.

Press “Next Field” to move the cursor to the “Operations” box.

Press  or  to highlight the desired operation.

Press “Next Field” to move the cursor to “String” or “Date” box.

Enter the text string or date, and then press “OK.” The “Create/Edit Filter Set” popup screen will appear with the criteria in the criteria box.

If additional criteria is needed, repeat the above procedure.



To store a filter:

Press “Store Filter.” A popup screen will appear.



Enter the name of the filter, then press “OK.” The filter will be stored on the hard drive.

Recalling a Filter



Press “Recall Filter.” A popup screen will appear listing the stored filters.

Press  or  to highlight the desired filter, then press “OK.” The “Create/Edit Filter Set” popup screen will appear with the criteria in the criteria box.



Editing Criteria

Press  or  to highlight the desired criteria.

Press “Edit Criteria.” The “Edit Criteria” popup screen will appear with the cursor in the “Field Names” box.

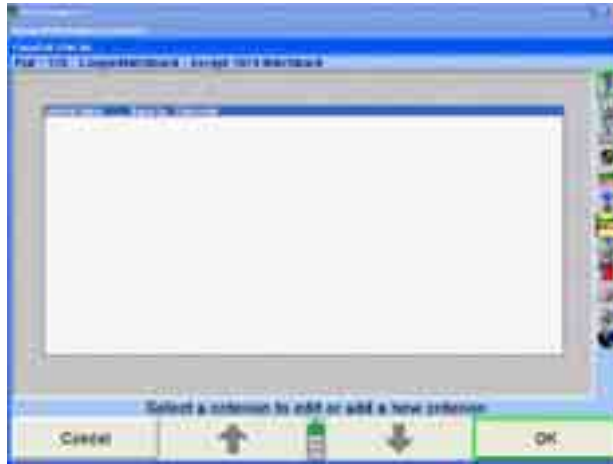
Press  or  to highlight the desired field name.

Press “Next Field” to move the cursor to the “Operation” box.

Press  or  to highlight the desired operation.

Press “Next Field” to move the cursor to “String” or “Date” box.

Enter the text string or date, and then press “OK.” The “Create/Edit Filter Set” popup screen will appear with the criteria in the criteria box.

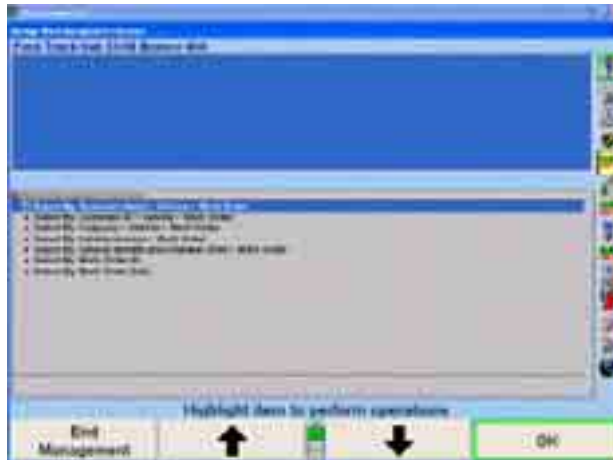


Creating Form Letters

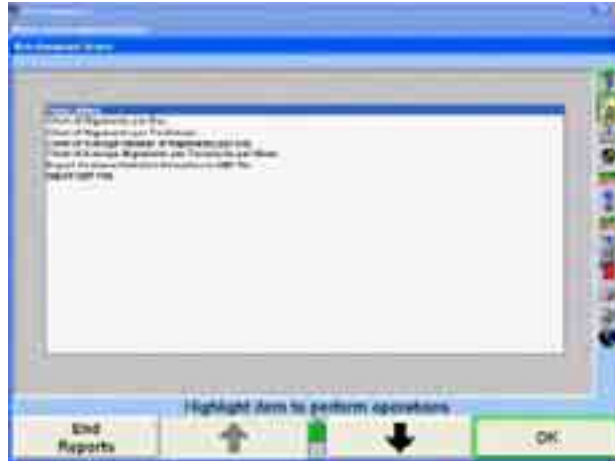
Work Management provides a word processing function so that letters can easily be created and sent to your customers.

NOTE: Running form letters on the entire database without a filter will produce a letter for every customer in the database. If the database is large, this will be **very** time consuming, and may not be cost-efficient.

To create a form letter, press “Manage Database” on the “Work Management” primary screen. The “Manage Work Management Database” popup screen will appear, as shown below.



Press "Make Reports." The "Work Management Reports" popup screen will appear, as shown below.



Press "OK." The "Form Letter" popup screen will appear, as shown below. A new letter can be created or a letter may be recalled.





To create a new letter:

Type the letter from the keyboard.

NOTE:	The text will automatically wrap in the box. Do not use the enter key to move text to the next line. Forced returns will make the layout of the printed letter incorrect. Press the enter key only when starting a new paragraph.
--------------	---

To recall a stored letter:



Press "Recall Form Letter." A popup screen will appear listing the stored form letters.

Press  or  to highlight the desired form letter, then press "OK." The "Form Letter" popup screen will appear with the letter in the box.

To add a field, move the cursor to the position where the field is to be added.

Press “Add Field.” The “Add a Field” popup screen will appear listing field names, as shown below.



Press  or  to highlight the desired field, then press “OK.” The “Form Letter” popup screen will appear with the additional field. Repeat this procedure to add more fields.

To delete a field:

Position the cursor directly in front of the field and press “Delete.”

OR

Position the cursor in the field name and press “Backspace” or “Delete.”

OR

Position the cursor directly behind the field and press “Backspace.”

To see how the letter will appear when printed, press “Print Sample.” An example of the letter will print.

To save a form letter:

Press “Save Form Letter.” The “Form Letter” popup screen will appear.

Press “Replace” to save as the current selected letter, or press “Save As” to save the letter with a new title.

Enter the name of the letter, then press “OK.” The letter will be stored on the hard drive.

Printing Form Letters

Press “Print Reports.” A letter for the selected customers will be printed.

<p>NOTE: Running form letters on the entire database without a filter will produce a letter for every customer in the database. If the database is large, this could take a lot of time and paper.</p>

Press “Set up Printer” to open the Print Manager and set up the printer.

Press “OK” to return “Work Management Reports” popup screen.

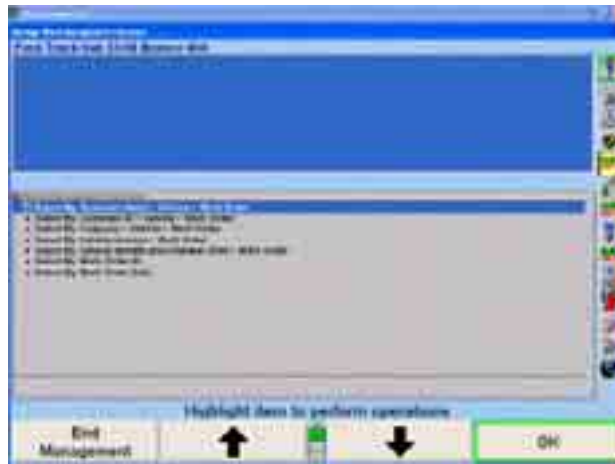
Press “End Reports” to return to the “Manage Work Management Database” popup screen.

Press “End Management” to return to the “Work Management” primary screen.

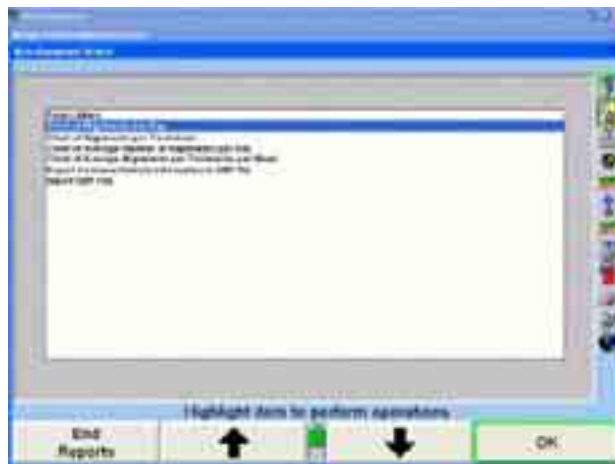
Charting Alignments



The number of alignments performed can be calculated and illustrated in a chart for a quick analysis.

Press “Manage Database” on the “Work Management” primary screen. The “Manage Work Management Database” popup screen will appear, as shown below.



Press “Make Reports.” The “Work Management Reports” popup screen will appear, as shown below.



Press  or  to highlight the desired chart. After a few seconds a popup screen with the chart will appear, as shown below.



Press “Select Chart Type” to view additional types of charts.

To print the chart, press “Print Reports.”

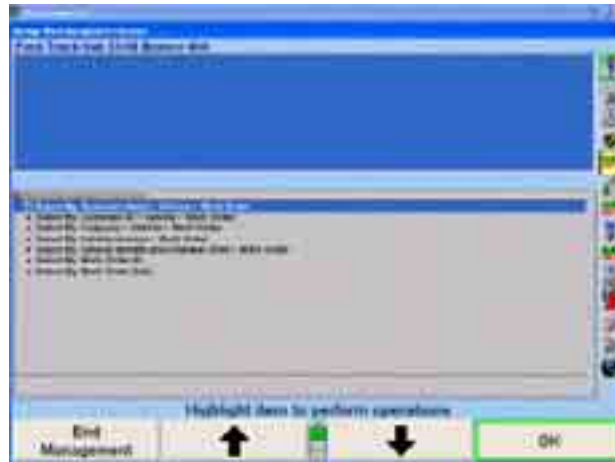
Press “OK” to return to the “Work Management Reports” popup screen.

Press “End Reports” to return to the “Manage Work Management Database” popup screen.

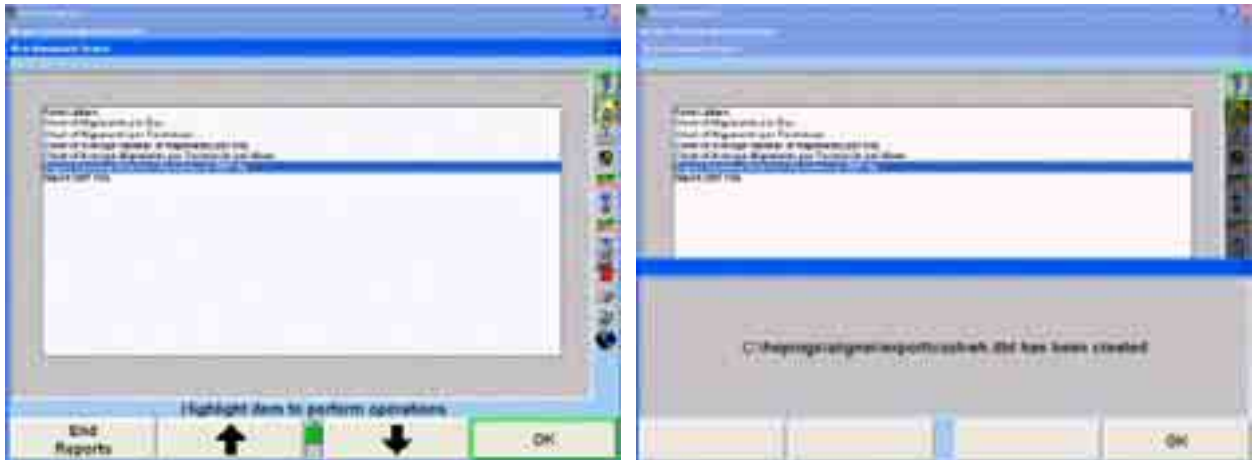
Press “End Management” to return to the “Work Management” primary screen.



Exporting Customer Database Files

Press “Manage Database” on the “Work Management” primary screen. The “Manage Work Management Database” popup screen will appear, as shown below.



Press “Make Reports.” The “Work Management Reports” popup screen will appear, as shown below.



Press  or  to highlight “Export Customer/Vehicle Information to DBF file.” A popup screen will appear stating the files are being converted. After a few seconds, a popup screen will appear stating the exported database is stored at “C:\ALIGNER\EXPORT\CUSTVEH.DBF” on the hard drive.

Press “OK” to return “Work Management Reports” popup screen.

Press “End Reports” to return to the “Manage Work Management Database” popup screen.

Press “End Management” to return to the “Work Management” primary screen.

Importing DBF Files

To import a DBF file into the Work Management database, the data fields MUST be in the exact order and length no longer than specified below.

"COMPANY"	character field	80 characters long
"LASTNAME"	character field	40 characters long
"FIRSTNAME"	character field	40 characters long
"STREET"	character field	80 characters long
"CITY"	character field	40 characters long
"STATE"	character field	40 characters long
"ZIPCODE"	character field	12 characters long
"HOMEPHONE"	character field	20 characters long
"WORKPHONE"	character field	20 characters long
"VIN"	character field	20 characters long
"LICENSE"	character field	20 characters long
"COLOR"	character field	20 characters long
"YEAR"	character field	6 characters long
"MAKE"	character field	40 characters long
"MODEL"	character field	80 characters long

The import database file should be placed at "C:\ALIGNER\IMPORT\IMPORT.DBF" on the hard drive.

If the import file is not set up correctly, the data will not be imported into the Work Management database.

5.4 Keyboard Simulator

NOTE:	The keyboard simulator is for demonstration purposes only for authorized Hunter Engineering Company Sales and Service personnel.
-------	--

NOTE:	For detailed information on using the keyboard simulator refer to <i>Form 3675T, Keyboard Simulator Operation Instructions</i> .
-------	--

Enabling and Disabling

To use the keyboard simulator, you must first "enable" it. Press "Shift," "Alt," "Ctrl" and "F8" to enable it, and press, "Shift," "Alt," "Ctrl" and "F8" to disable it.

Selecting a Sensor

To select a sensor:

press "F9"	to select the LF sensor
press "F10"	to select the RF sensor
press "F11"	to select the LR sensor
press "F12"	to select the RR sensor

Compensating a Sensor

To compensate a sensor, press "Alt" and "c." This "compensates" the sensor immediately.

Measuring Caster

Select "Shift" + "Alt" + "Ctrl" and "←" or "→" to steer the wheels left or right to measure caster.

Changing Camber of a Sensor

To change the camber of a sensor, select the sensor then press “←” to “lean” the wheel to the left, or press “→” to “lean” it to the right.

Changing Toe of a Sensor

To change the toe of a sensor, select the sensor then press “Ctrl” and “←” to “steer” the wheel to the left, or press “Ctrl” and “→” to “steer” it to the right.

Steering an Axle

To steer an axle, first select either sensor on the axle, then press “Alt”, “Ctrl” and “←” to “steer” the axle to the left, or press “Alt”, “Ctrl” and “→” to “steer” it to the right. This is useful for steering to measure caster.

Changing Caster Adjust of a Sensor

To change the caster adjust of a sensor, select the sensor then press “↑” to “lean” the steering axis forward, or press “↓” to “lean” it rearward. This is useful for adjusting caster.

To set measured caster to spec, press “Ctrl” and “Alt” and “F11.”

Changing Caster and Camber Adjustment of a Sensor with Control Arm Movement

To change the caster and camber of a sensor by adjusting a control arm, select the sensor. Then press “←” or “→” to adjust the front of the control arm, or press “↑” or “↓” to adjust the rear of the control arm.

Measuring Ride Height of a Sensor

To measure ride height of a sensor, select the sensor then press “Ctrl” and “↑” to “increase” the ride height, or press “Ctrl” and “↓” to decrease it.

Changing Battery Charge of a Sensor

To change the battery charge of a sensor, select the sensor then press “Alt” and “↑” to “increase” the charge, or press “Alt” and “↓” to decrease it.

Steering to a Preset Angle

You can steer an axle in one step to any whole angle from 0 to 9 degrees, either left or right. For example, to steer to 8 degrees right, first select the axle by selecting one of its sensors, then press “Alt” and “8”. To steer to 8 degrees left, press “Shift,” “Alt” and “8”.

This can be very useful when steering to measure caster. For example, to steer to 10 degrees left, first steer to 9 degrees left in one jump by pressing “Shift,” “Alt” and “9”, then steer further left using “←” in the usual way. Once the left measurements have been made, steer to 9 degrees right by pressing “Alt” and “9”, then steer further right using “→” in the usual way.

Miscellaneous Controls

Program status – when you press “Shift” and “Ctrl” and “F1” application version information is displayed as well as features status.

Enable/disable shortcut demo features – when you press “Shift” and “Alt” and “Ctrl” and “F9” the demo shortcut feature is enabled. Press the same combination of keys again and the feature is disabled.

Drop down menu at measurement and adjustment bar graphs – when you press the tab key from a bar graph screen, a drop down menu for the selected bar graph appears that provides additional WinAlign® features, specific for that bar graph.

Transmit measurements – when you press “Shift” and “F1” on the measurements screen, the current alignment angles will be transmitted to a file. You will be prompted to enter a name for the file.

Display language into English – when you press “Shift” and “Ctrl” and “E” the displayed language will be changed into English.

Resetting the Keyboard Simulator

To reset the keyboard simulator to these values, press “Shift” and “F8.”

To reset only the selected sensor to these values, select the sensor, and then press “Alt” and “r.”

5.5 Vehicle Inspection

Vehicle Inspection requires CD-Photo Kit 20-1196-1, to view the digital photographs. For Optimal Performance, Memory Upgrade Kit should be installed.

Point and Click Inspection Mode

“Point and Click” inspection integrates Hunter’s standard parts inspection list with digital photos and 3-D parts drawings all on the same screen. Photos are displayed on the left side of the screen and a scrollable list of inspection parts is shown on the right. If you click on a part in the photo or a part in the list and hold down the light pen or left mouse button, a menu will pop up. From this menu, you may set the status on the part, access the MAP inspection guidelines, or play MAP Inspection Videos.

Entering Vehicle Inspection

You can access “Point and Click” by selecting “Vehicle Inspection.”

NOTE:	The WinAlign program defaults to the “Part List” Inspection Mode, not the “Point and Click” Inspection Mode. “Point and Click” or “Part List” Inspection Mode can be set as the default inspection mode in “Aligner Setup.”
-------	---



The screen will display a digital photo or illustration on the left and display a scrollable inspection list on the right.

Place the pointing device in the picture area on a parts sensitive box located on any part on the corresponding list on the right. This will simultaneously display an arrow leading from the related part in the parts list.

OR

Select an item from parts list viewed on the right side of the picture. Again, “Point and Click” will display the related parts sensitive box on the screen and a related arrow pointing to the part selected.

Setting the Status in “Point and Click” or “Inspection Parts List”

Each inspection item may have one of the following three status values. These status values are equivalent in both “Point and Click” and “Inspection Parts List” modes of Vehicle Inspection Display.

Selecting one of the three inspection status values (Green, Yellow, or Red) will do all of the following:

Places an “X” in the category box when selected for final analysis.

Points to the part or assembly with a “color matched” arrow and matching colored part description when selected.

Places a check mark on the part or assembly when selected after inspection.

Will display a short definition of the part or assembly (in photo image or illustration display area) being marked off after inspection.

The three status values are:

- (Green Select Box) **“Item has been Checked”** indicates that the technician has inspected the part/assembly for damage or wear and it is in good condition.
- (Yellow Select Box) **“Suggest Replacement”** indicates that the condition of the inspected part or assembly is nearing the end of its useful life, and should be replaced.
- (Red Select Box) **“Require Replacement”** indicates that the part or assembly is worn or damaged, and should be replaced.

Refer to picture insets below.



“Point and Click”






“Inspection Parts List”

Using the or softkeys allows the technician to either move continuously through the parts list (checking every part based on the vehicle specifications) or move directly to the damaged part or assembly. Continually pressing “Set Status” up to four times in a row will ultimately clear all status references.

Parts and assemblies selected once in the inspection parts list will consistently display the same photographic image until the image can no longer support a clear view of the parts. When selecting a part that requires a different view, the photo image will change to the image or image angle for clarification. The image change is separated by a thick black line in the selection menu.

Pressing “Set Status” is another way of highlighting the part or assembly’s condition. Continually pressing “Set Status” will continually move to the next condition of that part.

The inspection category check boxes also may be appropriately filled by pressing the menu shift softkey, , and locating the matching softkeys for the above three categories of inspection.

Press  or  to scroll to the next item on the list after the status has been set.


Context Sensitive Menus for “Point and Click” or “Inspection Parts List”

“Point and Click” and “Inspection Parts List” both feature a context sensitive menu option.

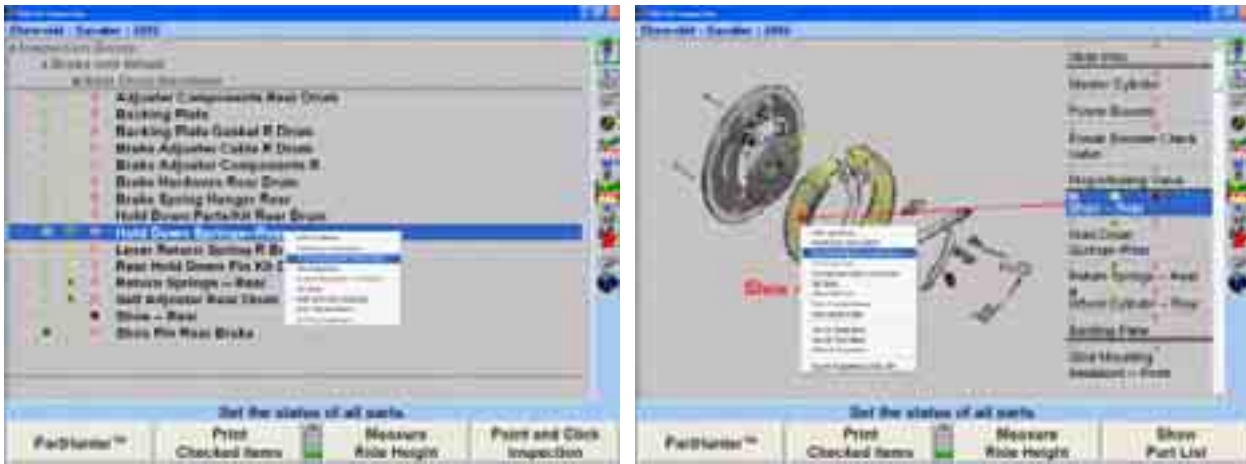
This feature can be selected from two areas of the display.

Select a part from the parts list view. Press and hold down the pointing device on a selected part for inspection.

OR

Press and hold down on the parts sensitive box  (in the photo/illustration area) or anywhere on the part or assembly. The program will automatically move the inspection parts list to that particular item.

A context sensitive menu will appear providing options for the inspection or switching between “Point and Click” and “Inspection Parts List.”



The three status options (Item has been Checked, Suggest Replacement, Require Replacement) match the selections reviewed above.

Another selection, MAP Guidelines, refers the user to the Motorist Assurance Program Uniform Inspection & Communication Standards Help File. For more information on the Motorist Assurance Program, visit Hunter’s World Wide Web Site at <http://www.hunter.com/>, or call MAP Headquarters at 202-466-7050.

MAP Inspection Videos

Requires DIGITAL-VIDEO Option for Series 411/611 Aligners.

Motorist Assurance Program (MAP) video support for vehicle inspection is also available through the "Point and Click" feature.




In the Inspection Parts Listing, an icon button representing a camcorder allows the technician to view the inspection video list. The video list in the context sensitive menu is separated from the five inspection options with a solid line.

NOTE:	Currently, not all inspection categories (based on vehicle specifications) are supported by video inspections.
--------------	--

Click and hold a movie camera icon , and a context sensitive menu will appear.



Click on the video you wish to view.

Pressing  will pause the video, and  will restart the video after it has been paused. Pressing  will return you to the Inspection Parts Listing.

After the video ends, you will be returned to the Inspection Parts Listing.

Sorting Options/Category

In the Inspection Category Listing, it is also possible to change the presentation order in the following three categories. (Shown in the previous illustration)

Sort by Illustration - the default sort method - primarily will sort the group of parts by photographic images and illustrations for the vehicle specifications selected.

Sort by Part Name - will sort the parts list into an alphabetical order against the vehicle specification selected. Each time a different part is selected from the list, the photo will change to match that selected part.

Sort by Part Type - will sort the Inspection Category List by the steering, brakes, driveline, suspension, etc. in an ascending order.

Select one of the above options by highlighting a part from the inspection category. This sorting option is located in the context sensitive menu along with the other inspection options.

Printing Inside “Point and Click”

Printing inside “Point and Click” is possible through the softkeys at the bottom of the screen. Two options are available, “Printing All Items” and “Print Checked Items.”

Pressing “Print All Items” will print the entire inspection category list for that specific vehicle specification, whether parts or assemblies were checked or not.

Pressing “Print Checked Items” will print only the parts or assemblies checked from the inspection category list.

Parts List Inspection Mode

A text only view of the inspection list is also supported. This view is very similar to the inspection list in WinAlign version 1.5 and earlier, the parts are listed by category.

You may access “Parts List” from the second tier of softkeys (Vehicle Inspection) on any primary screen, or from the shortcut menu.

NOTE: The WinAlign program defaults to the “Part List” Inspection Mode, not the “Point and Click” Inspection Mode. You can make “Point and Click” the default inspection mode in “Aligner Setup.”



Selecting the Inspection Group & Sub-Groups

You may choose from Brake and Wheel, Drivetrain, or Suspension and Steering parts categories.



The display begins with a list of inspection groups. For example, “Brake and Wheel” is considered a Group.

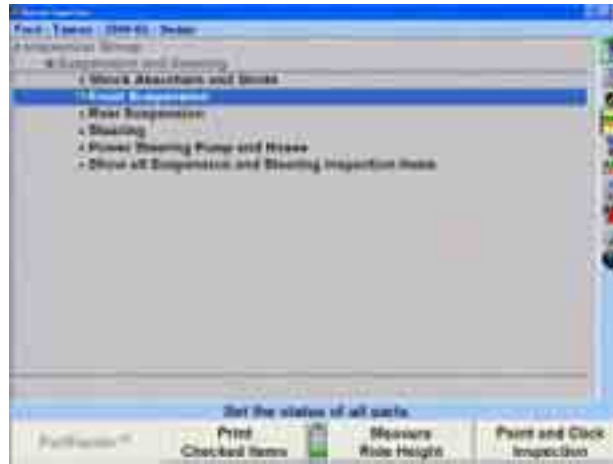
Selecting the “Brake and Wheel” Group will display an associated sub-group parts list. This list might include parts such as Front Disc Brakes, Rear Brakes, Master Cylinder and Booster, etc.

Hunter inspection lists are tailored to the vehicle selected from the specification database. The vehicle’s steering and suspension configurations are taken into consideration, and only the parts pertinent to the vehicle selected are displayed.

Press  or  until the desired group is highlighted or use a pointing device to move through the different groups and sub-groups.



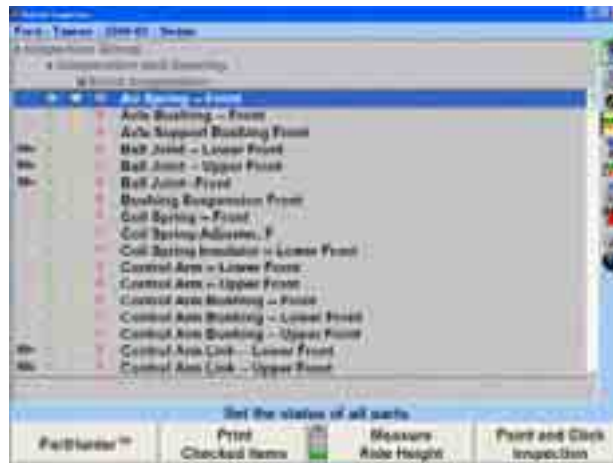
Selecting on a Sub-Group under a Group will display all related parts to be inspected. Press  or  until the desired part or assembly is highlighted.



Sub-Groups are the groups that are related under the Group selected such as “Brake and Wheel.”

Select “Front Disc Brakes” and the final Parts List will display for setting the status.

Setting the parts status is done in the final parts breakdown of the groups selected.



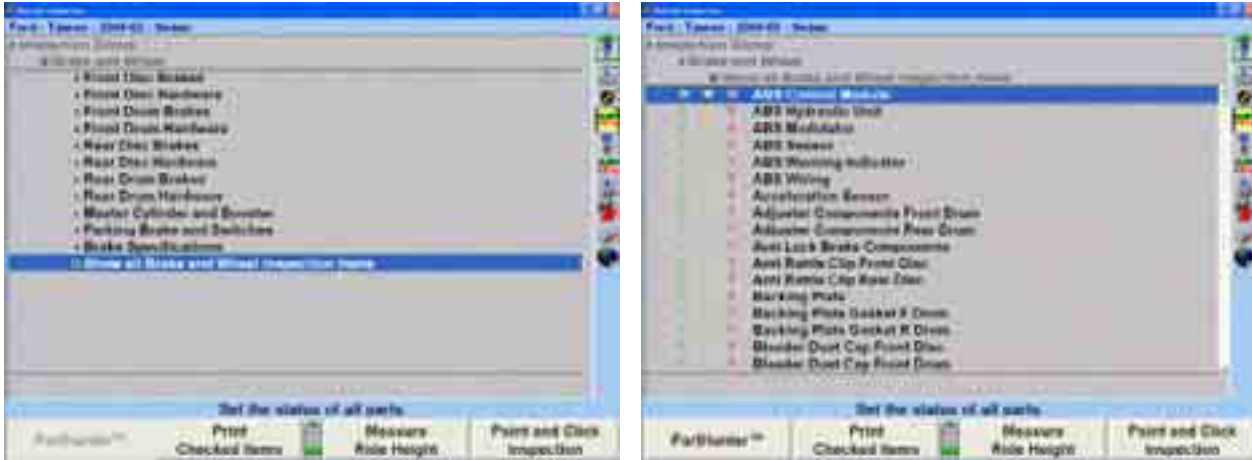
Re-selecting on group, for example, “Brake and Wheel,” will return the screen to the main group selections.

Show All Modes

“Show All Inspection Items” option is from the primary Group list. This option allows the viewing of all parts lists from all of the groups at the same time.



While a group such as “Brake and Wheel” is selected, a “Show all Brake and Wheel inspection items” option is also available. This option allows the viewing of all parts lists directly related to the Brake and Wheel Group. Re-selecting on a group, for example, “Brake and Wheel,” will return the screen to the main group categories.



Printing Selected Items and Illustrations

When all parts and/or illustrations have been selected and added to the printout, choose the “Print Checked Items” option on the Vehicle Inspection screen to print the selected parts.

Including Illustrations in Printouts

Illustrations can be included on the customer printout. To include an illustration, select a part on the Vehicle Inspection screen by highlighting it. Click and hold on the highlighted part to activate the popup screen. From the popup screen, select “Include illustration on printout.”



Selecting this option will print the illustration for the selected part. It will not print illustrations for all parts. The “Include illustration on printout” option will have to be enabled for each part that has been checked.

Adding Notes to Printouts

Notes can be added to printouts by selecting the “Set Note” option located on the Vehicle Inspection popup screen.

When “Set Note” is selected, the “Change Inspection Item Note” screen will appear.



Any notation entered on this screen for a particular part will appear on printouts. A note can be added to any part that is added to the printout. For example, if the note “The brakes are worn badly...” is entered on the “Add Notes” screen, it will then appear on a printout.

Sample Printout

Name	Joe Partburner
Address	1 Old Main St. Peters, MO 63376
Telephone	314-555-2222
Work Phone	314-222-5555
Other Phone	314-225-5552 cell
Vehicle (VIN)	
License	IR06K2
Color	red
Year	87
Technician	Roy
Mileage	69132
Time Printed	2/8/03 2:58 PM

Chevrolet : Camaro : 1987-92 : (1987-92) IR06K2

Item has been Checked
Suggest Replacement
Requires Replacement


Estimated Cost:
Parts Labor

Vehicle Inspection Parts:

Suspension and Steering

Front Suspension

Ball Joint - Lower Front \$ _____ \$ _____



Part Name	Part Number	Manufacturer	Price	Quantity
F LOWER BALL JOINT	43145	MOOG	40.26	2

Rear Suspension

Spacitor L/R Rod Bushing - Rear \$ _____ \$ _____

Part Name	Part Number	Manufacturer	Price	Quantity
R 50449 SAE L/R KIT	43173	MOOG	9.85	2

MOOG Rod Bushings
Problem Solver Link Kit #35400 Also Available
Provides Threaded Bushings For Additional Road/Trail Handling Benefits

Sub-Total:	\$ _____	\$ _____
Parts & Labor:	\$ _____	\$ _____
Tax:	\$ _____	\$ _____
TOTAL:	\$ _____	\$ _____

Toggle to the Parts List Screen

The “Parts List” screen is easily accessible from the “Point and Click” Vehicle Inspection popup screen.

Toggle to “Point and Click” Inspection

To enter the “Point and Click Vehicle Inspection” screen, select the “Point and Click Inspection” softkey.

A “Point and Click Vehicle Inspection” screen will appear.

Motorist Assurance Program (MAP) Guidelines

The Motorist Assurance Program is an industry-wide coalition dedicated to strengthening consumer satisfaction with the automotive repair industry. MAP’s participants represent the majority of the nation’s multi-bay retail automotive outlets, as well as suppliers, independent repair shops, industry associations, car companies, manufacturer’s representatives, and the trade press. MAP is developing standards of service, uniform inspection procedures, and other programs to assure consumers of the industry’s professionalism and the commitment to excellence shared by MAP’s sponsoring companies.

MAP’s achievements include production and distribution of the consumer brochure “How to Find Your Way Under the Hood and Around Your Car,” development of a Pledge of Satisfaction to Consumers and Standards of Service and establishment of relationships with regulatory agencies.

MAP is working to establish a monitoring program for the Pledge to Customers, a dispute resolution system to help resolve customer complaints within the industry, and a shop certification program to encourage policies in concert with the MAP Standards of Service and Inspection Guidelines.

MAP has united the Aftermarket behind its consumer-oriented goals and has established itself both within and outside of the industry. For more information, contact MAP at: 1444 I Street, NW, Suite 700, Washington, D.C. 20005-2210, telephone (202) 712-9042, fax (202) 216-9646.

Using MAP

To view guidelines for a highlighted part, press “MAP Guidelines,” or select “MAP Guidelines” from the context menu. A list of conditions will appear.



Select the condition that describes the symptom to view the procedures.

The MAP Guidelines are presented in a Help file. Pressing “MAP Guidelines” will initiate a Help session.

The screen will have eight buttons at the top of the Help window. To select these buttons, double click on the button with a light pen or mouse, or press the letter on the keyboard corresponding to the underlined letter of the button label.

Selecting the button labeled “Contents” will cause the Table Of Contents to appear. Pressing “Tab” to highlight a green, underlined phrase, then pressing “Enter” will change the screen to an explanation of the highlighted item.

If you are using a light pen or mouse, double click on a green, underlined phrase to see the explanation.

Selecting the button labeled “Search” will cause another screen to appear. A key word or phrase can be entered from the keyboard or selected from the list provided. Click on the “Go To” button with a light pen or mouse, or press “Enter,” and an explanation of the word or phrase will appear.

Selecting the button labeled “Back” will retrace the path taken through the Help topics.

Selecting the button labeled “History” will cause a screen to appear listing, in sequential order, every Help viewed during the current Help session.

Selecting the button labeled “Exit” will end the Help session and return the screen to the alignment in progress.

Selecting the button labeled “Print” will cause the topic in the HELP window to printout.

Selecting either of the arrow buttons will offer a series of related topics that may help to explain the currently selected topic.

Some topics in the MAP file include text that is linked to other MAP topics. These links are called jumps.

Jump text is usually green and underlined. When you point to a jump, the arrow turns into the shape of a hand.

To select a jump:

Press “Tab” to highlight the text, then press “Enter.” Press “Shift” and “Tab” to highlight previous jump text.

Or move the arrow to the jump text, and click with a mouse or light pen. The topic will appear in the MAP window.

Information provided in MAP does not always fit inside the window. When this occurs, a scroll bar is provided on the right side of the window.

To scroll through the information, do one of the following:

Click on one of the scroll arrows.

Drag the scroll box to scroll quickly.

Use the cursor arrow keys on the keyboard to scroll up or down.

Use the page up or page down keys on the keyboard.

Click above or below the scroll box in the scroll bar.

Printing the Inspection Report

To print an inspection report:

Press “Print All Items” to print a list of every item in the checklist.

Press “Print Checked Items” to print a list of only the items checked.

Cradle Inspection

Cradle to body alignment should be inspected and adjusted when necessary, before continuing with the alignment procedure

Press “Cradle Inspection” on the “Vehicle Inspection” primary screen for information about cradle positioning for those vehicles having full cradle designs. The “Cradle Illustrations” popup screen will appear with an inspection illustration and instructions.



Press “Next Illustration” or “Previous Illustration” to view additional illustrations.

Press “OK” after viewing illustrations. The screen will return to the “Vehicle Inspection” primary screen. For additional information on cradle adjustments, refer to “Cradle Adjustment,” [page 349](#).

5.6 AllData® Undercar

AllData Undercar is a fully integrated third party feature of WinAlign developed by the AllData company. This added feature accesses technical service bulletins, maintenance information, and specific undercar service information.



AllData is accessible from both the softkeys and from context-sensitive menus.



If AllData has been added to the Common Alignment Preferences in Setup, then vehicle specific technical service bulletins will automatically appear when the vehicle recall specifications have been selected. *For more information, refer to Chapter 3 “Aligner Setup.”*

5.7 Tools and Kits

Tools and Kits database is an extensive database designed to give a guided overview of hand tools and aftermarket parts and kits needed to make any particular alignment adjustment. The database is presented through images and descriptions of the actual tools and kits that are based on vehicle specifications and alignment angle.

The alignment adjustment angles are Front Toe, Front Caster, Front Camber, Rear Camber and Rear Toe. All illustrations and videos in the “Tools and Kits” database are shown only for the specific vehicle’s adjustment angle and requirements.

“Tools and Kits” has three basic features:

- Hand Tools
- Specialty Tools
- Kits

Required Hand Tools are displayed as the conventional mechanic’s tools required for completing the alignment adjustment (i.e. sockets, wrenches, drive extensions). Required hand tools are displayed with *cyan* colored frames.

Specialty Tools are displayed as tools that are not standard mechanics tools, but are specific to the make of the vehicle or to a particular kit or part being installed (i.e. 3/8 drive Torx bit for GM vehicles hub and bearing removal, or 3/8 drive bolt/nut removing tool for removal of frozen bolts). Vehicle specific special tools are displayed with *red* colored frames. Special tools needed for specific kits are displayed with *green* colored frames.

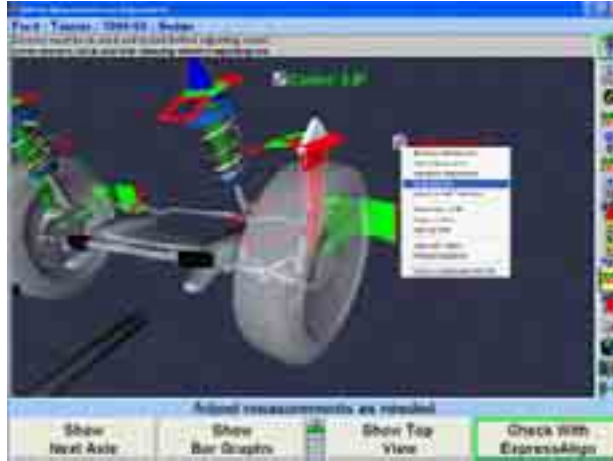
Kits are designed to correct alignment angles that cannot be corrected by simply adjusting the existing parts and assemblies on the vehicle. This may include kits such as original full contact camber/toe rear tab shim systems, Cam bolt kits, or universal system 2000 rear full contact cam/toe shims. Kits are displayed with *yellow* colored frames.

Accessing Tools and Kits

There are two basic methods of accessing “Tools and Kits.” The first method is to access the database through a drop down menu on the Virtual View screen or on a bar graph. The second is accessing “Tools and Kits” through the “Illustrate Adjustments” screen.

“Tools and Kits” may be added to the alignment procedure by ExpressAlign.

Access “Tools and Kits” through “Vehicle Measurements and Adjustments” on the Virtual View screen by pressing and holding the light pen or left mouse button down on any icon or vehicle measurement. A drop down menu will appear as shown. Press and hold the light pen or left mouse button down on any of the bar graphs. A drop down menu will appear.



Select “Tools and Kits” from the drop down menu. The “Tools and Kits” screen for the angle that it was chosen from will appear.

NOTE: The drop down menu can also be accessed using the tab key on the keyboard.

Access Tools and Kits from the ExpressAlign™ screen by selecting the “Show Tools and Kits” softkey.



Access Tools and Kits from “Illustrate Adjustments” on the Vehicle Measurements and Adjustments screen by choosing “Illustrate Adjustments” from the softkeys. The Adjustments Illustrations screen will appear.



From the Adjustments Illustrations screen, select “Tools and Kits.” The tools and kits for the angle that is being viewed will appear on the screen. In this example, the “Tools and Kits” screen for Front Camber will come into view.

Tools and Kits Screens

When “Tools and Kits” is accessed, a screen for the angle from where “Tools and Kits” was selected will appear. In this example, the tools and kits for the front camber angle are shown.



Clicking on the button will zoom in on the selected tool or kit. Selecting a tool on the “Tools and Kits” main screen and clicking on “Zoom” will also give a closer look at the tool or kit that is selected.

Some tools and kits will also display a description or more information about the tool or kit. The following is the “Zoom” for a Northstar wedge kit.



Clicking “OK” returns to the previous screen.

Changing the Angle

There are two methods of changing the angle for which “Tools and Kits” is to be viewed.

Change the Angle from the “Tools and Kits” Combo-box as follows:

Select the Front Camber in this view. Click on the Combo-box down arrow. A drop down menu will appear. The angle that you want to view can be selected from this drop down screen by clicking on it.



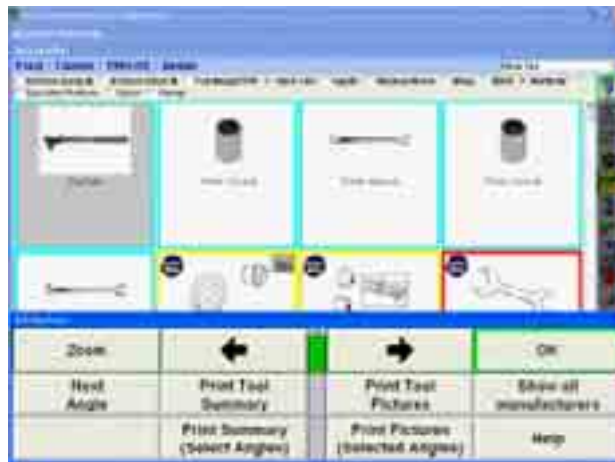
NOTE: “Out of Spec Angles” cannot be viewed unless the “Before Measurements” have been saved.

By choosing “Rear Toe,” the “Tools and Kits” menu will change to the following screen. Note that the newly selected angle now appears in the Combo-box, and that the tools and kits icons have changed to those needed for rear toe adjustment.



Change the Angle from the “Tools and Kits” Softkeys as follows:

Choosing “Next Angle” from the following “Tools and Kits” softkeys will advance to the next angle.



For example, if the Front Toe angle is being viewed, and “Next Angle” is chosen, the tools and kits screen will advance to Front Camber. Next screens appear in the order that they are in on the Combo-box drop down menu.


Using Tools and Kits Videos

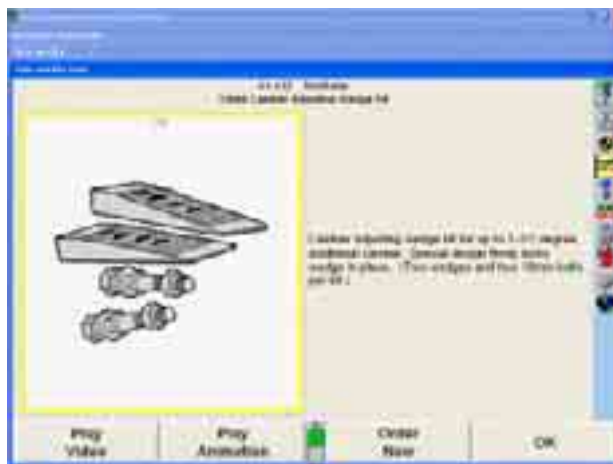
NOTE: The video electronic key must be installed, and the WinAlign Multimedia CD must be in a CD-ROM holder before the “Tools and Kits” videos can be accessed. The CD-ROM is not location sensitive and may be placed in any available CD-ROM holder in either an external or internal CD-ROM disk player.




“Tools and Kits” has several videos available for viewing installation of a particular kit, or the use of special tools.

Videos are accessible from the “Tools and Kits” main screen by clicking on the icon that appears in the upper right corner of the tool or kit that has an associated video.



Tools or kits that have videos available will display a “Video” button . This example shows the zoom view of the 41-312 Northstar 10mm Camber Adjusting Web Kit with the “Play Video” and “Play Animation” options.



When play is selected, the video will appear and begin to play. The video screen will display a horizontal tool bar that can be used move to any point, from beginning to end, in the video. The special keys on the video bar perform specific tasks that can be activated by clicking on the button. Pressing  will pause the video, and  will restart the video after it has been paused. Pressing  will return you to the Tools and Kits screen. After the video ends, the Tools and Kits screen will reappear.

Selecting Tools and Kits Manufacturers

Tools and Kits can be customized to display only the appropriate tools and parts for each shop. At the top of each page a list of manufacturers and hand tools will be available.




Select or de-select the checkboxes next to the individual manufacturers to display. Hand tools can also be selected or de-selected.

Individual vehicles and vehicle manufacturers will have different options at the top of the screen. The vehicle shown above is an early '80's Chevrolet 4x4 pickup. A 2002 Toyota Camry, shown below, only has one option for hand tools. No aftermarket kits currently exist for this vehicle.



All manufacturers can be selected at once by selecting the “Show All Manufacturers” softkey.

Ordering Tools and Kits Online

On certain specialty tools, kits, and parts an “Order Now” icon  will be available. When zooming in on a selection that has this option a “Order Now” softkey will also be available.

NOTE:	To use the “Order Now” option the aligner have an Internet connection.
	All “Order Now” transactions must be completed using a credit card only.



When selecting “Order Now” WinAlign will connect to the Internet and access a website for online ordering.

The screen will display a detailed description of the part and its application.



Upon the initial request to order parts the screen will not display any shipping information. Select "Edit Shipping Info" to create a shipping profile. Enter the country, and then fill in the Company Information order form. Select "Save Company Information" when complete. This information will be stored and saved for all future order requests.



Once the update is complete the site will return to the parts ordering page that will include the shipping information. Select "Order Now" to place the order request.



When “Order Now” has been selected the program will open the appropriate supplier parts ordering page.



Add the appropriate quantity to the cart and proceed with checkout. Each supplier's website ordering procedures may be different, but follow general online shopping methods.

Printing Reports

Several reports are available using the “Tools and Kits” softkey panel. Click the appropriate button for the report that is to be printed.



Print Tools and Kits List Reports

“Print Summary (Select Angles)” prints a list of tools and kits available for the angle that appears in the “Tools and Kits” Combo-box on the main “Tools and Kits” screen.

“Print Tool Summary” will print all of the tools and kits available for every angle for the vehicle. This will produce several pages.

“Print Summary (Select Angles)” and “Print Tool Summary” reports appear in the following format:

Name	Joe Parthunter
Address	1 Old Main
	St. Peters, MD 21376
Telephone	314 555-2222
Work Phone	314 222-5555
Other Phone	314 222-8882 cell
Vehicle (VIN)	
License	1R0CK2
Color	red
Year	87
Technician	Ray
Mileage	88756
Time Printed	2/11/93 1:47 PM

Chevrolet 87-90 Camaro 1R0CK2

Front Camber

12MM SOCKET

12MM WRENCH

14MM SOCKET

14MM WRENCH

RATCHET

Ratchet (1/2" or 3/8" Drive)

Ratchet

K325 (Moog)

16mm Magna Cam Kit

16mm Magna Cam provide up to 2-1/2 degree positive camber adj. Special tabbed washers included for GM '02, '03 & '04 model vehicles with slotted struts. Two Magna Cams per kit.

82120 (Specialty Products)

16mm Camber Kit

Cam kit provides Camber changes of up to 2-1/2 degrees positive & negative. Use part #82125 rotary files to maximize ride for proper cam adjustment. One kit covers both sides of the vehicle.

84530 (Specialty Products)

16mm Wedge Kit

Kit uses an underside bolt with the wedge to provide a positive Camber change of up to 2 degrees. One kit covers both sides of the vehicle.

41-169 (Nortstar)

16mm Magna Cam Kit

16mm Magna Cam provide up to 2-1/2 degree positive camber adj. Special tabbed washers included for GM '02, '03 & '04 model vehicles with slotted struts. Two Magna Cams per kit.

83480 (Specialty Products)

16mm EZ Cam Kit

Kit uses an underside bolt with offset to provide a positive or negative Camber change up to 1 degree positive. One kit covers both sides of the vehicle.

81280 (Specialty Products)

16mm EZ Cam Kit

EZ Cam Kit designed for non-slotted struts. Allows both positive and negative camber change up to 1.75 degrees.

85125 (Specialty Products)

Rotary File Kit

Rotary files are used for elongating holes to allow for the movement of Camber/Caster cams. Kit comes with three rotary files of 5/8, 5/8 & 1/2 diameter.

8252 (Specialty Products)

Camaro/Firebird Camber Tool

Tool for adjusting Camber on 1982-92 Camaro and Firebird

88-8922 (Nortstar)

Camber Adjusting Tool (Camaro/Firebird)

Camaro/Firebird (82 to '92) camber adjusting tool for adjusting factory provided alignment system.

Front Caster

12MM SOCKET

12MM WRENCH

14MM SOCKET

14MM WRENCH

RATCHET

Ratchet (1/2" or 3/8" Drive)

Ratchet

Front Toe

12MM SOCKET

1

Print Tools and Kits List and Pictures Reports


“Print Pictures (Select Angles)” prints the illustrations and a list of tools and kits available for the angle that appears in the “Tools and Kits” Combo-box on the main “Tools and Kits” screen.

“Print Tool Summary” will print all of the illustrations and a list of all tools and kits available for every angle for the vehicle. This will produce several pages.

“Print Pictures (Select Angles)” and “Print Tool Pictures” reports appear in the following format:

Name	Joe Padonker
Address	1 Oak Mann St. Peters, MO 65776
Telephone	514-888-3333
Work Phone	514-222-0333
Other Phone	514-222-0333 ext
Vehicle (VIN)	
License	MOCKE2
Order	new
Year	87
Technician	Ray
Message	03126
Time Printed	2/11/88 1:00 PM

Chevrolet 87-88 Camaro WOOD

Front Camber	
13MM SOCKET	
13MM WRENCH	
14MM SOCKET	
14MM WRENCH	
RATCHET	
Washer Ratchet (1/2" or 3/8" Drive)	

Front Toe	
13MM SOCKET	
TIE ROD ADJ TOOL Tie Rod Adjustment Tool	

5.8 On-The-Job-Training

Requires DIGITAL-VIDEO Option.

OJT uses on-screen animation's and video to convey simple, concise, instruction to the technician for three major alignment related categories.

WinAlign Operation

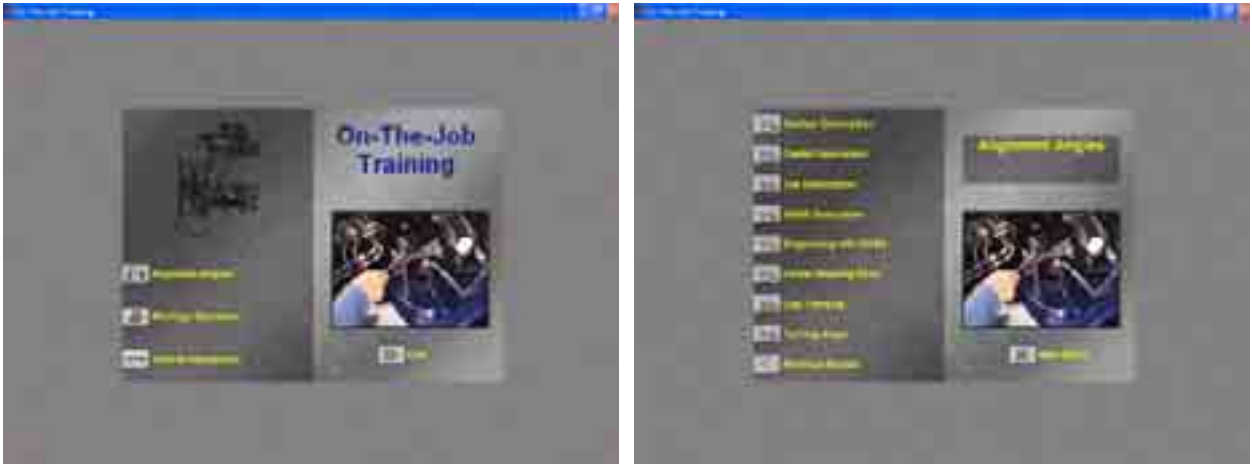
Alignment Concepts

Vehicle Adjustments

OJT is designed to be used with the *WinAlign Multimedia* CD-ROM's when no alignments are being performed.

OJT is accessed from the softkeys on the logo screen.

The primary screen of *OJT* offers the following three choices. A detailed sub menu structure is attached:



To exit *OJT*, select the “Exit” icon at the bottom right side of the display. This will automatically return you to the WinAlign program at the “Logo” screen.

At anytime in the *OJT* program you may return to the primary screen by selecting the “Main Menu” icon located at the bottom right hand side.

After passing the primary screen in *OJT* program, all secondary screens will be provided with a “Previous Screen” icon, located at the bottom of every icon selection. Selecting this icon will prompt the technician to the previous screen viewed.

Training Videos

Alignment Angles	Vehicle Adjustment (cont.)	Vehicle Adjustment (cont.)
Camber Description	Upper Control Arm-Other Slot	Trailing Arm Adjustments
Caster Description	Slot Near Ball Joint	Eccentrics
Toe Description	Eccentrics	Strut Rod
SAI Description	Ball Joint Rotation	Shims
Diagnosing with SAI/IA	Lower Control Arm	Slot
Center Steering Error	Inboard Eccentric	Aftermarket or Factory Kits
Dog Tracking	Symmetrical Eccentric	Full Contact Shims
Turning Angle	Asymmetrical Eccentric	Rear Camber
WinAlign Operation	Slot Near Ball Joint	Lower Strut
DSP Series Sensor Mounting	Slot with Special Tool	Eccentrics
Wheel Adapter Mounting on Inside of Rim	Upper Strut	Slotted Mount
Wheel Adapter Mounting on Outside of Rim	Slotted Mount with Tool	Eccentric Tab
Wheel Adapter Accessories	Strut Rotation	Create Slots
Tips on Mounting to Avoid Obstacles	Create Slots-GM	Control Arm Adjustments
Cable/Rack Wiring/Wireless	Create Slots-Ford	Lower Inboard Eccentric
DSP Series Runout Compensation	Slotted Mount	Upper Inboard Eccentric
3-point Compensation	Lower Strut	Slot
2-point Compensation	Eccentrics	Outboard Eccentric
Rolling Compensation	Slotted Mount	Upper Control Arm
DSP Series Sensor Measurements	Eccentric Tab	Slot Near Ball Joint
Measuring Toe-Out-On-Turns (TOOTS)	Create Slots	Aftermarket or Factory Kits
Measuring Maximum Steering Angle	Aftermarket or Factory Kits	Use Wedge on Lower Strut
Measuring SAI/IA	Wedge	Full Contact Shim on Beam Axle
Measuring Caster	Bolt Replacement	Replace Bolt on Lower Strut
Measuring Ride Height	Magna Cam Eccentrics	Magna Cam for Lower Strut
Equipment Inspection	Eccentric Kit	Rear Toe
Self-Centering Adaptor Inspection	Eccentric Bushing for Ford 4x4	Control Arm Adjustments
Self-Centering Adaptor Lock Latch Adjustment	Cradle Adjustment (Audi)	Inboard Eccentric
DSP400 Target Inspection/Cleaning	Front Caster	Tie Rod
Power Jack Inspection	Upper Control Arm-Shims	Slot
Turnplate/Slip Plate Inspection	Symmetrical Outboard Shims	Upper Inboard Eccentric
Vehicle Adjustment Procedures	Asymmetrical Outboard Shims	Trailing Arm Adjustments
Adjusting with Axle Jacked Up	Symmetrical Inboard Shims	Eccentric
Front Toe	Asymmetrical Inboard Shims	Strut Rod
Conventional Steering	Upper Control Arm-Other Slot	Shims
High Rack and Pinion	Slot	Full Contact Shims
Low Rack and Pinion	Eccentrics	Rear Camber
Relay Rod	Lower Control Arm	Lower Strut
Raised Toe (Audi)	Symmetrical Eccentric	Eccentrics
Raised Toe Special Tools (Audi)	Strut Rod	Slotted Mount
Front Camber	Slot with Special Tool	Eccentric Tab
Upper Control Arm-Shims	Upper Strut	Create Slots
Symmetrical Outboard Shims	Slotted Mount with Tool	Control Arm Adjustments
Asymmetrical Outboard Shims	Strut Rotation	Lower Inboard Eccentric
Symmetrical Inboard Shims	Create Slots-GM	Upper Inboard Eccentric
Asymmetrical Inboard Shims	Create Slots-Ford	Slot
	Slotted Mount	Outboard Eccentric
	Rear Toe	Upper Control Arm
	Control Arm Adjustments	Slot Near Ball Joint
	Inboard Eccentric	Aftermarket or Factory Kits
	Tie Rod	Use Wedge on Lower Strut
	Slot	Full Contact Shim on Beam Axle
	Upper Inboard Eccentric	Replace Bolt on Lower Strut
		Magna Cam for Lower Strut

5.9 i•SHOP Standards

i•SHOP Overview

An i•SHOP-compliant shop is able to share vehicle information with every workstation in the garage, whether it is an accounting system, the shop management computer, a diagnostic system, or an alignment system.



Not only do i•SHOP-compliant products share pertinent information throughout a shop, but also an efficient process is at work that saves time and eliminates errors. When i•SHOP Standards are in place, relevant data is presented when and where it is needed. This is accomplished by the “seamless” sharing of vehicle information from any point in the shop, to any other i•SHOP -compliant shop or member. Information need only be entered into the network one time and is immediately and automatically available to others.

For more information about the i•SHOP Standards, visit the i•SHOP web site at <http://www.ishopstandards.org/>, contact any i•SHOP member, or contact:

i•SHOP Standards
Automotive Aftermarket Industry Association
4600 East-West Highway, Suite 300
Bethesda, MD 20814
Tel (301) 654-6664 Fax (301) 654-3299

What are the i•SHOP Standards

i•SHOP Standards are a set of hardware, database, and communications standards that can be built into automotive service facilities’ computer-based products and services. From the point-of-sale station where orders are produced, to the computer systems in the bay, to the bookkeeper in the back office, vehicle information is instantly available.

i•SHOP Standards make it possible for every computer-driven piece of equipment in a shop to seamlessly share information. There is nothing to buy and i•SHOP does not add to the cost of the products. It is a set of “standards” that prepares each i•SHOP-compatible product to exchange information and deliver valuable new information when connected to other i•SHOP-compatible products or services.

Where is i•SHOP found

The i•SHOP Standards are a set of standards that are available within the United States and Canada. Long-range goals are to create standards that can link automotive service providers worldwide.

i•SHOP Scenario

When i•SHOP is enabled, the front shop computer is running i•SHOP compliant shop management software. At the same time, the back shop computer is running i•SHOP compliant diagnostic/repair equipment. Meanwhile, a third computer running i•SHOP compliant ALLDATA is providing an automotive information database.

Front Shop

Start Shop Management System on an i-SHOP compliant computer running in the front shop.

Create a new work order. The Shop Management System will create a work order in its own database. No communication with other shop equipment occurs during the creation of a work order.

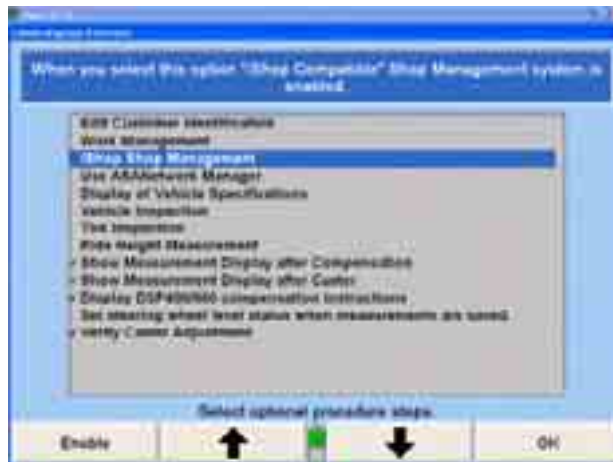
Identify the vehicle using AAIA (Automotive Aftermarket Industry Association). The Shop Management System will identify the vehicle using the AAIA database. For additional information on AAIA, visit the AAIA web site at <http://www.aftermarket.org/>.

Identify Tasks and Photo within the shop management system. Associate a photo with the work order.

Create the tasks in the work order.

Back Shop

i-SHOP must be enabled in the Common Alignment Preferences in WinAlign Setup.



Back Shop Connection (process moves to the back shop). WinAlign 6.0 and WinSI 3.x vehicle inspection software are both i-SHOP compliant “back shop” applications.

The back shop software automatically establishes a connection to the front shop.

When you press “Begin Alignment,” WinAlign will query for open work orders.



List Work Orders lists all open work orders.

Select a work order and press “OK.”

Customer Search (Optional). It is possible to search for a particular customer name.

List Tasks. After selecting a work order, the list of tasks will be displayed.

Select “Four Wheel Alignment” if you are doing an alignment.

Front Shop

Begin Task / Notify Front Shop (Process taking place in the front shop).

At this point, the front shop system will be notified that a task has started.

The shop management system can display a message indicating that the task has started on the back shop equipment.

Back Shop

Recall Shop Information (Process taking place in the back shop, within WinAlign).



If ALLDATA Undercar Diagnostic and Repair Information Database is running on a separate computer, running i•SHOP compliant information system it can be displayed in WinAlign.

The system will now query ALLDATA for any relevant information.



The user can browse through the ALLDATA database displayed in HTML using a “Web browser” interface within WinAlign.

Press “OK” to continue.

Complete the alignment at the back shop.

When on the ExpressAlign screen, the procedure can be saved into a note that will later be visible at the front shop.

Store the results of the alignment procedure. The results will be transferred to the front shop.

Save the Current Work Order to the Shop Management System. The order will be transferred to the front shop.



Front Shop

Shop Management Recall (Process moves to the front shop). At the front shop, it is possible to view notes produced at the back shop.

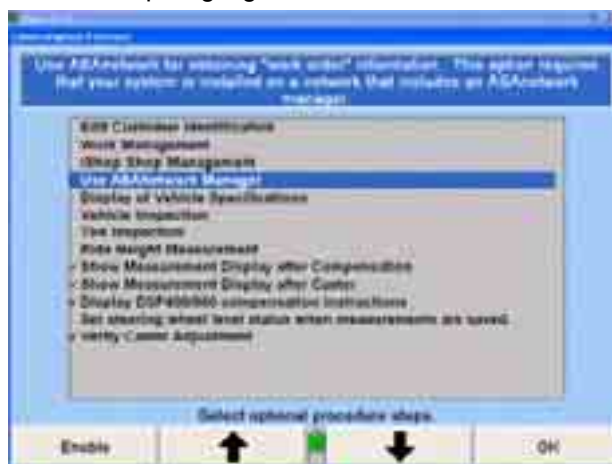
Recall Result Object.



At the front shop, it is possible to view the results of the alignment.

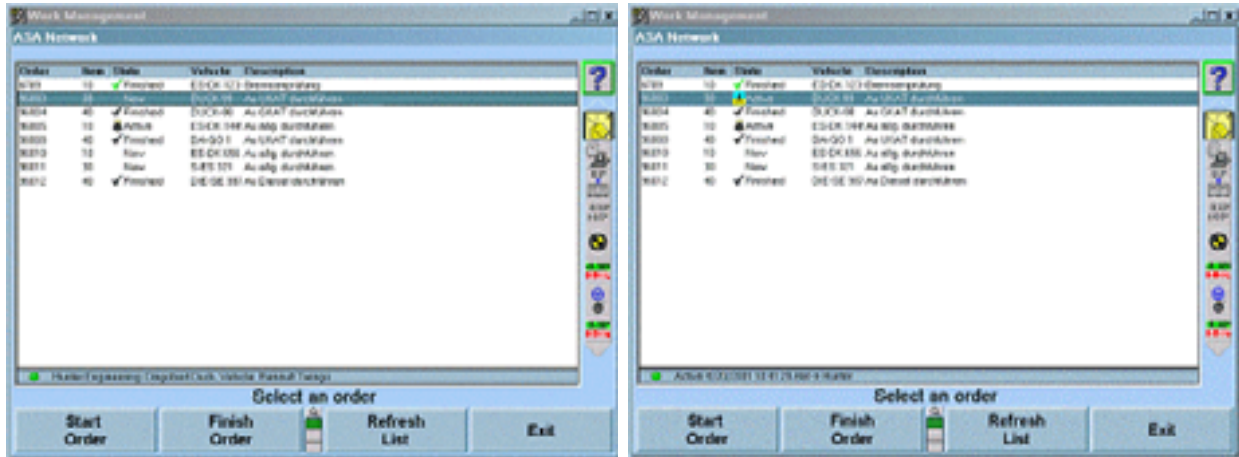
5.10 ASANetwork Manager

The ASA Network is a work order management system much like i•SHOP, is primarily targeted towards specific accounts requiring ASANetwork compatibility. The ASANetwork streamlines the work order process and manages all aspects of the work order from order writing, to performing the services, to completing the sale, to cataloging the customer's history. The ASANetwork Manager must be enabled in the Common Alignment Preferences section of Set up. Highlight the selection and select "OK" to enable.

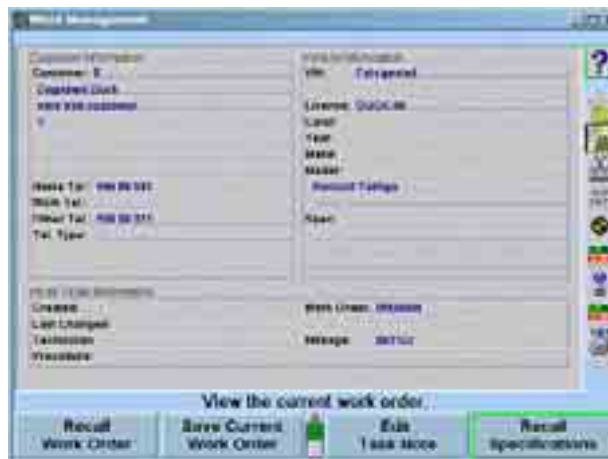


A new work order is created using the shop management system.

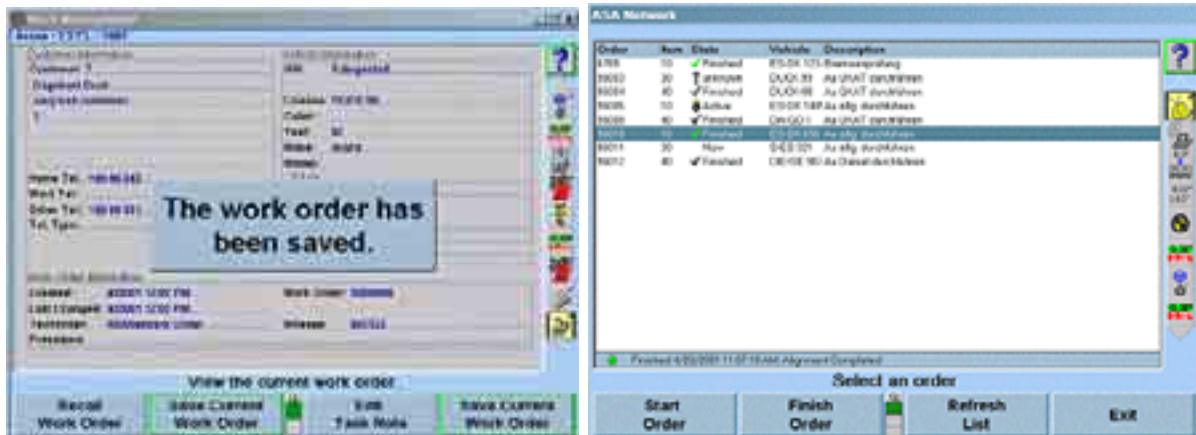
The technician prepares for an alignment by selecting the appropriate work order displayed in the ASANetwork screen within Work Management in WinAlign, as shown on the left. Notice all work orders for the day are shown with their status displayed in the “State” column. When work order is in progress the state will display “Active” and an icon will be displayed next to it to show whether it is locked or open, as shown on the right.



The work order information is automatically entered into the correct fields within the Work Management screen.



Proceed with the alignment. When the work is complete, the work order will be saved and the data will be transferred to the ASANetwork Manager. The ASANetwork Manager will also show that the status has changed to “Finished.”



When the work order is completed, the results of the alignment are transmitted to the network manager.

The results can be viewed and printed from the shop management software, as illustrated below.



5.11 VideoTech

VideoTech Overview

VideoTech requires the Digital-VIDEO option. VideoTech requires either the Multimedia CD set or the Multimedia DVD.

“VideoTech” is designed to help the technician diagnose specific vehicle problems in alignment, tires, and brakes. “VideoTech” uses video and animation segments that can be viewed prior to vehicle service, or during the alignment procedure.

VideoTech is divided into five categories:

- Tire Wear
- Vibration and Noise
- Adjustment Concepts
- Advanced Alignment Concepts
- Handling Conditions

Accessing VideoTech

To access VideoTech, from the logo screen expand the softkeys to display the “VideoTech” softkey. The “VideoTech” softkey is also available under the “Service Programs” tier of softkeys.

“VideoTech” is also accessed within the alignment procedure. Place the cursor over an alignment bar graph, click and hold, and a drop down menu will display with the “VideoTech” option available, as shown in the close-up below.



Playing a VideoTech Video

Install the “VideoTech” CD or the Multimedia DVD into the CD/DVD player on the aligner.

Select “VideoTech.” This will bring up a menu list for all videos available, as shown below.






Scroll through the list and select the appropriate subject by highlighting it. When highlighted, a window will display at the top of the screen with a brief description and screen shots from the video chosen.

Press the “Play Selection” softkey when the appropriate selection is highlighted.


Video Controls

There are two types of controls on the VideoTech screen: audio and video. When the video displays, the bottom of the screen will contain the video controls. The bar that runs from left to right shows the progression of the running film clip.

The bar is also used to fast forward or rewind the selection, stopping it at any given point. At the end of the bar is a “Stop” button, , a “Pause” button, , and a “Play” button, . The clip can be paused and re-started as necessary.



Once the “Stop” button is pressed, the video stops playing and the display returns to the VideoTech video menu.

The right side of the screen will contain the volume-adjust control bar, . By sliding the bar up or down the volume can be adjusted accordingly, without adjusting the volume on the aligner cabinet. If the sound is fully adjusted and the volume is still too low, then the aligner cabinet volume will have to be increased.

VideoTech Instructional Videos

All of the following diagnostic tests should begin with an appropriate vehicle inspection.

Tire Wear

Center Tread Wear

Cupping Wear

Inside Shoulder Wear

Outside Shoulder Wear

Inside and Outside Shoulder Wear

Tread Lug Wear

Fixing Tread Wear

Vibration And Noise

Disc Brake Noise

Drum Brake Noise

Wheel and Tire Vibration

Steering Wheel Shimmy

Adjustment Concepts

Four Wheel Alignment

Adjustment With Wheels Raised

Thrust Line Alignment

Center Steering Effort

Dog Tracking

Advanced Alignment Concepts

Insufficient Adjustment

Gross Alignment Errors

Matching Measurements Side to Side

Alignment Bushing Calculator

Frame Angle

Turning Angle

Handling Conditions

Camber Pull

Caster Pull

Tire Pull

Excessive Torque Steer

Toe Pull

Brake Pedal Pull

Continual Brake Pull

Power Steering Pull

Memory Steer for a Rack and Pinion Steering System

Memory Steer for a Conventional Steering System

Bump Steer

Wander

Excessive Steering Effort

Both of the new formats begin with the following “header” information:

1. date
2. time
3. vehicle identification number (VIN)
4. mileage
5. customer last name
6. customer first name
7. technician name
8. work order number
9. Spec name (the vehicle name as it appears after recall specs in WinAlign)
10. The procedure ID
11. The index to the current step in the procedure
12. Left Front Sensor Status
13. Right Front Sensor Status
14. Left Rear Sensor Status
15. Right Rear Sensor Status
- The status indicator is 0 if everything is OK and 1 if there is any problem.
16. Left Front Status Mask
17. Right Front Status Mask
18. Left Rear Status Mask
19. Right Rear Status Mask

The status mask provides detailed information about the status of each sensor. Further details on the contents of the status mask are available upon request.

Following the “header” information are all of the data for the front and rear axle. Each axle is preceded by an axle identifier of either “Axle 0” or “Axle 1.” For each angle, the value of the angle is displayed. If the format with status is used, then a number representing the status follows each angle value. This status number can have one of the following values:

- | | |
|----|--|
| -2 | The value of the angle is not valid |
| -1 | The angle is valid but the spec is not |
| 0 | The angle is not within spec |
| 1 | The angle is within spec |

Values that are not valid are presented as -99.

The same set of angles is shown for each axle. The order of the angle values is as follows:

* Custom Account Measurement

1. camber, left
2. camber, right
3. camber, cross
4. caster, left
5. caster, right
6. caster, cross
7. caster adjust, left
8. caster adjust, right
9. caster adjust, cross
10. caster, steer angle
11. included angle, left
12. included angle, right
13. included angle, cross
14. SAI, left
15. SAI, right
16. SAI, cross
17. steer, thrust, or scrub angle
18. steer, thrust, or scrub angle, center line referenced
19. set back, angle, live
20. set back, angle, snapshot
21. set back, distance, snapshot
22. toe, left
23. toe, right
24. toe, total
25. toe, raised procedure, left
26. toe, raised procedure, right

27. toe, raised procedure, total
28. toe, raised procedure, cross (side-to-side)
29. toe, adjust, left
30. toe, adjust, right
31. toe, adjust, total
32. bump steer delta, raised, left
33. reserved for future enhancements
34. reserved for future enhancements
35. reserved for future enhancements
36. reserved for future enhancements
37. bump steer delta, lowered, total
38. lock to lock steer, left wheel, left steer (LILOCK)
39. lock to lock steer, left wheel, right steer (ROLOCK)
40. lock to lock steer, right wheel, left steer (LOLOCK)
41. lock to lock steer, right wheel, right steer (RILOCK)
42. toe out on turns, reference wheel spec, left steer
43. toe out on turns, measured wheel difference, left steer
44. toe out on turns, measured wheel difference, right steer
45. ride height, left
46. ride height, right
47. ride height, cross
48. reserved for future enhancements
49. reserved for future enhancements
50. wheelbase difference angle, live
51. wheelbase difference angle, snapshot
52. wheelbase difference distance, snapshot
53. track width difference angle, live
54. track width difference angle, snapshot
55. track width difference distance, snapshot
56. lateral offset difference angle, left, live
57. lateral offset difference angle, left, snapshot
58. lateral offset difference distance, left, snapshot
59. lateral offset difference angle, right, live
60. lateral offset difference angle, right, snapshot
61. lateral offset difference distance, right, snapshot
62. axle offset angle (thrust angle), snapshot
63. axle offset distance (thrust angle), snapshot
64. steering wheel angle
65. Rear toe variation 128 mm right
66. Rear toe variation 128 mm left
67. Rear toe variation 78 mm right
68. Rear toe variation 78 mm left
69. Trim height, cross
70. toe, cross (side-to-side)
71. toe out on turns, cross (side-to-side)
72. camber at 0° toe, left (snapshot)
73. camber at 0° toe, right (snapshot)
74. camber at 0° toe, total (snapshot)
75. camber at 0° toe, cross (snapshot)
76. toe pressed, *, left
77. toe pressed, *, right
78. toe pressed, *, total
79. toe pressed, *, cross (side-to-side)
80. Trim height left *
81. Trim height right *
82. Wheelbase left direct measurement
83. Wheelbase right direct measurement
84. track width front direct measurement
85. track width rear direct measurement
86. Tire pressure, left
87. Tire pressure, right
88. Tire tread depth, outside, left
89. Tire tread depth, center (or only measurement if only one tread depth is used), left
90. Tire tread depth, inside, left
91. Tire tread depth, outside, right
92. Tire tread depth, center (or only measurement if only one tread depth is used), right
93. Tire tread depth, inside, right
94. Ball point, left
95. Ball point, right
96. Control point (linear distance)
97. toe, *, zero spec, left
98. toe, *, zero spec, right
99. toe, *, zero spec, total
100. steering wheel angle, non-caster steer, live
101. caster adjust, left, live
102. caster adjust, right, live

- 103. caster adjust, cross, live
- 104. caster adjust, left, frozen
- 105. caster adjust, right, frozen
- 106. caster adjust, cross, frozen
- 107. camber, left, live
- 108. camber, right, live
- 109. camber, cross, live
- 110. camber, left, frozen
- 111. camber, right, frozen
- 112. camber, cross, frozen
- 113. height, left (angular measurement)
- 114. height, right (angular measurement)
- 115. height, cross (angular measurement)
- 116. body width offset, left, distance, as measured
- 117. body width offset, left, distance, corrected with uncompensated camber and ride height
- 118. body width offset, right, distance, as measured
- 119. body width offset, right, distance, corrected with uncompensated camber and ride height
- 120. ride height, left, distance, as measured
- 121. ride height, right, distance, as measured
- 122. body wheel offset, left, distance
- 123. body wheel offset, right, distance
- 124. body wheel set back parallel to body centerline, distance, positive if left wheel
- 125. track width (distance between wheel centers), distance
- 126. wheelbase (distance between wheel centers), left, distance (vehicle-, not axle-related; stored only in front axle)
- 127. wheelbase (distance between wheel centers), right, distance (vehicle-, not axle-related; stored only in front axle)
- 128. body angle, angle, positive if body centerline is rotated clockwise from geometric centerline when viewed from above (vehicle-, not axle-related; stored only in front axle)
- 129. roll angle, angle, positive counterclockwise when viewed from behind, with 0 = level (calculated individually for each axle)
- 130. pseudo-track-width computed from the outside centers of the wheels, distance
- 131. caster offset from zero measured at the end of the caster steer, with level sensors, left
- 132. caster offset from zero measured at the end of the caster steer, with level sensors, right
- 133. Control point (angular measurement)
- 134. Steering Lash
- 135. Suspension play
- 136. scrub angle, angle of this axle to the scrub reference axle of this axle's "axle position"; meaningful only for non-steerable axles within an axle position having more than one non-steerable axle, except that it is not meaningful for the scrub reference axle of the axle position; positive to the right
- 137. wheelbase averaged from left and right direct measurements, distance
- 138. wheelbase averaged from Body Shop left and right wheelbases, for determining proper Ackerman arm, distance

Additional measurements may be added in future releases of WinAlign.

Transmitting Measurements in the C111 Format- Partial Measurements C111 Format A

Character#	Length	Format	Data
0-11	12	"HUNTER AUDIT"	preamble
12-17	6	"-NN.NN"	left front camber
18-23	6	"-NN.NN"	right front camber
24-29	6	"-NN.NN"	left front caster
30-35	6	"-NN.NN"	right front caster
36-41	6	"-NN.NN"	left front toe
42-47	6	"-NN.NN"	right front toe
48-53	6	"-NN.NN"	total front toe
54-59	6	"-NN.NN"	front setback

60-65	6	"-NN.NN"	left front SAI
66-71	6	"-NN.NN"	right front SAI
72-77	6	"-NN.NN"	left front included angle
78-83	6	"-NN.NN"	right front included angle
84-89	6	"-NN.NN"	left rear camber
90-95	6	"-NN.NN"	right rear camber
96-101	6	"-NN.NN"	left rear toe
102-107	6	"-NN.NN"	right rear toe
108-113	6	"-NN.NN"	total rear toe
114-119	6	"-NN.NN"	rear thrust angle
120-121	2	"HH"	compensation/caster/SAI status
122	1	"H"	alignment procedure number
123	1	"H"	alignment step number (invalid)
124-141	18	"HH:MM:SS DD-MM-YY"	time and date
142-156	15	"NNNNNNNNNNNNNNNN"	16 blank chars (spaces)
157	1	"0"	message identification
158-159	2	0DH,0AH	carriage ret, line feed

Total 160 characters.

Alignment procedure number:

4 = Total 4 wheel alignment

2 = Thrust line alignment

0 = Center line alignment

Compensation/caster/SAI status:

Bit # Use

0	1 = left front sensor compensated
1	1 = right front sensor compensated
2	1 = left rear sensor compensated
3	1 = right rear sensor compensated
4	1 = caster measured
5	1 = SAI and Included Angle measured
6	1 = not used
7	1 = not used

Transmitting Measurements in the C111 Format- Partial Measurements C111 Format B

<u>Character #</u>	<u>Length</u>	<u>Format</u>	<u>Data</u>
0-5	6	"-NN.NN"	left front camber
6-11	6	"-NN.NN"	right front camber
12-17	6	"-NN.NN"	left front caster
18-23	6	"-NN.NN"	right front caster
24-29	6	"-NN.NN"	left front toe
30-35	6	"-NN.NN"	right front toe
36-41	6	"-NN.NN"	total front toe
42-47	6	"-NN.NN"	front setback
48-53	6	"-NN.NN"	left front SAI
54-59	6	"-NN.NN"	right front SAI
60-65	6	"-NN.NN"	left front included angle
66-71	6	"-NN.NN"	right front included angle
72-77	6	"-NN.NN"	left rear camber
78-83	6	"-NN.NN"	right rear camber
84-89	6	"-NN.NN"	left rear toe
90-95	6	"-NN.NN"	right rear toe
96-101	6	"-NN.NN"	total rear toe
102-107	6	"-NN.NN"	rear thrust angle
108-109	2	"HH"	compensation/caster/SAI status
110	1	"4"	always "4"
111	1	"0"	always "0"
112-129	18	"HH:MM:SS DD-MM-YY"	time and date
130-135	6	"NNNNNN"	6 blank characters (spaces)
136	1	"0"	message identification
137-138	2	0DH,0AH	carriage ret, line feed

Total 139 characters.

Compensation/caster/SAI status:


Bit #	Use
0	1 = left front sensor compensated
1	1 = right front sensor compensated
2	1 = left rear sensor compensated
3	1 = right rear sensor compensated
4	1 = caster measured
5	1 = SAI and Included Angle measured
6	1 = not used
7	1 = not used

6. Equipment Information


6.1 Conventional Sensors

Care and Cleaning of the Conventional Sensors

When cleaning the sensors, use a mild window cleaning solution to wipe off the sensors and adaptors.

 **CAUTION:** Do not hose down or submerge the sensors. Do not spray cleaner on sensor. This could cause damage to the electrical system and optical components.

Keep wheel adaptor rods cleaned and lubricated. Lubricate as needed with a coating of light lubricant such as WD-40.

 **CAUTION:** Do not lubricate center screw shaft.

RF*STIK

The DSP200-RF, DSP208-RF, DSP250-RF, DSP258-RF sensors communicate with the aligner console using Radio Frequency (RF). Radio waves are transmitted and received from the sensors and the RF*STIK (located on top of the aligner console).

In rare instances, the RF*STIK may receive interference from electronic devices in the neighborhood (pagers, mobile phones, etc.). The DSP200-RF, DSP208-RF, DSP250-RF, DSP258-RF sensors and RF*STIK may be configured to use different radio frequencies to minimize interference.

Interference may occur because the radio waves of an individual sensor are not being well received by the RF*STIK. When this happens, move the mobile cabinet at least 2 or 3 inches (51 or 76 mm) in any direction.

Temporary interference problems can be solved by connecting the sensors to the aligner console through the sensor cables instead of by radio.

HF Pod

The DSP250-HF, DSP258-HF, DSP306-HF, and DSP308-HF sensors communicate with the aligner console using high frequency. Radio waves are transmitted and received from the sensors and the HF Pod that is located on top of the aligner console.

In rare instances, the HF Pod may receive interference from electronic devices in the neighborhood (primarily microwave ovens). The HF system can be easily configured to use different frequencies to minimize interference. However, microwave ovens create considerable energy over a broad band. The best way to avoid interference from microwave ovens is to turn them off during an alignment. In instances when the microwave use cannot be controlled, distance is the best remedy for microwave interference. The aligner should be placed a minimum of 30 feet from the microwave oven to minimize interference.

Temporary loss of signal may occur because the radio waves of an individual sensor are not being well received by the HF Pod. When this happens, move the mobile cabinet at least 2 or 3 inches (51 to 76 mm) in any direction.

Temporary interference problems can be solved by connecting the sensors to the aligner console through the sensor cables instead of by radio.

The four LED stick-type displays on the HF Pod indicate the integrity of communication between the aligner console and the four sensors.

Refer to "Aligner Set Up" for details on "Setting Up HF Channels."

XF Pod (DSP506XF and DSP508XF Sensors Only)

The DSP506XF and DSP508XF sensors communicate with the aligner console using Extra High Frequency (XF). Radio waves are transmitted and received from the sensors and the XF Pod.

Occasionally the XF Pod may receive interference from electronic devices in the neighborhood (microwaves). The DSP506XF and DSP508XF sensors and XF Pod may be configured to use different radio frequencies to minimize interference.

The XF system transceiver generates power radio waves in the range of 2.4 GHz. Radio waves at these frequencies reflect off most objects, resulting in an indoor and outdoor range of approximately 100 feet (30 meters).

Interference has occurred when the XF Pod does not receive the radio waves. If this happens, move the mobile cabinet approximately 2 or 3 inches (51 or 76 mm) in any direction.

Temporary interference problems can be bypassed by connecting the sensors to the aligner console with the sensor cables.

XF2 Pod (DSP506XF and DSP508XF)

The DSP506XF and DSP508XF sensors communicate with the aligner console using Extra High Frequency (XF). Radio waves are transmitted and received from the sensors and the XF2 Pod.

Occasionally the XF2 Pod may receive interference from electronic devices in the neighborhood (microwaves). The DSP506XF and DSP508XF sensors and XF2 Pod may be configured to use different radio frequencies to minimize interference.

The XF system transceiver generates power radio waves in the range of 2.4 GHz. Radio waves at these frequencies reflect off most objects, resulting in an indoor and outdoor range of approximately 100 feet (30 meters).

Interference has occurred when the XF2 Pod does not receive the radio waves. If this happens, move the mobile cabinet approximately 2 or 3 inches (51 or 76 mm) in any direction.

Temporary interference problems can be bypassed by connecting the sensors to the aligner console with the sensor cables.

Precautions for Systems Equipped with XF Cordless Sensors

The following precautions apply to the XF transceivers installed in the aligner console and the alignment sensors as part of the XF cordless sensor option.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interferences that may cause undesired operation of the device.



WARNING: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



WARNING: Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Charging Conventional Sensor Batteries (RF and HF/HFSS Sensors Only)

Each sensor contains a 6VDC, sealed lead acid, rechargeable battery. To get the maximum life out of the batteries in the sensors, follow these three rules:

If the sensors are not in use, charge them.

Switch sensors "OFF" during charging, if you are using cables.

Charge for fourteen hours minimum, and/or provide an extended charge time (24 hours or longer) at least once a week.

NOTE:

Make sure the main power switch at the rear of the console is left "on" and the outlet that supplies power to the aligner is on. "K" and "P" cabinets are equipped with a computer, printer and CRT, but still provide power to the charging stations when using the standby power switch. This standby power switch is located on the front or side of the cabinet.

The "S" cabinet does not have a standby power switch. The computer, printer, and CRT may be switched "off" independently from the main power switch.

To prevent premature degradation of battery performance, the charger has to replace 125% of the energy that was removed from the battery. It is not necessary to fully discharge the batteries before charging. However, ***it is important they be charged fully.***

Charging Information

To recharge the batteries when the sensors are not in use, place the wheel adaptors (with the sensors still mounted) on the cabinet storage hanger and leave the main aligner power ON. The contacts on the back of the sensors will match the contacts on the front of the storage hangers.

Any time batteries are being charged, the Red/Green charge indicator light on the sensor will be illuminated.

You should expect at least 8 hours of continuous use from a fully charged battery.

If you are not getting this amount of usage time, the most likely cause is inadequate charging time.

Batteries that are consistently subjected to partial charging rather than full charge cycles will permanently lose capacity.

Charging time for a fully discharged battery with the sensor power switch turned "OFF," is 12 to 14 hours. Three or four times this interval would be required if the sensors were left "ON" during the charge cycle. It is very important that the sensors be turned "OFF" during charging. The sensor's power switch is located on the sensor next to the charge indicator LED.

Charging overnight with the sensors' power switches set to "OFF" will provide a proper charge.

Our charging system cannot over-charge the batteries. If you're not using the sensors, charge them!

The sensor batteries are rated for 200 full charge/discharge cycles, making their life expectancy about one year for the customer that consistently discharges them 100%. Life expectancy for batteries with lower usage can be significantly longer.

100% Discharge	200 Cycles
50% Discharge	450 Cycles
30% Discharge	1200 Cycles

In a shop with extended service hours, there are some things you can do to prolong battery life:

When the sensors are not being used to perform alignments, they should be stored on the charging hangers with sensor power switched off. At a minimum, turn the sensor "OFF" between alignments. Any charging accomplished throughout the day can shorten the necessary overnight charge time.

If you have one day out of the week when alignments are not performed, you can let the sensors charge continuously for 24 hours or longer. This should "undo" the effects of any undercharging that occurred during the previous week. This sort of prolonged charging will only be effective at "repairing" the batteries if performed regularly. Once a week is the recommended minimum.

When is it time to replace the batteries?

If after a full charge the battery does not last for the expected 8 hours, you should put it through one or two sessions of extended charge time (24 hours or longer). If the battery does not recover and start giving satisfactory cycle time, then it should be replaced. The sooner you catch the batteries discharging prematurely, the more likely an extended charge time will restore the battery to normal capacity. If the battery discharge time is only three or four hours, it is unlikely that extended charge time will help significantly.

Additional Information:

The charge light indicator turning from yellow to green is an indication that the charging mode has switched from a fast charge mode into a “trickle” charge mode. It does not mean that the battery is 100% charged. A fully discharged battery should be allowed to “trickle” charge a minimum of five hours to ensure a full charge.

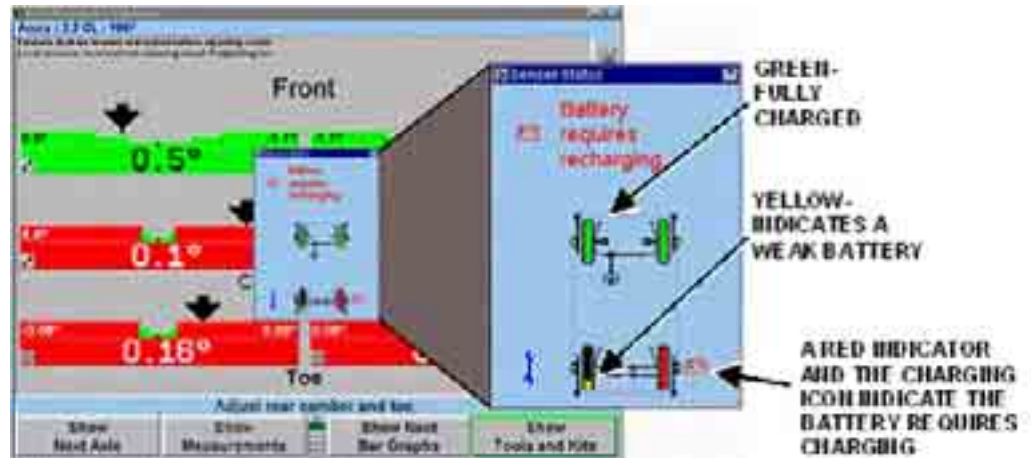
Any sensor that is powered up after being off for a while will initially indicate 100% capacity on the aligner screen. This is not an accurate indication of the charge state of the battery. Within 5 to 10 minutes of operation, the on-screen battery level indicator will settle at its true value. The individual wheels on the screen are color-coded to indicate the actual battery condition.

The following is an indication of battery charging condition:

Green = Fully charged or partially charged

Red (with battery recharging icon) = requires charging

Yellow = Weak battery



The charging circuit has been “fine tuned” to work specifically with part number 194-18-2. Replacement batteries, Eagle Picher part number HE6V7.7, Panasonic part numbers LCR6V9.0P or LC-R067R2P, and B & B Battery part number BP7-6-T1 are available from Hunter, or Eagle Picher, Panasonic, or B & B Battery distributors. Substituting different batteries is not recommended.

Charging Conventional Sensor Batteries (XF Sensors Only)

Each sensor contains a 12VDC sealed lead acid rechargeable battery. To get the maximum life out of the batteries in the sensors, follow these three rules:

If the sensors are not in use, charge them.

Switch sensors “OFF” during charging if you are using cables.

Charge for eleven to thirteen hours, and/or provide an extended charge time (24 hours or longer) at least once a week.

NOTE:

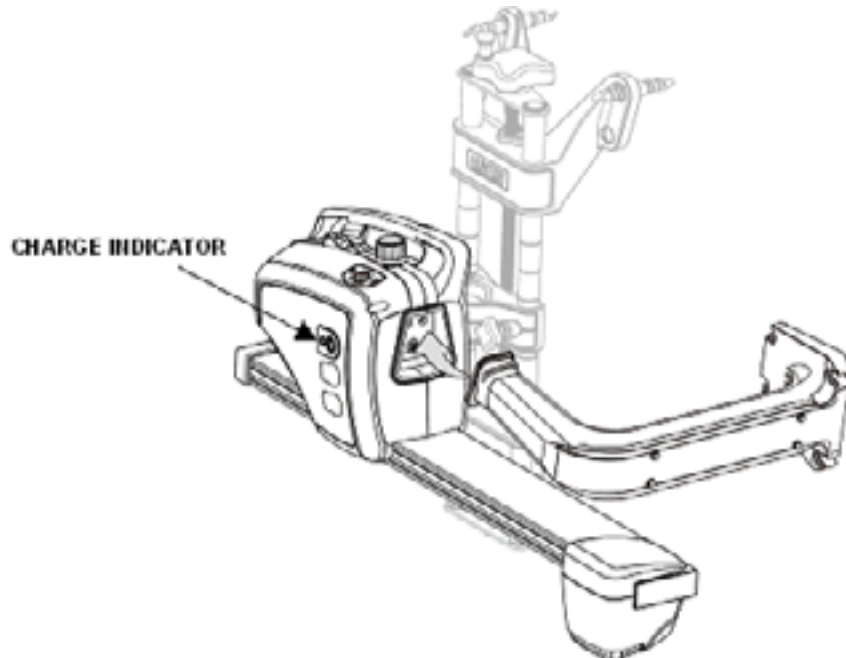
Make sure the main power switch at the rear of the console is left “ON” and the outlet that supplies power to the aligner is on. “K”, “R”, and “P” cabinets are equipped with a computer, printer and CRT, but still provide power to the charging stations when using the standby power switch. This standby power switch is located on the front or side of the cabinet.

The “S”, “SMT-CKD” and “W” cabinets do not have a standby power switch. The computer, printer, and CRT may be switched “OFF” independently from the main power switch.

To prevent premature degradation of battery performance, the charger has to replace 125% of the energy that was removed from the battery. It is not necessary to fully discharge the batteries before charging. However, **it is important they be charged fully.**

Charging Information

To recharge the batteries when the sensors are not in use, place the wheel adaptor sensor assemblies on the cabinet storage hanger and leave the main aligner power on. The “shoe” on which the sensor hangs acts as the – (neg) terminal, and the insulated contact is the + (pos) terminal.



Any time batteries are being charged the charge indicator light on the sensor will be illuminated.

The charge indicator light turning from red to yellow is an indication that the charging mode has switched from a fast charge mode into a “trickle” charge mode. It does not mean that the battery is 100% charged. A fully discharged battery should be allowed to “trickle” charge a minimum of five hours to ensure a full charge. The charge indicator light turns green after approximately 6-8 hours of trickle, indicating the charger has entered “float” mode, which maintains the battery at full charge indefinitely.

You should expect at least 8 hours of continuous use from a fully charged battery.

If you are not getting this amount of usage time, the most likely cause is inadequate charging time.

Batteries that are consistently subjected to partial charging rather than full charge cycles **will permanently lose capacity.**

Charging time for a fully discharged battery with the sensor power switch turned “OFF” is 11 to 13 hours. Three or four times this interval would be required if the sensors were left “ON” during the charge cycle. **It is very important that the sensors be turned “OFF” during charging.** The sensor’s power switch is located on the front of the sensor above the two cable connectors. When the sensor is placed on the storage hanger, it will automatically turn off.

Charging overnight with the sensors’ power switches set to “OFF” will provide a proper charge.

Our charging system cannot over-charge the batteries. If you’re not using the sensors, charge them!

The sensor batteries are rated for 200 full charge/discharge cycles, making their life expectancy about one year for the customer that consistently discharges them 100%. Life expectancy for batteries with lower usage can be significantly longer.

100% Discharge	200 Cycles
50% Discharge	450 Cycles
30% Discharge	1000 Cycles

In a shop with extended service hours, there are some things you can do to prolong battery life:

When the sensors are not being used to perform alignments, they should be stored on the charging hangers with sensor power switched off. At a minimum, turn the sensors “OFF” between alignments. Any charging accomplished throughout the day helps maintain the batteries at peak performance, and helps extend their life.

If you have one day out of the week when alignments are not performed, you can let the sensors charge continuously for 24 hours or longer. This should “undo” the effects of any undercharging that occurred during the previous week. This sort of prolonged charging will only be effective at restoring full capacity to the batteries if performed regularly. Once a week is the recommended minimum.

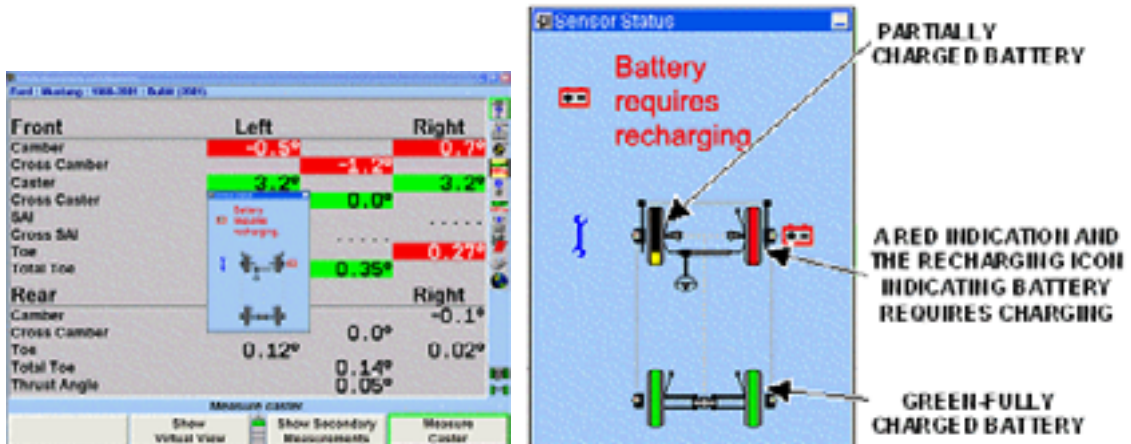
When is it time to replace the batteries?

If after a full charge the battery does not last for the expected 8 hours, you should put it through one or two sessions of extended charge time (24 hours or longer). If the battery does not recover and start giving satisfactory cycle time, then it should be replaced. The sooner you catch the batteries losing capacity, the more likely an extended charge time will restore the battery to normal capacity. If the battery discharge time is only three or four hours, it is unlikely, that extended charge time will help significantly.

Additional information:

Any sensor that is powered up after being off for a while will initially indicate 100% capacity on the aligner screen. This is not an accurate indication of the charge state of the battery. The battery has a “surface charge” which dissipates quickly. Within 5 minutes of operation the on-screen battery level indicator will settle at its true value. The individual wheels on the screen indicate the actual battery condition and are color-coded. The following is an indication of battery charging condition:

- Green = fully charged or partially charged
- Yellow = approximately 20% charge left
- Red (with battery recharging icon) = requires charging



The charging circuit has been “fine tuned” to work specifically with Hunter batteries, part number 194-23-2 (Powersonic part number PS-1223). Substituting different batteries is not recommended.

A sensor that is being used, and has a low battery, can retain its measurement data if a “hot swap” battery replacement is made. Hot swapping the battery requires that the user replaces the battery, and then tilts the sensor completely forward, then completely backward. The sensor settings will be restored and the alignment can proceed.



Battery – Hunter 194-23-2 (Powersonic PS-1233)

6.2 DSP400/600 and Ride Height Targets Care and Maintenance

DSP400/600 and DSP600 series sensors contain no electronic components. These sensors are referred to as “targets.”

Target Maintenance

Keeping the DSP400/600 targets clean is the only required maintenance.

Noticeable dirt build-up, oil or grease can cause target identification problems. In the sensor status popup screen, either of the two icons (shown below) identifies sensors that possibly need cleaning. The text would appear with the icon above the plan view.



(red) “Target not found.”



(black) “Target is found by camera, but not measured.”

When cleaning, use a mild window cleaning solution and soft paper towels to wipe off the targets and wheel adaptors. Do **NOT** spray cleaner directly on the target.



CAUTION: Do not hose down or submerge the targets in water. This could damage the optical components.

Do **NOT** use shop towels to clean targets, not even new ones.

Keep wheel adaptor rods cleaned and lubricated. Lubricate as needed with a coating of light lubricant such as WD-40.

Camera Maintenance


Keep hands and tools away from the camera lens area.

DO NOT attempt to clean the camera lens with standard window cleaner and a cloth, or by blowing on them with shop air. If cleaning ever becomes necessary, it should be done with special optical cleaning fluid (such as lens cleaner available at camera stores) and/or canned air (available at computer stores).

Other than cleaning, all maintenance of the camera should be referred to an authorized Hunter Service Representative.


Care and Cleaning of the Targets

When cleaning, use a mild window cleaning solution to wipe off the targets and wheel adaptors.

 **CAUTION:** Do not hose down or submerge the targets in water, or spray cleaner directly on the target. This could damage the optical components.

Do **NOT** use shop towels to clean targets, not even new ones.

Keep wheel adaptor rods cleaned and lubricated. Lubricate as needed with a coating of light lubricant such as WD-40.

 **CAUTION:** Do not lubricate the center screw shaft of the wheel adaptor. If the adapters are lubricated they should be careful to avoid lubricating the center screw shaft.

Ride Height Target Maintenance

Dirty Targets can Hinder Sensor Performance

The ride height targets incorporate a precision pattern that is analyzed by camera software to determine the location and orientation of the targets on the vehicle. It is apparent that the targets will get dirty with daily use and the software is tolerant to a reasonable amount of pattern obstruction. When the dirt build up gets severe enough, the software will reject the target and declare it “not found”. Cleaning the target will restore proper functionality.

Cleaning the targets, as described below, should be the first step in troubleshooting any ride height target acquisition problem.

NOTE: Keeping the targets clean will ensure the best accuracy.

Target Face Cleaning Instructions

NOTE: Use of shop towels or rags is not recommended as the fibers trap grease which will be deposited back on the target in a thin film as wiping continues.

Armor All® Glass Wipes is the preferred cleaning product, chosen for the film-free results after the cleaning solution evaporates.

Completely wipe the entire face of target.

With an unused portion of the wipe (such as the opposite side), completely wipe the face a second time.

The target is ready for use in 30 to 60 seconds, after the cleaning solution completely evaporates.

NOTE: If targets are heavily soiled or greasy, use an all-purpose cleaner. With the spray cleaners, spray the cleaner on a quality paper towel and then wipe the target. All-purpose cleaners can leave a slight film on the target surface that could hinder target recognition. Follow the removal of heavy soil and grease with Armor All® Glass Wipes, as described above.

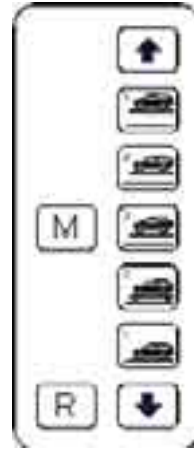
Target Mounting Surface Cleaning Instructions

Use Goo Gone® or similar product to remove built-up adhesive. DO NOT scrape adhesive off the mounting surface.

DSP400L/600L Vertical Lift Control Unit

The system control unit is located on the front of sensor leg. The control unit plugs into a 115V wall outlet and provides electrical power to the processor and the drive motor. The drive motor, sensor, and the safety switches connect to the control unit.

The front of the control unit contains a membrane keypad for controlling beam movement. The membrane keypad is shown below:



Operation

The toggle switch turns the power “ON” and “OFF.”

The “up” or “down” arrow keys move the beam up or down, respectively. The beam moves *only* while the key is depressed and can be positioned at any height by using these keys.

The warning beeper repeatedly sounds as long as the beam is moving. This alerts anyone nearby that the beam is in motion.

Preset Keys

The keys between the “up” and “down” arrow keys allow the beam to be positioned at “preset” heights. To set a “preset” key, do the following:

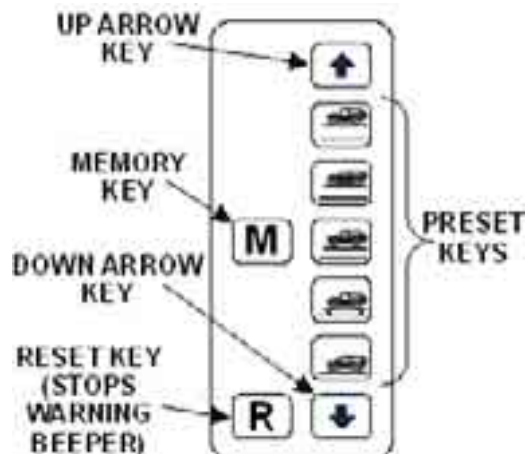
Use the “up” and “down” keys to move the beam to the desired height.

Press and hold the “M” (memory) key.

Press the desired “preset” key.

Listen for three quick beeps. This confirms that the height setting has been stored in memory.

Release the keys.



To use a “preset” key, simply press and release it. The cameras move to the height “preset” for that key. If a height has not been set for a “preset” key, the beeper sounds for about a half second and the beam remains stationary.

The “preset keys” would normally be set for the following heights:

The top key is maximum height.

The bottom key is minimum height.

The next to the bottom key is “normal alignment height.”

The remaining two keys can be set to other desired working heights.

All the stored heights can be removed by holding the “reset” key while the power is turned off.

Safety Switches

The safety switches monitor the travel of the crossbeam. The safety switch is activated when the crossbeam is raised by means other than the mechanical lift (such as a stationary object impeding the lowering movement of a crossbeam).

If the crossbeam is moving and the safety switches actuate, crossbeam movement stops and the warning beeper sounds continuously. The beeping is intended to summon help, if the crossbeam movement is blocked. The beeping continues until acknowledged.

Press the “R” (reset) key on the control panel to stop the beeping.

DSP600LP Lift Controls

The control lever is located on the front of the sensor leg. The lever controls the flow of compressed air (80-120 psi.) into the pneumatic cylinder that raises and lowers the cameras.

DSP600LP-Lift Partial-Sensors have two camera positions. There are no camera stops between the bottom and the top position.

Operation

Position the lever in the lower position to place cameras in the bottom position.

Position the lever in the upper position to place cameras in the top position.

6.3 Remote Indicator

LED

The LED Remote Indicator allows the technician to be “mobile” in the bay while making adjustments to the vehicle. The Operation Instructions for the Remote Indicator is Form 3857T.

Remote Indicator Models 30-418-1, 30-419-1, and 30-421-1

The Remote Indicator allows the technician to be “mobile” in the bay while taking measurements and making adjustments to the vehicle. The Operation Instructions for the Remote Indicator is Form 5382T.

6.4 Digital-PHOTO Option

The optional DVD-ROM displays digital photos of adjustment and inspection points for the specific vehicle being aligned. The Digital-PHOTO system uses a new database of information that includes the translations of all of the text on all of the adjustment photos and line art. Therefore, it is possible to see the adjustment illustrations in any language. Many options are included in the Digital-PHOTO features that can be found in the Illustrating Vehicle Adjustments section of this manual.

6.5 CD/DVD-ROM Handling Instructions

Handle the disk only by its edge.

Do not touch the surface of the disk.



Do not drop the disk.

Do not scratch the disk.

Replacing the CD/DVD-ROM in Systems That Have Tray Type Players

Press the eject button on the CD/DVD-ROM drive to open the CD/DVD-ROM door.

NOTE: Ensure that the tray is vacant before placing a CD/DVD-ROM in the CD/DVD-ROM drive.
--

Place the CD/DVD-ROM in the tray with the printed surface side up.

Press the eject button again to close the CD/DVD-ROM player door.

6.6 Mouse

A mouse is the standard pointing device used with 611 and 811 Aligners.

A flat surface is needed to operate the mouse efficiently. Use Mouse Pad Kit, 20-1434-1, on 811's. The driver for the mouse is installed at the factory.

A light pen and a mouse may both be installed and used.

6.7 Remote Control Transmitter

If the remote control transmitter fails to operate properly, the battery may have to be replaced. This unit requires a nine volt alkaline battery.

NOTE: An alkaline battery is required to provide the proper current for remote transmitter operation.
--

6.8 Program Shell

Program Shell is a feature that allows for customizing softkeys, menu items, and start up files. Applications can be programmed to appear on the last tier of soft keys and/or popup menus for easy access. Program Shell is also used to customize startup and launch options.

This feature is intended for the advanced user who wishes to customize their system.

Customizing with Program Shell

Program Shell Command Lines

Program Shell is modified through PROGSHEL.TXT. The text file can be found in the HEPROGS directory, sub-directories Aligner/shell. Use any text editor such as Note Pad or DOS text editor, to open the file.

When editing PROGSHEL.TXT, it is recommended to use comments to define what function the command lines perform. This will make it easier to understand what has been programmed and to edit PROGSHEL.TXT in the future.

Modifications made to PROGSHEL.TXT will not take effect until the file has been saved and the system is rebooted.

When opened, PROGSHEL.TXT appears in the following format:

```
Progshel.txt
#      This is a comment.
#      Blank Lines are also ok
PROGRAM   "C:\WINDOWS\notepad.exe"
MENUTEXT  "Notepad"
LOGOONLY
SOFTKEY   "Start\notepad"
```

Program Shell uses two types of lines, comments and command lines.

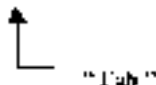
The “#” preceding a line, indicates that the line is a comment, documentation which explains what the following command lines do, names author of the command lines, shows the date the command lines were added and/or offers any other information pertinent to the command lines.

A line that is not preceded by the “#” is a command line. Command lines perform specific functions that will be explained later in this document.

Blank lines or carriage returns are allowed.

Use a “Tab” to separate fields. Do not use the “Spacebar” to place spaces between fields as this will give a syntax error

```
PROGRAM           "C:\WINDOWS\notepad.exe"
```



Program Shell command lines must begin with a command, followed by the parameters required to execute the command. The following are the command lines used by Program Shell:

PROGRAM
MENUTEXT
LOGOONLY
SOFTKEY
IFEXISTS
STARTUP
DIRECTORY

PROGRAM identifies the executable command line of a specific program. This is how Program Shell knows which program is being used for the commands that follow.

MENUTEXT adds the program identified in the PROGRAM line as a choice on a popup menu. Popup menus appear on bar graphs and in Point and Click Inspection screens.

LOGOONLY The LOGOONLY keyword is used in conjunction with the SOFTKEY keyword to limit where a softkey will appear. If the LOGOONLY keyword is used, then the new softkey will appear only on the logo screen. If LOGOONLY is not used, then the key will appear on all primary screens (i.e. Measurements, Specs, Work Management and Inspection).

SOFTKEY adds text on a soft key associated with the program designated in the PROGRAM line.

The following entry in PROGSHEL.TXT identifies a program and adds text to the soft key and menu item to be used as shortcuts to the program. (Note that the remarks, designated by the "#," give the information relating to the following command lines.)

```
#      The following is an entry for a single program
#      The program line contains the exact command line
#      for the program. The MENUTEXT line contains the text
#      that will appear in a popup menu. The SOFTKEY item
#      contains the text that will appear on the softkey.
PROGRAM    "C:\WINDOWS\notepad.exe"
MENUTEXT   "Notepad"
LOGOONLY
SOFTKEY    "Start\nNotepad"
```

The `\n` creates a new line of text. In the above example, the SOFTKEY command line reads "Start\nNotepad." This command line will create a soft key with two lines of text, "Start" being the first line, and "Notepad" being the second line. If Start Notepad were to be one line of text on the soft key, the command line would read "Start Notepad."

The following example will add a menu item and a softkey to access Notepad, add a menu item, and add one line of text to the soft key:

```
#      The following is an entry for the Notepad program
#      The program line contains the exact command line
#      for DOS. The MENUTEXT line contains the text
#      that will appear in a popup menu. The SOFTKEY item
#      contains the text that will appear on the softkey.
PROGRAM    "C:\WINDOWS\command.com"
MENUTEXT   "Notepad"
LOGOONLY
SOFTKEY    "Start Notepad"
```

IFEXISTS displays a program on a softkey and creates a menu item only if the program exists on the system.

```
#      The IFEXISTS line will display NetScape only if it
#      exists on the system.
PROGRAM    "C:\applicat\netscape\program\netscape.exe"
IFEXISTS   "C:\applicat\netscape\program\netscape.exe"
MENUTEXT   "NetScape"
LOGOONLY
SOFTKEY    "Start NetScape"
```

In this example, a softkey labeled "Start NetScape" and a menu item labeled "NetScape" will be created only if the program NetScape exists on the system.

STARTUP is used to launch programs on startup of the system. The following example will open Paint Shop Pro when the WinAlign is launched.

```
#      The following will cause the PaintShop Pro
#      Application to be launched at startup.
#      This item will be started up, but it will
#      not appear on the soft key or menu bar.
PROGRAM    "C:\PSP\PSP.EXE"
STARTUP
```

DIRECTORY is used to launch an application from within the working directory. The following example will create a softkey that launches Mitchell Undercar from the working directory.

```
#      The following item will appear only on
#      the popup menus, not on the soft keys.
PROGRAM    "C:\mitchell\repair\uwin\uwin.exe"
```

```
IFEXISTS      "C:\mitchell\repair\uwin\uwin.exe"
DIRECTORY     "C:\mitchell\repair\uwin
MENUTEXT      x0A060000
```

PROGRAM, SOFTKEY, and MENUTEXT, also have some special syntax that can be used to avoid absolute paths. In the following example, %HEP% is a vocabulary item which provides the path for the HEPROGS directory.

NOTE: Vocabulary items provide translation processes for programmers and are not intended for use by the general user.
--

The example, vocabulary item x1A000000, provides the vocabulary item on the softkey and menu item, which identifies "Braketester."

```
#      To avoid absolute paths, the following syntax
#      can be used. The string %HEP% will be replaced
#      with the HEPROGS directory with the appropriate
#      drive letter to produce
#      "C:\HEPROGS\braketst\execute\braketst.exe.
PROGRAM     "%HEP%\braketst\execute\braketst.exe"
MENUTEXT    x1A000000
LOGOONLY
SOFTKEY     x1A000000
```

6.9 WinAlign Multi-disk Backup/Restore

The WinAlign Multi-disk Backup/Restore procedure saves files modified by WinAlign to floppy disk(s). The saved files can be restored later by using the restore procedure.

NOTE: The restore procedure does not install the WinAlign software.
--

WinAlign modifies files when any of the following occur: setup is changed, a vehicle specification is stored, a vehicle specification note is stored, the logon registry is changed, a work order is stored, a form letter is stored or a filter is stored.

Backup should be performed on a regular basis. How often backup is performed depends on what features of WinAlign are used. The following backup schedules are suggested:

If you do not use Work Management then back up weekly.

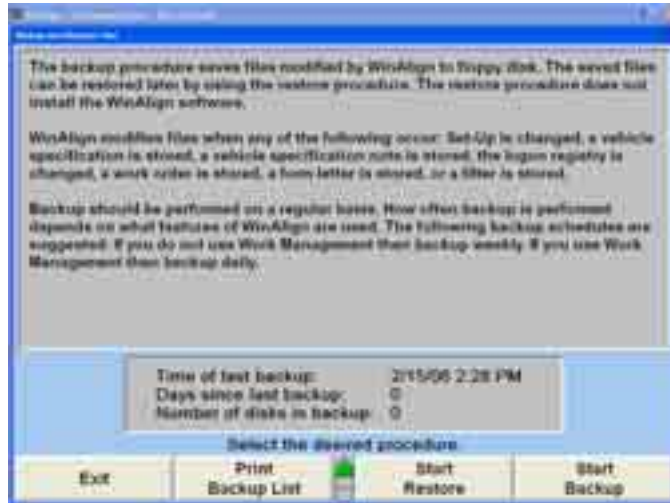
If you use Work Management, then back up daily.

Backup and Restore Procedures

To access the Backup/Restore utility, press “Service Programs” on the logo screen. The menu labels will change.

Press “Backup and Restore” from the “Service Programs” softkey menu.

The Backup and Restore screen presents initial information about WinAlign backup. It also displays the time of the last backup, the number of days since the previous backup, and the number of disk(s) in the most recent backup set.

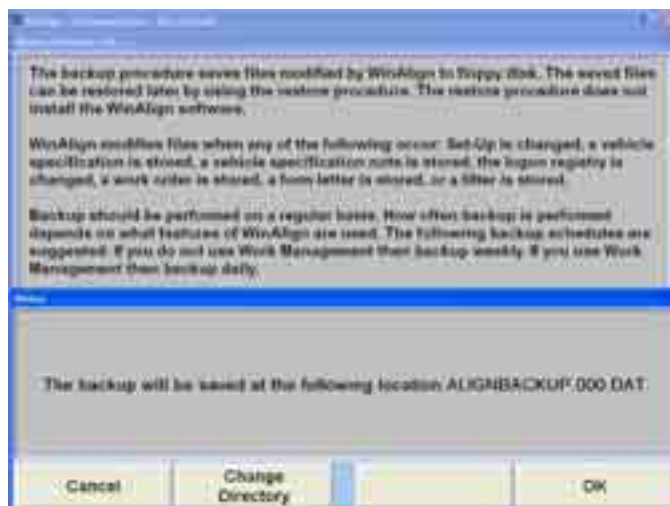


Backup Procedure



CAUTION: If the machine is reset, or the backup procedure is canceled at anytime during the back up procedure, WinAlign deletes the backup file from the floppy disk and the backup is invalid. It is strongly recommended that Cancel or Reset is not used during the procedure.

Select “Start Backup.” The program defaults to installing on a floppy disk on the A: drive. Select “Change Directory” to install in a different location.



Double-click on the directory to install the backup.



Insert removable media into the appropriate drive, or select C: to install on the aligner hard drive.

WinAlign will check the media for formatting, write-protection, and the existence of previous back up data. If the media contains an earlier backup, WinAlign will inform the user that the disk contains data, and asks for confirmation to overwrite the information. Select “OK” to proceed with the backup.


CAUTION: If the media contains the latest backup prior to the one being performed, it is recommended not overwrite the disk. Select “NO.” WinAlign will prompt to insert another removable media. Insert a disk, either blank or from another set, and begin backup process again.

If the backup requires more than one disk or media, WinAlign will prompt to remove, and label as “WinAlign Backup” followed by the disk number and the current date and time and to insert a new disk for each disk required to complete a successful backup.

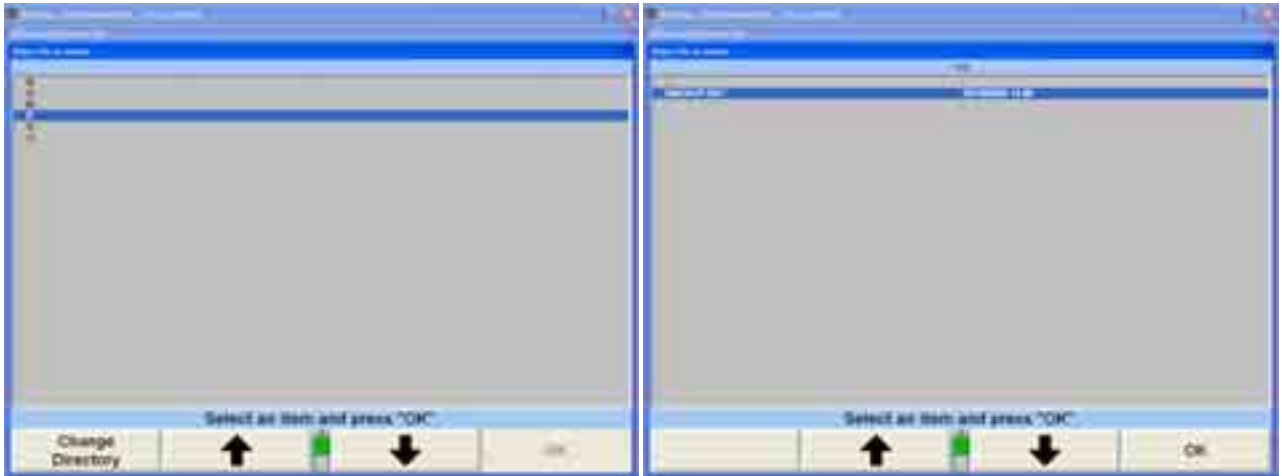
After WinAlign completes the backup procedure, the user will be prompted that backup was successfully completed. Select “OK” and exit backup program.

Label the floppy disk(s) or media as “WinAlign Backup” followed by the disk number and the current date and time.

Restore Procedure

Begin the restore procedure by selecting the  on the Backup and Restore Files screen.

Insert disk one of the current backup into drive A or select a different directory for other removable media, or the hard drive. WinAlign will verify that the information can be read and that it is a valid backup.



If the backup data being restored requires more than one disk, WinAlign will prompt the user to insert each disk in the set (one at a time) to verify each disk. Remove and insert the appropriate disk as requested.

NOTE: This step is a necessary step for the restore procedure. It insures that all of the disks in the backup set are accounted for so that the restore procedure may begin. If you do not have all of the disks for the restore procedure, you can cancel Restore at this time by selecting "Cancel."

CAUTION: After WinAlign has verified all the disks in the backup set, it will prompt to insert disk one of the set again. It is at this point that the restore procedure begins. If the restore procedure is interrupted at any time during the process, one or more files in WinAlign may be corrupted. This would require a complete re-installation of WinAlign.

Select "OK" when the "Restore completed successfully" screen appears, and exit the restore program.



6.10 Electronic Keys

Included with a shipment of diskettes are one or more electronic keys that look similar to large watch batteries. These keys are needed to run the WinAlign program. If the program is loaded onto a 411/611 unit without the proper keys being inserted in the Hunter Interface Board or Hunter Interconnect Board, an error message will appear, similar to the one shown below on the left.



Electronic keys can be placed in any of the available sockets on the Hunter Interconnect Board and/or the electronic key holder. It does not matter which key is in which socket.

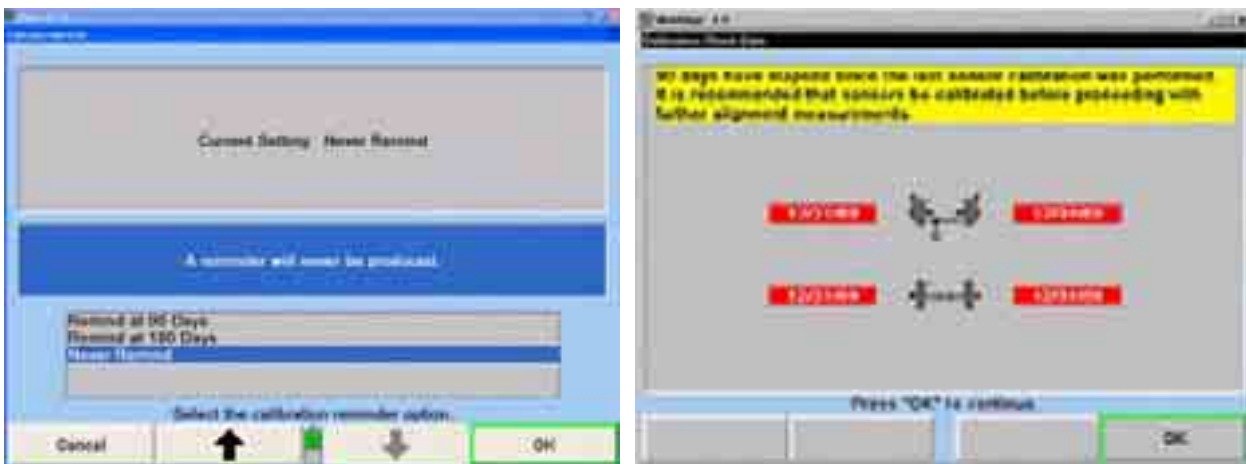
A red key is always required to run WinAlign. A green key is required to access the Factory Specification Database. If the aligner has a CD-ROM, an orange key is required to use the WinAlign features, which access the CD-ROM, such as the digital photos (adjustment illustrations and inspection illustrations) or the MPEG video segments (Just-In-Time Training™ and adjustments videos).

WinAlign will **NOT** operate properly if the required electronic keys are not installed!

Additional keys can be used to allow access to other features within WinAlign. An additional orange key provides access to Digital-VIDEO and Digital-PHOTO. A yellow key provides access to features that meet the needs of certain national accounts.

6.11 Conventional Sensor Calibration

A calibration reminder can be enabled in Set up to notify the user at specified intervals to calibrate the sensors.



The reminder can be set for every 90 days, every 180 days, or never. It is recommended to perform calibration at least every six months.

Calibration General Information

For additional information, refer to *Calibration Instructions, Form 3720T*, or *DSP300 Series Sensor Calibration Instructions, Form 4059T*, or *Service Calibration Instructions for DSP500 Series Sensors, Form 5047T*.

Calibration must be completed prior to operation of the sensors. Failure to successfully complete the calibration procedure will inhibit all of the alignment functions of the system.

The calibration data for the sensors is stored in the sensors. Replacing the transducer control circuit board in a sensor will require the sensor to be re-calibrated.

Sensors are calibrated in sets and should be kept in sets so that unnecessary recalibration is not required. If, however, the front or rear sensors of one set are used with the front or rear sensors of another set, "Zero Only" calibration must be performed on the new set.

A calibrated set of DSP100, DSP200, and DSP250 series sensors can be used with a M111, 211, 311, 411, or 611 aligner.

A calibrated set of DSP306 or DSP308 series sensors can be used with any 211, 411, 611 aligner using WinAlign® software version 2.0 or higher, or a 311 Series aligner.

A calibrated set of DSP306 HF or DSP308 HF series sensors can be used with any 211, 411, or 611 aligner using WinAlign® software version 2.0 or higher.

A calibrated set of DSP506 or DSP508 series sensors can be used with any aligner using WinAlign® software version 7.1 or higher.



CAUTION:

The prisms used for calibrating conventional sensors (DSP100, 200, and 250 Series Sensors) must be kept clean to avoid inaccurate calibration. A fingerprint, a piece of dirt, or a coating of dust may result in inaccurate calibration. Use an ammonia based glass cleaner with a CLEAN soft tissue or cotton swab to clean the prisms. Clean the prisms before every use.

The calibration procedures must be followed carefully. An accurate calibration will not be obtained if procedure performance is rushed.

The information in this section is applicable to all DSP100, 200, 250, 306, 308, 506, and 508 Series Sensors unless otherwise indicated.

Mounting DSP Sensors

Remove the sensors from the wheel adaptors.

Carefully slide the shafts of the left and right front sensors into their respective calibration shaft hubs in the front calibration shaft. (The front of the calibration fixture is indicated by arrows painted on the baseplate.)

Carefully slide the shafts of the left and right rear sensors into their respective calibration shaft hubs in the rear calibration shaft.

NOTE:

To prevent the calibration fixture from tipping over after mounting the first sensor, mount the second sensor on the opposite side of the calibration fixture.

NOTE:

The sensor shafts must be fully inserted into the shaft hubs. The hex-shaped shoulder of the sensor shaft must contact the flat face end of the calibration shaft.

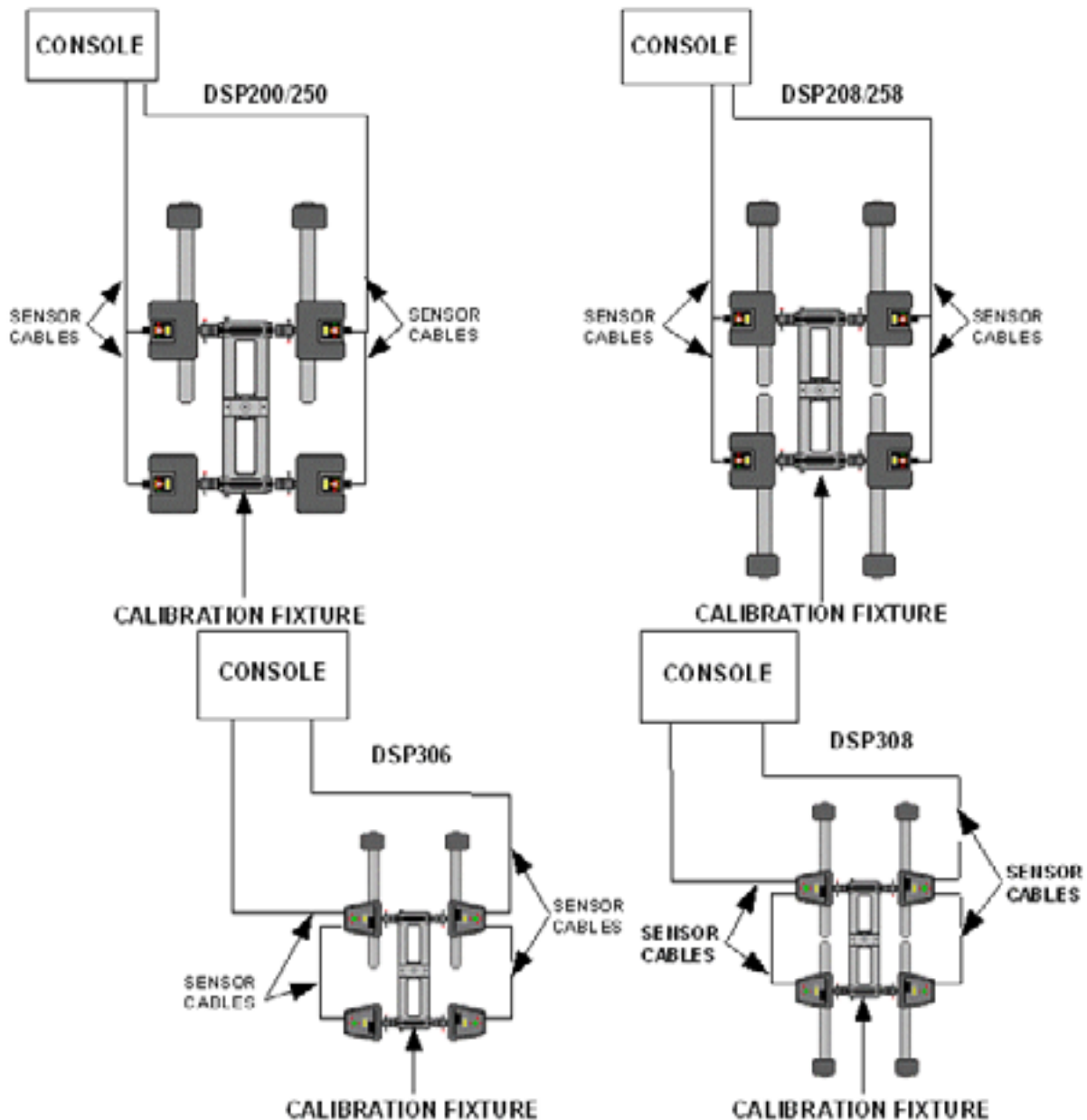
DSP100, 200 and 250 Series Sensors: The toe arms should rest on the top of the round cams at the forward end of the toe arm rests.

Finger tighten the thumbscrews on all four calibration shaft hubs to hold the sensors in place.

CAUTION:

The thumbscrews must be as tight as you can tighten them with your fingers. Do NOT use a wrench. There must be no looseness between the calibration shaft and the sensor shaft. Check for looseness and make sure there is no play between the sensor and its shaft.

Connect the sensors to the console using the sensor cables, as shown below.



Leveling the Calibration Fixture

Unscrew the RED and BLACK screws in the baseplate so that the fixture is resting on only the three SILVER leveling screws. One silver screw is located at the front of the fixture and two at the rear of the fixture.

Position the level left-to-right on top of the rear calibration shaft. To verify the level is accurate, *refer to the Calibration Fixture Adjustments for procedures to check the level assembly.*

If necessary, adjust the two setscrews in the aluminum casting on either side of the level so that the level is held vertical.

Adjust the two **rear** SILVER leveling screws until the rear calibration shaft is level left-to-right. Recheck by reversing the level assembly on the shaft.

Position the level front-to-rear on the top of the two flats at the center of the aluminum casting.

Adjust the single SILVER leveling screw at the **front** of the fixture until the calibration fixture is level front-to-rear. Recheck by reversing the level assembly on the aluminum top casting.

Recheck the left-to-right and front-to-rear level of the fixture, and make adjustments as necessary.

Position the level assembly left-to-right on the top of the front calibration shaft to check it for level. The front calibration shaft should be level. *If necessary, refer to the Calibration Fixture Adjustments for procedures to re-level the top casting.*

NOTE:	Both front and rear calibration shafts must be level and the fixture must not “rock.”
-------	---

Screw down the two front RED screws (in the fixture baseplate) to meet the table surface. The fixture should now be resting solidly on five leveling screws (two RED and one SILVER at the front, and two SILVER at the rear).

Leveling DSP100, DSP200, and DSP250 Series Sensors:

Level each rear sensor by observing the level in the sensor and tightening the sensor lock knob.

Level the front sensors by resting the toe arms on the toe arm supports at the front of the calibration fixture. A small weight (one or two ounces) should be placed on the top of each toe arm to hold it against the support.


NOTE:	If the toe arm supports have been damaged or abused, or if the level on top of the toe arm rest bar has shifted, readjust the toe arm supports. <i>Refer to the Calibration Fixture Adjustments for details.</i>
-------	--

Leveling DSP300 Series Sensors:

Observe the sensor level while leveling the sensor. Adjust the sensors until the bubble is centered in the level. Tighten the sensor lock knob.

Starting the Calibration Procedure

Turn on the system. Verify the logo screen is displayed.

Press the menu shift key, , until the “Service Programs” softkey is displayed.

Press the “Service Programs” softkey.

Press the “Calibrate Aligner” softkey.

Procedure Basics


The screen will guide you through the calibration steps. At the beginning, you will answer questions about what is to be calibrated, after which the program will follow the appropriate procedure based upon your response.

Pressing “Backup” during the calibration procedure will display the previous step. If desired, you may “backup” all the way to the beginning of the calibration procedure.

To illustrate what is desired at each step, the screen will show a “plan view” of the sensors mounted on the calibration fixture. When the procedure calls for an operation to be performed on the sensors, the graphics on the screen will clearly illustrate what is required.

After you have done what the screen requires, press the “Ready” softkey. The aligner will instruct the sensors to save certain information from the transducers. The sensors will wait until the required transducers have valid and stable data, and then save it. While the sensors are waiting for the data to stabilize, you will be instructed to wait. You can abort this waiting by pressing “Pause,” at which time the screen will require you to repeat the step.

On some steps of the procedure, the sensor software will use the data that has been saved to compute and check a calibration coefficient. If the new coefficient is in error, the screen will show which transducer has the error and what the error is; either a procedure error, or an improperly mounted or malfunctioning transducer.

If a calibration error is shown, you have the options of pressing “Backup” and repeating the step, pressing “Continue” and ignoring the error, or pressing “HELP”, then the  key, and then “Sensor Diagnostics”, which pops up the Sensor Diagnostics screen.

The Sensor Diagnostics screens function exactly as they do for the alignment operating software. If you press “Continue,” you will be returned to the step you were on in the calibration procedure when you pressed “Sensor Diagnostics.” You may go to the Sensor Diagnostics screen at any time to view the intermediate results of the calibration procedure or to diagnose a problem.

<p>NOTE: When the sensors are mounted on the calibration shafts, the weight of the sensors causes the shafts to bend downward slightly. When the camber transducers are zero adjusted, their measurements are offset from zero by the amount of this “droop,” and so a small offset equal to this droop is applied to the zero calibration coefficient. This means that the camber transducers should not measure zero when mounted on the calibration fixture and shown on the diagnostics screens. If the compensated angles are shown, the camber transducers should directly measure the “droop.” Because the different sensor types have different weights, the offset varies as well. The displayed compensated camber angle should correspond to the following chart.</p>

SENSOR	DSP100	DSP200	DSP208/250HF/258HF	DSP250	DSP258
Left Front	.11°	.14°	.14	.13°	.13°
Right Front	.11°	.14°	.14	.13°	.13°
Left Rear	.09°	.11°	.14	.10°	.13°
Right Rear	.09°	.11°	.14	.10°	.13°

SENSOR	DSP306	w/long bar	DSP306 HF	w/long bar	DSP308	w/long bar	DSP308H F	w/long bar
Left Front	.16°	.05°	.20°	.09°	.16°	.05°	.20°	.09°
Right Front	.16°	.05°	.20°	.09°	.16°	.05°	.20°	.09°
Left Rear	.11°	.04°	.15°	.08°	.16°	.05°	.20°	.09°
Right Rear	.11°	.04°	.15°	.08°	.16°	.05°	.20°	.09°

NOTE: Power must not be removed from the sensors during the calibration procedure. If a sensor loses power, the data saved during intermediate steps will be lost. The screen will inform you that this has occurred, and will automatically restart the procedure.

Selecting What to Calibrate

The camber/caster adjust transducers of the DSP Series Sensors are designed so that it is unlikely the “range calibration” will change. Do NOT perform a “Full Calibration” on any transducer unless that transducer or sensor circuit board has been adjusted or replaced. If it is necessary to range calibrate a transducer, range calibrate only that transducer.

Toe transducers are range calibrated every time a zero calibration is performed.

IMPORTANT: When calibrating DSP Series Sensors, if one transducer is replaced or adjusted, the opposite (left or right) transducer must be calibrated also.

The calibration primary screen shows what is to be calibrated.



Changing the calibration selections:

Press “Select Sensor Type” to pop up a screen to select the sensor type to be calibrated.

Press “Select Sensors” to pop up a screen to select which sensors are to be calibrated.

Press “Select Transducers” to pop up a screen to select which transducers are to be calibrated.

Press “Select Procedure” to pop up a screen to select either a “Full Calibration” or “Zero Calibration” procedure.

These four popup screens operate in the same manner. The screen pops up to show the following:

The title of the screen shows what is to be selected.



The possible selections are listed in a box at the bottom of the screen.

The current selection is highlighted in the box.

An explanation of the current selection is shown in the center of the screen.

For example, the “Sensor Selection” popup screen appears as follows:



To change the selection, press  or  as needed to highlight the desired selection, then press “OK.”

Example:

The longitudinal toe transducer in the left front sensor has been replaced. Calibrate only that transducer by making the following selections:

Select DSP sensors.

Select LF only.

Select longitudinal toe only.

Select range and zero.

Follow the instructions.

Example:

The right rear transducer control board has been replaced. Calibrate all transducers in that sensor by making the following selections:

Select DSP sensors.

Select RR only.

Select all transducers.

Select range and zero.

Follow the instructions.

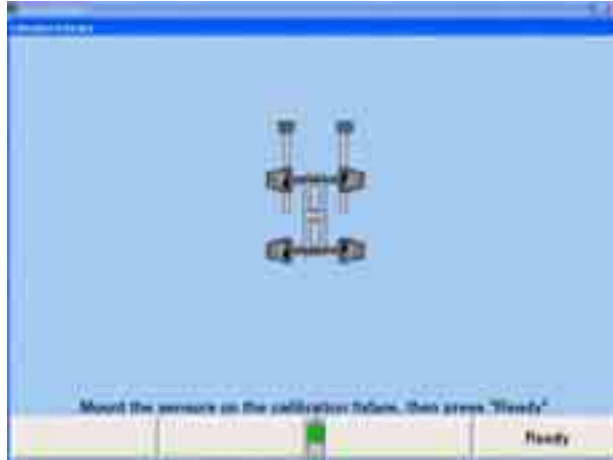
NOTE: The transducers of the DSP100, 200, and 250 Series Sensors are designed so that it is extremely unlikely that the “range calibration” will change. For this reason, do NOT range calibrate a transducer unless that transducer or transducer control board has been replaced or repaired. If necessary to range calibrate a transducer, range calibrate only that transducer.

NOTE: The transducers of the DSP300 Series Sensors are designed so the “range calibration” will change and affect the opposite transducer. For this reason, you must perform a “Full Calibration” when that transducer or sensor circuit board is adjusted or replaced.

Performing the Calibration (Conventional Sensors)

Based on the selected sensors, transducers and procedure, the screen will prompt you through the necessary steps of the calibration process.

Press “Calibrate Sensors” to begin the procedure. The screen pops up with instructions to mount the sensors on the calibration fixture, as shown:




The screen shows the status of each sensor and of each transducer. Go to the “Sensor Diagnostics” screen to verify that the transducers function properly and that the boresight readings are within limits.

Press “Ready” when the sensors are ready to calibrate. The system will wait until the necessary transducer readings are stable, and then will capture the first readings.

CAUTION: Do not rush the calibration process. The more patient and careful you are, the better the calibration will be.

The screen will prompt you, step-by-step, through the remaining steps of the procedure, which include some combination of mounting prisms, tilting the fixture with spacers, compensating the sensors for runout, and leveling the sensors for zero calibration. The actual steps to be performed will vary, depending on which sensors and transducers are to be calibrated.

NOTE: At any time during the calibration procedure, the “Sensor Diagnostics” screen may be viewed by pressing the softkey labeled “HELP,” then the  key, and then “Sensor Diagnostics.” From the “Sensor Diagnostics” screen, “Sensor Data” or “Transducer Data” screens may be viewed. Pressing “OK” will return the screen to the same point in the calibration procedure.

Mounting Prisms for Toe Transducers (DSP100, 200, 250 Series Sensors)

When installing prisms for calibrating conventional sensors, the letter displayed on the CRT corresponds to the letter on the prism. When properly installed, the letter on the prism is at the top where it can be read normally. The graphics on the screen show what the prism should look like when viewed “face on.”

When the screen prompts for a prism to be installed for a longitudinal transducer, insert the prism into the opening at an angle and slide it into place until it is fully seated (flush with the cover). To remove it, pull the knob outward.

When the screen prompts for a prism to be installed for a transverse transducer, insert the two pins on the back of the prism into the holes of the transducer front plate so that the plate holds the prism by the grooves cut into the pins. To remove it, lift it slightly and pull outward.



CAUTION: When mounting prisms, very little force is required. Be extremely careful to not move the sensors, especially with transverse transducers.

Mounting Spacers for Camber and Caster Adjust Transducers (All Sensors)

Follow the instructions displayed on the screen and press “Ready” after each step.

If an error is made during the calibration, pressing “Backup” can redo the step. Repeat the step and continue the procedure.

When the screen prompts for spacers to be installed under the side of the fixture, lift the fixture using the BLACK screw at the middle of the indicated side. Position one of the thinner spacers under the RED leveling screw at the front and one under the SILVER leveling screw at the rear. Lower the fixture onto the two thin spacers.

When the screen prompts for spacers to be installed under the front of the fixture, lift the fixture using the BLACK screw at the front. Position one of the thicker spacers under each RED leveling screw at the front of the fixture. Lower the fixture onto the thick spacers.

Compensating Sensors for Runout (DSP100, 200, and 250 Series Sensors)

The sensors must be compensated for runout prior to zero calibration. The screen will prompt when this must be done. A “2-point” calibration procedure is performed, as follows:

Rotate the two calibration shafts so that the thumbscrews are on the bottom side of the shafts.

Level and lock the sensors.

Press and release the compensation switch on each sensor.

When the RED compensation LED on each sensor is flashing, rotate the front calibration shaft 180 degrees as follows:

Unlock the front sensors.

Loosen the front calibration shaft lock knob.

Rotate the front calibration shaft 180 degrees until the green LED's of both front sensors are illuminated.

Tighten the front calibration shaft lock knob.

Level and lock the front sensors.

Rotate the rear calibration shaft 180 degrees as follows:

Unlock the rear sensors.

Loosen the rear calibration shaft adjustment knob.

Rotate the rear calibration shaft 180 degrees until the left rear sensor, green LED illuminates.

Lock the left rear sensor.

Level the left rear sensor by rotating the rear calibration shaft.


Tighten the rear calibration shaft adjustment knob.

Level and lock the right rear sensor, ensuring that the green LED is illuminated.

Press and release the compensation switch on each sensor.

When the RED compensation LED on each sensor is illuminated, press "Ready."

Zero Calibration

 **CAUTION:** Perform this step slowly and carefully. The most critical calibration of an alignment sensor is "Zero Calibration."

After compensating for runout, when the screen prompts, remove all prisms and spacers.

Verify that the sensors are in the position that will be called ZERO.

Verify that all spacers and prisms are removed, and then recheck the levelness of the calibration fixture and the sensors.

Press "Ready."

Storing Calibration Results

When the screen prompts that it is ready to store calibration, press "Ready." The new calibration data will be stored in the sensors, and the old calibration data will be deleted.

NOTE: The calibration results may be stored, even if the calibration procedure resulted in errors. For example, if only one transducer indicated an error, the results of the entire procedure could be stored, that one problem corrected, and then recalibrate only that transducer.

Finishing Calibration

When the calibration process is complete, do the following:

Remove the sensors from the calibration fixture and remount them on the wheel adaptors.

Remove the calibration shafts from the calibration fixture and place them in the compartment in the fixture base.

Store the fixture in a dry location.

Calibration Fixture Adjustments

Verify that the level assembly is calibrated by placing it on a reasonably level, flat surface, noting the position of the bubble.

Rotate the level assembly 180 degrees. If the bubble is floating to the right or left of center for example, then rotating the level assembly 180 degrees should also show the bubble floating in the same direction. This verifies that the level is calibrated correctly and is indicating an out of level surface.

If the level is not in the same position after rotating the level assembly 180 degrees, remove the cover to gain access to the level mounting screws. Adjust one screw only to position the bubble to a point midway between the first and second position.

Repeat the operation and adjustment if required.

After level calibration, replace the cover.

Adjusting Cams for DSP100, 200, and 250 Series Sensors

The toe armrest bar cams should be adjusted using a new set of sensors with their levels correctly adjusted.

Adjust the toe arm rest bar 3/4 inch down from the bottom edge of the toe arm rest plate and tighten the hex nuts above and below the bar.

Install the front and rear calibration shafts in the “V” notches of the aluminum top casting.

Install thrust washers.

NOTE:	Both spring loaded thrust washers must be located on the same side of the fixture. Either side may be used.
--------------	---

Make sure the adjustment knobs for the shaft leveling blocks face toward the outside of the fixture.


Insert the eight dowel pins/leveling rods through the holes in the top casting and calibration shaft hold down blocks. Loosen the hold down block thumbscrews as needed to allow the dowel pins to line up with the holes in the hold down blocks, then adjust the thumbscrews until the hold down blocks are approximately leveled.

NOTE:	Do NOT fully tighten the thumbscrews. Over tightening the thumbscrews can warp the casting or distort the calibration shafts, resulting in calibration errors.
--------------	--

Mount the sensors on the calibration fixture

Carefully slide the shafts of the front sensors into their respective calibration shaft hubs at the front of the calibration fixture. The calibration fixture has arrows painted on the baseplate, which indicate the front of the fixture.

Carefully slide the shafts of the rear sensors into their respective calibration shaft hubs at the rear of the calibration fixture.

 CAUTION:	The sensor shafts must be fully inserted into the calibration shaft hubs. The hex-shaped shoulder of the sensor shaft must contact the flat face end of the calibration fixture shaft. The toe arms should rest on the top of the round cams at the each end of the toe arm rest.
---	---

Finger tighten the thumbscrews on all four calibration shaft hubs to hold the sensors in place.

CAUTION: The thumbscrews must be finger tightened only. Do NOT use a wrench. Verify there is no play between the sensor shaft and the calibration shaft.

Level the fixture as described in “Leveling the Top Casting.”

Rotate the toe arm rest bar cams until they support the front sensor toe arms in the level position. A small weight (one or two ounces) should be placed on the top of each toe arm to hold it against the support. Tighten the 1/4 inch hex head screws that hold the cams in place.

Adjust the cartridge level located on top of the toe arm rest bar to read level when the fixture is leveled.

Leveling the Top Casting

It is possible for the top casting to be incorrectly mounted to the baseplate so that the adjustment screws cannot compensate for the misalignment. If either of the calibration shafts cannot be leveled, this is an indication that the casting is mounted incorrectly. When this condition is present in your calibration fixture, adjustment of the hex nuts and studs that mount the casting will be necessary.

Position the level assembly left-to-right on the front calibration shaft and verify level. Make the necessary corrections by adjusting the front 3/8 inch hex nuts that are located above and below the aluminum top casting on the studs that mount the casting to the base assembly. Recheck level by reversing the level assembly on the shaft.

Repeat the previous step on the rear calibration shaft.

Position the level front-to-rear on top of the two flats at the center of the aluminum casting and verify level. Make the necessary corrections by adjusting the 3/8 inch hex nuts that are located above and below the aluminum top casting on the studs that mount the casting to the base assembly.

Tighten all locking nuts securing the assembly.

Recheck to verify that the casting left-to-right, and front-to-rear are still level.

Zero Calibration Using the Long Calibration Bar

Software Requirements

A set of DSP306, DSP306-HF/HFSS, DSP308, or DSP308-HF/HFSS Series Sensors, can be calibrated with the long calibration bar and any 411 or 611 wheel aligner using WinAlign software version 4.1 or higher.

DSP Sensor Preparation

Remove the sensors from the wheel adaptors.

Rotate the sensor shaft so the index mark is in the 12 o'clock position.

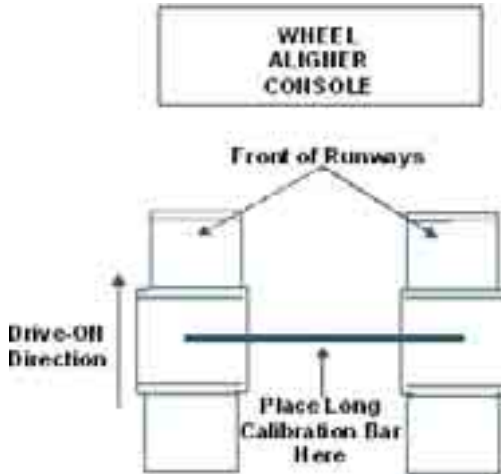
Lock the shaft in this position using the sensor lock knob.



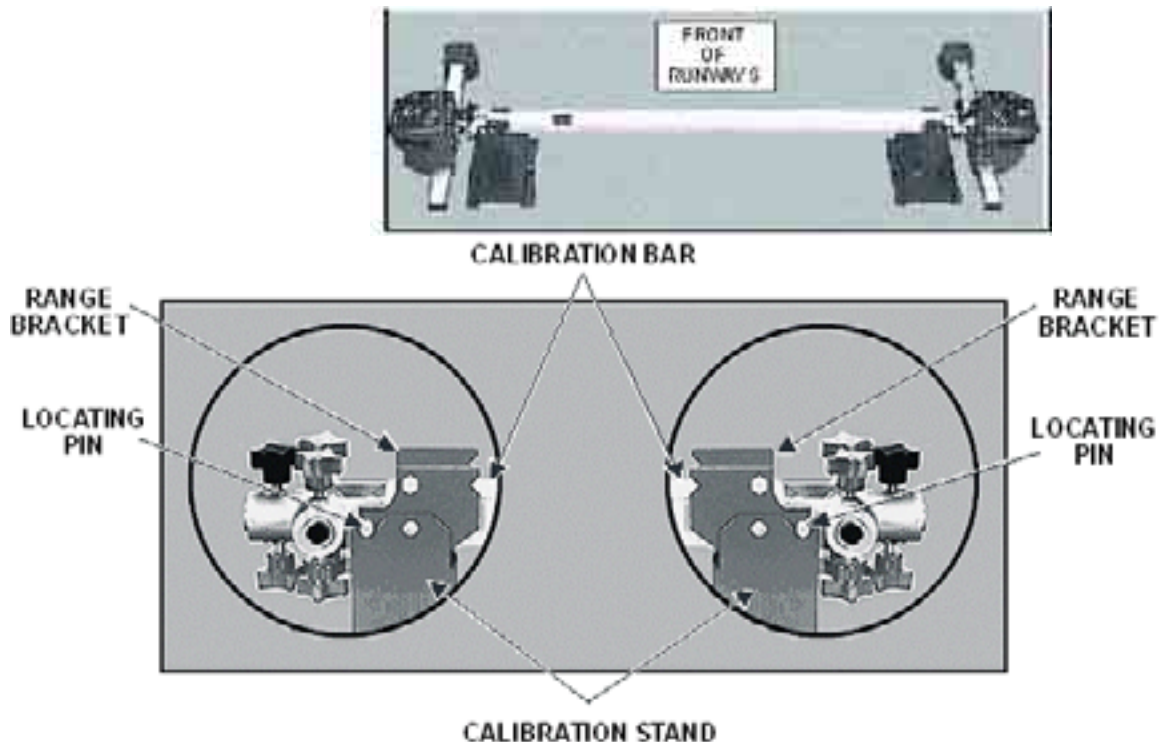
NOTE: Older model sensors will not have the machined index mark notch. For these sensors, assign an index (sensor shaft position is not critical) using a permanent marker, and use this index mark for any future calibration.

Installing the Calibration Bar and Stands

The calibration bar and stands must be placed on a reasonably level, smooth, solid, stable surface to perform the calibration procedure. The forward section of the lift rack that is used for wheel alignments is recommended, as seen below.



The photo below illustrates a typical installation with front sensors mounted. This is the viewpoint from which all calibration instructions are described.



The locating pins on the calibration bar must be captured in the u-shaped notches on both sides of the range bracket. The range bracket is attached to the top of the calibration stand. Position the calibration bar on the stands as shown above.

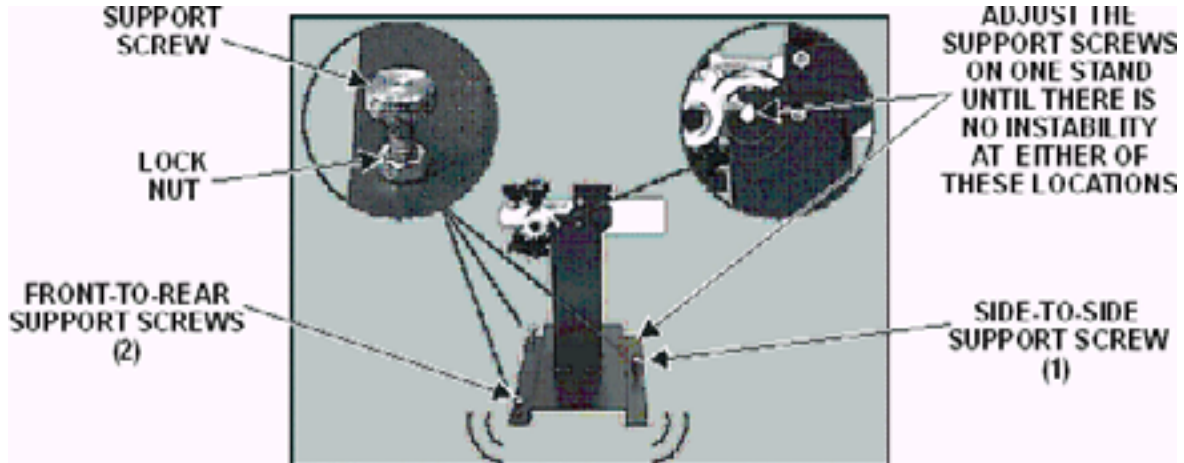
NOTE: Failure to use a stable surface during calibration may result in inaccurate results.

Stabilizing the Calibration Stand

One support screw is located on the inboard side of the stand and two are on the outer side of the stand. See the figure below.

Adjust all the support screws on one stand until they protrude from the bottom of the stand approximately four or five threads. Tighten the lock nuts at each support screw.

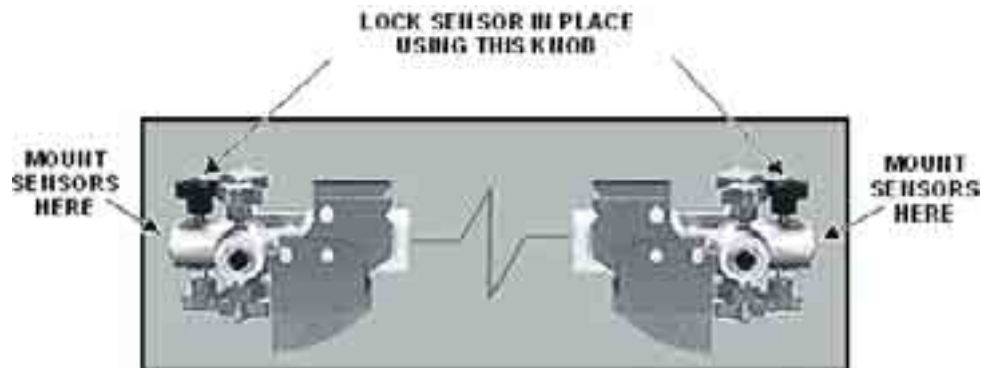
Place the calibration bar on the stands and adjust the support screws on the second stand until there is no movement or rocking of the bar and stands.



NOTE: The calibration stands **MUST NOT** move during calibration.

Mounting the DSP Sensors

Mount the front sensors in the outer end of the calibration bar as shown below.



Level, and then lock the sensors in place using the outermost calibration bar locking knob on top of the calibration bar. The aligner CRT display will show the calibration bar with the appropriate knobs highlighted.

NOTE: The sensor shafts must be fully inserted into the calibration bar. The shoulder of the sensor shaft must contact the flat face end of the calibration bar.

Connect the sensors to the console using the sensor cables.

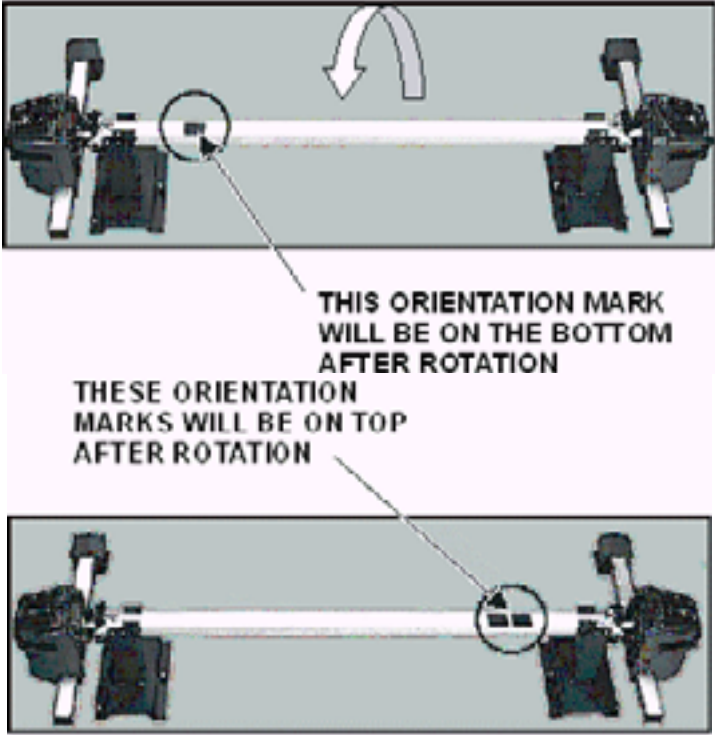
Rotating the Calibration Bar

When prompted to "Rotate bar 180 degrees," remove the sensors from the calibration bar (do **NOT** disconnect power to them). Rotate the bar top-to-bottom as shown below, then remount and secure the sensors using the appropriate calibration bar lock knobs.

The calibration bar has lock knobs on both top and bottom. It is necessary to tighten the knobs on top of the bar only.

The correct starting position of the calibration bar will have the side with the single, black identification mark on the left side, as facing the aligner console.

CAUTION: Do NOT flip the calibration bar end-over-end.



Raising the End of the Calibration Bar (DSP500 Series Sensors)

When you are prompted to raise either end of the calibration bar, do NOT remove the sensors from the bar.

Grasp the indicated end of the calibration bar near the top of the calibration support and lift the bar with the sensors attached. Raise the bar high enough to allow the range bracket to be rotated without hitting the bar.

With your other hand, rotate the range bracket as shown below. Rotate the range bracket until the pins on the range bracket engage with the stand.



Lower the calibration bar and guide the pins in the bar into the v-notches in the top of the range bracket. Lower the bar gently. Dropping the bar onto the support or setting it down hard on the support can cause the sensor to shift position. This will result in inaccurate measurements.

Performing the Zero Calibration

Verify that the appropriate type sensors are selected and “All Sensors,” “All Transducers,” and “Zero Calibration (Long Calibration Bar)” are selected.

When finished verifying selections, press “Calibrate Sensors” to begin the procedure and follow the on-screen instructions.

For additional information and detailed procedural instructions, refer to “Zero Calibration Using the Long Calibration Bar,” Form 4508T.

Reverse Sensor Test

The Reverse Sensor Test is a quick check of the calibration of a set of sensors. This test is applicable to all versions of DSP306, DSP308, DSP506, and DSP508 sensors that have been calibrated using the long calibration bar, 221-652-1.

Begin the test by turning on the sensors and selecting the “Reverse Sensor Test” softkey from the Service Programs screen. The Reverse Sensor Test will be available only if applicable sensors are in use. Follow the on-screen instructions to carry out the test.

Before mounting the sensors on the wheel adapters, rotate the index mark on the sensor shaft to the 12 o’clock position with the sensor held vertical and lock it in place using the sensor lock knob. Do not loosen the sensor lock knobs for the remainder of the test. When instructed to level the sensors do so only by loosening the locking lever or lock knob on the adapter, not the lock knob on the sensor.



When instructed to steer the vehicle, steer as precisely as possible to zero degrees, then use care not to disturb the steering for the remainder of the test.

This test assumes that the vehicle or wheel adaptors do not move during the test procedure. When moving sensors to the opposite axle, detach the sensors from the wheel adaptors, leaving the wheel adaptors mounted to the wheels on which they were originally mounted. Carefully insert the sensors into the wheel adaptors, being careful not to disturb the vehicle or the wheel adaptor.

When the test has been completed, four values will be displayed showing toe and camber differences which will be close to zero. If the Mercedes-Benz account is in use, the values will be shown in green if calibration is OK. If any of the values are shown in red, the sensors need to be calibrated.

Failing to carry out the proper procedures described above and in the on-screen instructions may cause incorrect readings and produce a false indication that calibration is needed.

When the test has been completed, four values will be displayed showing toe and camber differences which will be close to zero if calibration is good. Values that are not close to zero may indicate that the sensors need to be calibrated or that one or more sensors is damaged.

If using “Quick Clamp” adaptors (Figure 1), or using standard self-centering adaptors with offset adaptors, part number 20-1394-1, (Figure 2), the difference values should typically be less than about 0.08° (0°05') because both of these adaptor arrangements provide mounting holes that are tightly fitted to the sensor shaft.

If using self-centering adaptors without offset adaptors (Figure 3), the differences should typically be within 0.16° ($0^{\circ}10'$). Older self-centering adaptors which are somewhat worn or which do not have the newer teardrop-shaped shaft mounting hole may produce differences up to 0.20° to 0.25° ($0^{\circ}12'$ to $0^{\circ}15'$).

Differences which are significantly larger than these indicated ranges for the type of adaptor used may indicate the need for calibration or sensor repair.



Figure 1



Figure 2



Figure 3

Failing to carry out the proper procedures described above and in the on-screen instructions may cause incorrect readings and produce a false indication that calibration or repair is needed.

6.12 DSP400/600 Sensor Calibration

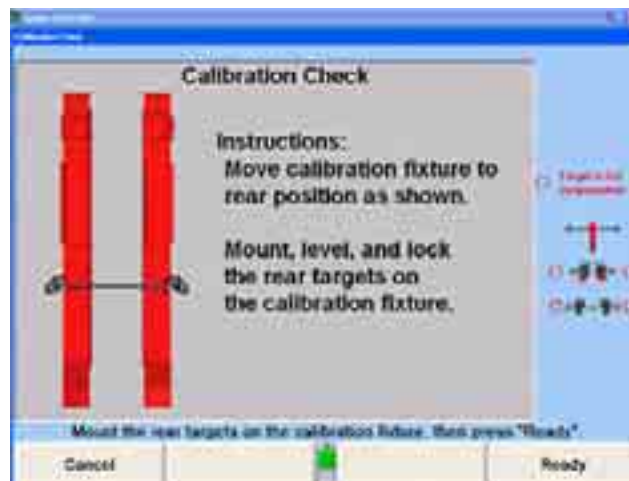
For DSP400/600 Sensor Calibration Instructions refer to Form 4346T, DSP400/600 Series Sensor Calibration Instructions.

For DSP600 Sensor Calibration Instructions refer to Form 4952T, DSP600 Series Sensor Calibration Instructions.

6.13 DSP400/600 Sensor Calibration Check Procedure

After calibrating the Sensors, the following screen appears instructing you to position the calibration bar at the rear of the lift, and to mount, level, and lock the rear targets on the calibration bar (same as during calibration).

For extended L401, L421, RM, and RL lifts, refer to the appropriate lift rack operation instructions, for subsequent cal bar positioning during calibration check procedure.

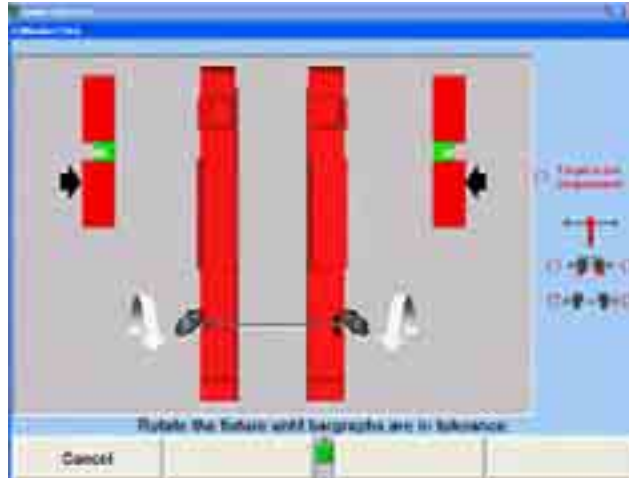


The screen above will appear. If you choose to not check the calibration now, this procedure can be performed any time during the alignment procedure if sensor measurements are questionable.

To check calibration later, the aligner must be reset then go to “Service Programs,” “Calibrate Aligner”, and press “Check Calibration” to begin the procedure.

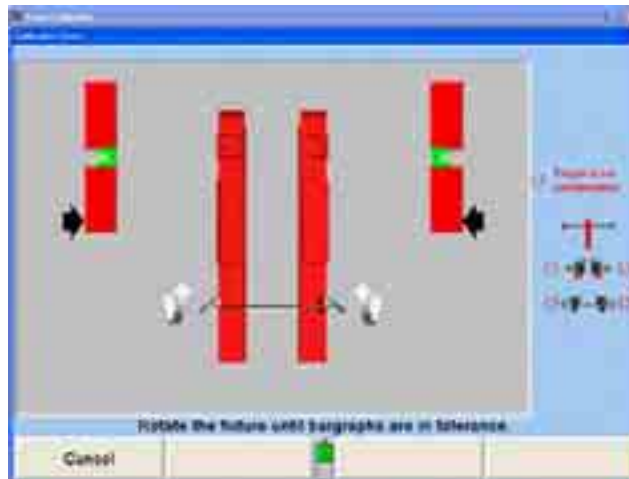
Press "Ready" when you are ready to begin.

Rotate the targets as instructed on the screen.



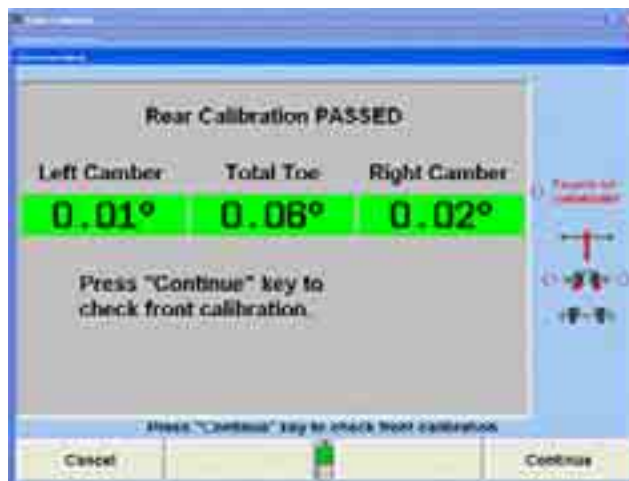
When the readings are stable, the cameras will capture the data and the procedure will advance to the following screen.

Follow the instructions and rotate the targets as directed.

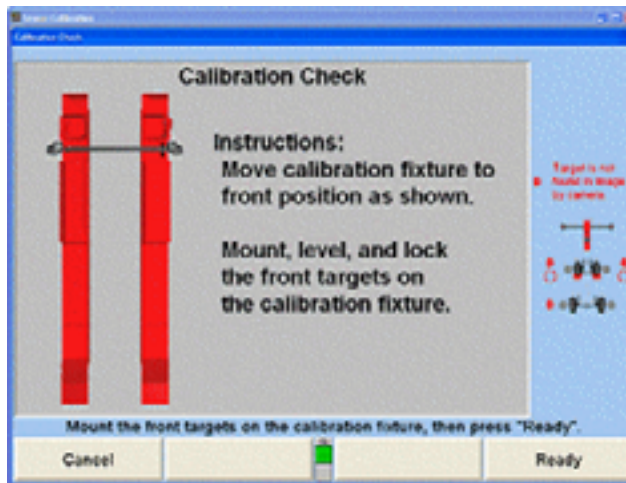


If rear calibration passes, the "Passed" screen appears as below.

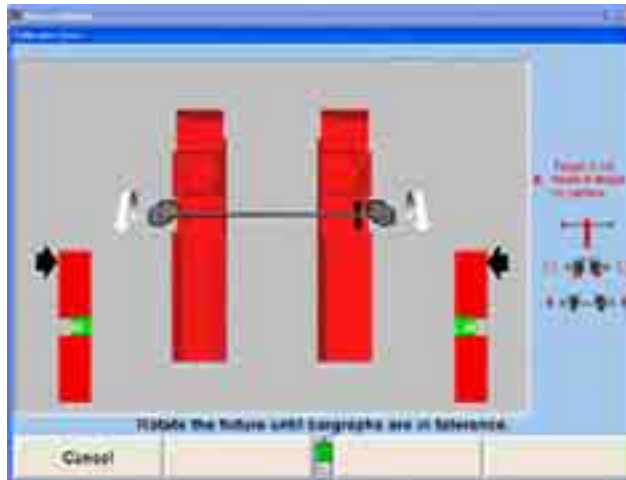
NOTE: With DSP600L sensors the total camber is shown instead of left and right camber.



Press "Continue" and follow the instructions shown on the screen below.

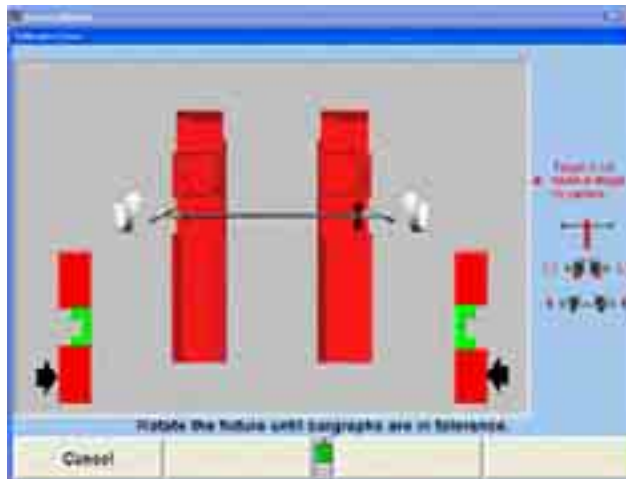


Remove the rear targets and move the calibration bar to the front position. Mount the front targets as directed (same as during calibration). Press "Ready."



When the readings are stable, the cameras will capture the data and the procedure will advance to the next screen.

Follow the instructions and rotate the targets as directed.



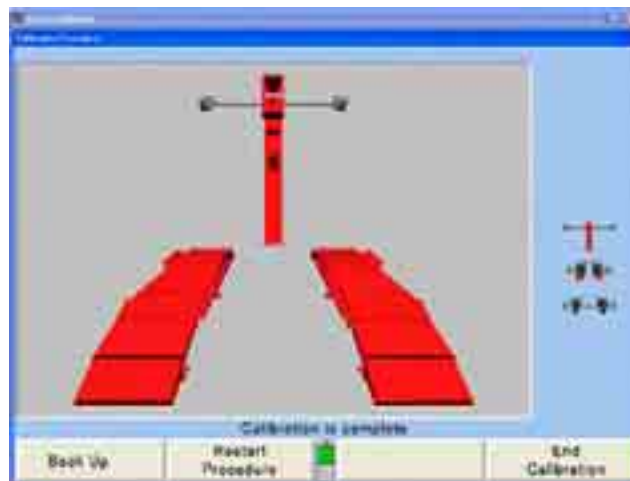
When the readings are stable, the cameras will capture the data and the procedure will advance to the next screen.

If front calibration passes, the “Passed” screen appears as below.

NOTE: With DSP600L sensors the total camber is shown instead of left and right camber.



Press “Ready” as instructed and you will be returned to calibration checking entry screen. Press the “Menu Shift” key to present the next level of softkeys. Press “End Calibration” and restart the alignment procedure.



The calibration procedure is complete. Press “End Calibration.” This returns you to the main calibration screen. Press “End Calibration” again to return to the reset screen.

When the calibration process is complete, do the following:

- Carefully remove the targets from the calibration fixture and remount them on the wheel adaptors.

- Remove the calibration fixture from the rack runway and store in a dry location.

7. Additional Information

7.1 Cradle Adjustment

The construction of passenger vehicles has changed drastically in the last twenty years. Rear wheel driven, full-framed cars, with conventional upper control arm adjustments for front camber and caster are no longer the majority of vehicles being serviced.

The majority of the passenger vehicles on the road today are front wheel driven, unibody vehicles using some form of front strut suspension and often limited to minimal front camber and/or caster adjustments.

Although many aspects of alignment have changed due to the design of the newer vehicles, one of the major issues is the presence of a subframe assembly often referred to as a “cradle.”

Why has the “cradle” become an alignment issue?

Many of the FWD, unibody vehicles are equipped with little, if any, front camber and/or caster adjustments. This lack of adjustment has created a need to find additional methods to adjust alignment angles to within the manufacturer’s specifications.

One of the methods discovered, which may work on some vehicles, is to re-position the cradle assembly forward, rearward or side-to-side. Since the lower control arms attach to the cradle assembly’s frame rails, re-positioning or shifting the cradle assembly will reposition the lower ball joints and change camber and/or caster angles.

Vehicles designed with rear cradle assemblies rely on the cradle to maintain proper control arm position for rear camber, toe, and thrust angle.

Is it possible to reposition a cradle without frame equipment?

Yes, it is possible to reposition the cradle assembly without frame equipment in most cases. Many cradle assemblies have been re-positioned unknowingly by technicians performing service procedures such as transaxle repair and engine removal.

Bolting a cradle assembly to the body of the vehicle seems simple, but without the knowledge of how the cradle assembly position can affect alignment angles, it is easy to position the lower control arms far enough away from their intended position to cause alignment angles to be out of specification.

A basic understanding of the interaction between the cradle assembly and the alignment angles will provide the alignment technician with the knowledge to check the cradle position and reposition it when needed.

What are the procedures for properly positioning a cradle assembly?

The procedures differ from manufacturer to manufacturer, however the concept behind shifting the cradle assembly and the affect it has on alignment angles, tire wear, suspension components, driveline components and steering components remains constant throughout the industry.

▲ WARNING: The important fact to remember is the cradle assembly has one, and only one correct position, which is generally determined by alignment holes between the cradle assembly and the body of the vehicle.

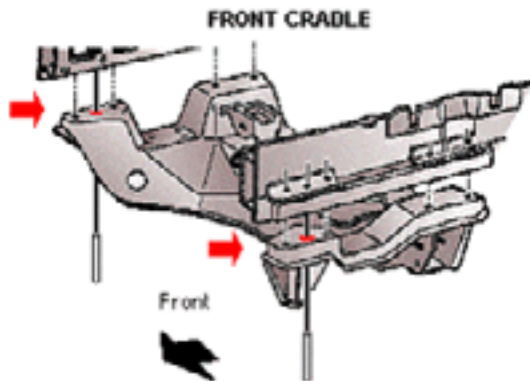
▲ WARNING: The information contained in this section is not intended to be a substitute for the vehicle manufacturer's service information regarding the cradle assembly.

Definition of Cradle

The term "cradle" is often used to describe a subframe constructed of two side frame rails with transverse supporting cross members. The frame rails and cross members may be welded or bolted together and are attached as an assembly to the unibody structure with bolts and insulating bushings. This assembly forms a cradle for the driveline and the engine.

Why are cradle assemblies used?

The cradle assembly serves as a mounting platform for the entire driveline assembly and the lower control arms of the suspension on front or rear driven vehicles equipped with transverse mounted engines. A considerable savings in both time and money is realized utilizing this design, since the engine, transmission, differential, and lower suspension components can be assembled and installed as a unit.



What is the proper position for the cradle?

In general, the position of the cradle in respect to the unibody must be at a location that provides proper driveline, suspension, and steering alignment. The exact position of the cradle assembly is normally documented in the manufacturer's service manual.

What happens if the cradle is out of position?

It is possible, however, for the cradle assembly to be secured in a position that is slightly off to one side or slightly forward or rearward of the intended position. This is due to the enlarged frame holes in the cradle rails.

Over-sizing of the frame holes is needed to simplify the attachment of the cradle assembly to the body of the vehicle. Unfortunately, this over-sizing also may allow the cradle to be positioned incorrectly with the body of the vehicle.

An improperly positioned front cradle assembly can affect camber caster setback and S.A.I./IA. The result may be:

- insufficient adjustment range
- premature tire wear
- vehicle instability
- improper drive line angles

In addition, since the upper suspension components (i.e. struts, stabilizer bar frame bushings, etc.), steering gear and upper engine mount are attached to the body, an incorrect position of the cradle assembly to the body may produce undesired stress on suspension and steering components.

An improperly positioned rear cradle may affect rear camber, toe and thrust angle. This may result in undesired “dog-tracking” and premature tire wear.

Vehicles with Adjustable Cradles by Manufacturer

The following list represents the majority of vehicle models having a unibody construction with moveable front frame rails, often called a “cradle assembly.”

Front Adjustable Cradles

Buick

- Century (86-02)
- Electra / Park Avenue (85-90)
- LeSabre (86-99)
- Park Avenue / Ultra (91-02)
- Reatta (88-91)
- Regal (88-02)
- Rendezvous 4x2 and 4x4 (02)
- Riviera (86-99)

Cadillac

- Allante' (87-93)
- DeVille incl. Concours (85-99)
- Eldorado (87-02)
- Fleetwood / Sixty Special FWD (88-93)
- Seville (87-02)

Chevrolet

- Celebrity (86-90)
- Lumina (90-01)
- Lumina APV (90-96)
- Monte Carlo (95-99)
- Venture 4x2 and 4x4 (97-02)

Chrysler

Cirrus (95-00)
Sebring Convertible (96-00)

Dodge

Stratus (95-00)

Ford

Taurus Sedan and Wagon (86-99)
Thunderbird (89-97)
Windstar (99-02)

Lincoln-Mercury

Continental (88-94)
Mark VIII (93-98)
Cougar (89-97)
Sable Sedan and Wagon (86-99)

Oldsmobile

Aurora (95-99)
Cutlass Ciera (86-96)
Cutlass Cruiser (86-96)
Cutlass Supreme-all models (88-97)
Delta 88 (86-87)
Eighty Eight (incl. LSS) (88-99)
Intrigue (98-02)
Ninety Eight (85-96)
Regency (97-98)
Silhouette (90-02)
Toronado (86-92)

Plymouth

Breeze (96-00)
6000 incl. AWD (86-91)
Aztek 4x2 and 4x4 (01-02)

Pontiac

Bonneville (87-99)
Grand Prix (88-02)
Montana 4x2 and 4x4 (98-02)
Trans Sport (90-98)

Saturn

S-Series (SL/SC/SW) (91-02)

Vehicles with Adjustable Rear Cradles

Ford Thunderbird (89-97)
Mercury Cougar (89-97)

Always refer to the manufacturer's service information prior to attempting a change in cradle position. Each model requires a specific alignment technique unique to its cradle-to-body design.

Camber and Steering Axis Inclination (S.A.I.) Angles

The position of the cradle assembly may be incorrect due to collision, improper mounting bolt torque or incorrect placement after having been removed during engine or transaxle repair.

Inspect the cradle rails and cross members for damage. Bent or damaged cradle assembly components are good indicators that the cradle may have moved.

The inability to adjust camber to preferred specification on either side of the vehicle is another sign that the cradle may be out of position. S.A.I. measurements are also quite helpful in determining cradle position.

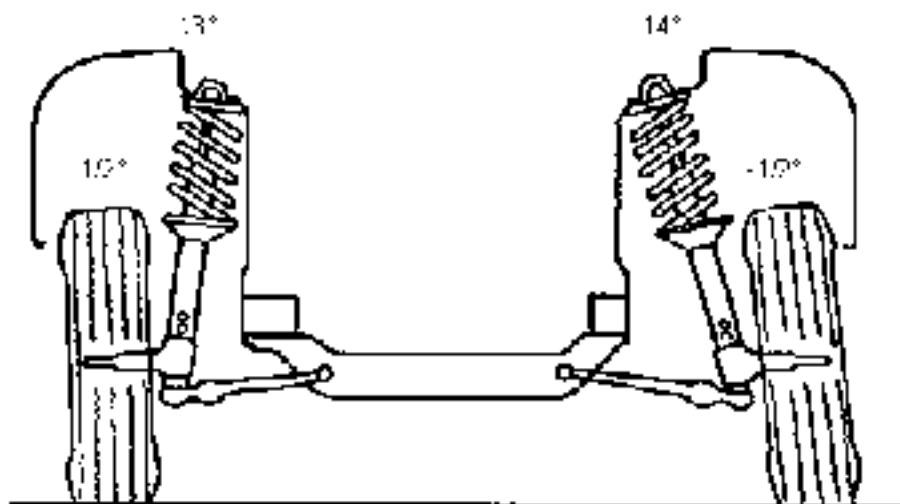
How does the cradle position effect camber and S.A.I.?

Since the front cradle assembly controls the lower control arm position, incorrect placement side-to-side will affect front camber and Steering Axis Inclination (S.A.I.).

When the cradle assembly is moved sideways, one lower control arm is moved outward decreasing camber and increasing S.A.I. The other lower control arm moves inward increasing camber and decreasing S.A.I.

An incorrect side-to-side position of the rear cradle assembly will affect rear camber in the same manner.

The following example may clarify what occurs when the cradle assembly shifts to one side or the other.



EXAMPLE:

left camber = $+1/2^\circ$

right camber = $-1/2^\circ$

left SAI = 13°

right SAI = 14°

desired camber = 0°

Shifting the cradle to the positive camber side would equalize camber and SAI.

The example above illustrates a combination of camber and S.A.I., which may indicate the need for repositioning or “shifting” of the cradle assembly. The cradle position should be checked using the manufacturer’s centering instructions. In this example, moving the cradle assembly to the positive camber side will reduce the difference in camber and S.A.I.

What are the affects of an improperly positioned cradle?

Although it is true that “shifting” a cradle often times brings “factory non-adjustable” or “out-of-adjustment” alignment angles closer to preferred specification, the side affects may be undesirable.

Shifting a cradle assembly away from proper alignment with the body, for the sake of reducing camber and S.A.I. difference, may result in unwanted torque steer, bump steer or damage to drive shaft assemblies.

Vehicle manufacturers specify the correct procedure for insuring a proper alignment of the cradle assembly to the body of the vehicle. Most of these vehicles have alignment holes in the cradle assembly and body of the vehicle, which require the use of an alignment dowel or similar device to establish the precise location of the cradle assembly.



WARNING: Variance from the manufacturer’s procedure is an assumed liability and should not be taken lightly, as the results may be costly and dangerous.

Caster and Setback Angles

The existing position of the cradle assembly may be incorrect due to collision, improper mounting bolt torque, or incorrect placement after being removed for engine or transaxle repair.

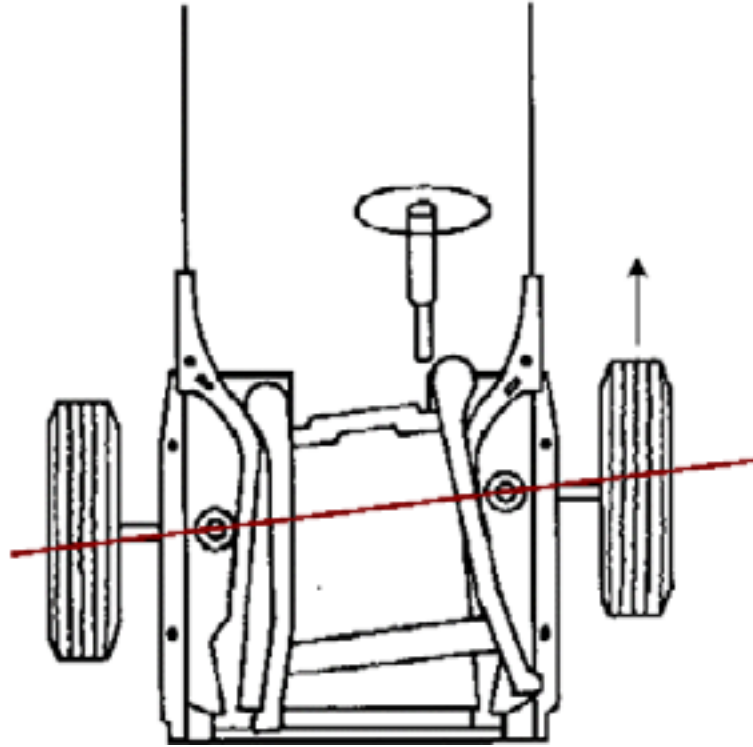
Inspect the cradle rails, lower control arms, and cross members for damage or signs of collision. Bent or damaged cradle assembly components are good indicators that the cradle may have moved.

Check the torque of the cradle mounting bolts and adjust as needed using the manufacturer’s torque specification and procedure. Improperly torqued mounting bolts may allow the cradle to reposition itself during acceleration and braking.

The inability to adjust caster to preferred specification on either side of the vehicle is a sign that the cradle may be out of proper position. Another good indicator is when a significant amount of setback accompanies a low caster reading.

How does the cradle position effect caster and setback angles?

Since the front cradle assembly controls the lower control arm position, incorrect placement corner-to-corner affects front caster and setback angles. When the cradle assembly is moved forward on one side and rearward on the other side, one lower control arm is moved rearward decreasing caster and increasing setback. The other lower control arm moves forward increasing caster and increasing setback.



An incorrect corner-to-corner position of the rear cradle assembly will affect rear individual toe and thrust angle.

The following example may clarify what occurs when the cradle shifts forward on one side and rearward on the other side.

EXAMPLE:

left caster = 2°

right caster = 4°

setback = - 0.80

desired caster = 3°

The cradle has shifted rearward to the left causing the left lower control arm to move rearward and decreasing left caster. This also increased negative setback.

The cradle moved forward on the right side causing the right lower control arm to move forward and increasing caster. This also increased negative setback.

The example above illustrates a combination of caster and setback, which may indicate the need for repositioning or “shifting” of the cradle assembly.

Shifting the cradle to a centered position would reduce setback and reduce the difference in left and right caster bringing them closer to preferred specification. The cradle assembly should be checked for proper positioning using the manufacturer’s centering instructions.

7.2 Ride Height Specifications

Ride height specifications are determined by the height of the vehicle to a point specified by the manufacturer within specific tolerances.

Damage to vehicle suspension and a poor alignment can be caused when ride height is not within the manufacturer's specifications.

Toe Change

Front toe can change to an extreme toe-in or toe-out condition, depending on the location of the steering arms, when the steering linkage is forced into a downward operating position from sagging front coil springs. The result is heavy tire wear and poor handling characteristics.

Camber (Side-Slip)

A small amount of sag in the springs will increase lateral movement of the wheels, causing tires to slide laterally across the pavement. The result is extreme tire wear.

Shocks and Struts

Sagging springs will shorten the shock absorber causing the frame to be closer to the rubber strike out bumper. The result is the car will "bottom out."

Rear Springs

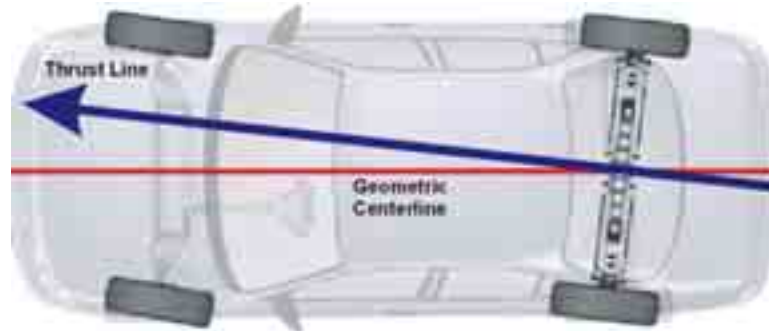
Caster and camber suffer the most when the rear springs are sagging. The result is poor handling and tire wear.

8. Glossary

8.1 Alignment Types

The basic alignment types are: Geometric Centerline Alignment, Thrustline Alignment, and Total Four-Wheel Alignment. The term “Front Wheel Alignment” is no longer accurate to describe any modern alignment type.

Geometric Centerline Alignment



Toe on each front wheel is measured and adjusted using the geometric centerline of the vehicle as a reference.

Geometric centerline alignment has been used for many years and may provide a satisfactory alignment if the rear wheels are positioned squarely with the geometric centerline of the vehicle.

However, if the rear wheels of the vehicle (either solid axle or independent suspension) create a thrust line that is not parallel to the geometric centerline, the steering wheel position may not be centered properly as the vehicle moves in a straight direction.

Thrust Line Alignment

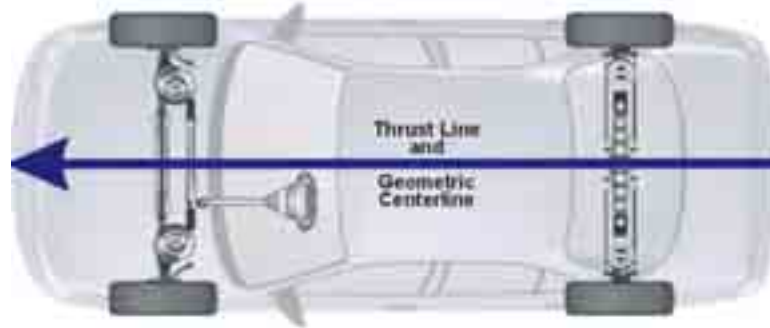


Aligning the front wheels to the thrust line of a vehicle is a significant improvement over aligning to the geometric centerline.

In the thrust line method, rear individual toe is measured (but not adjusted). The thrust line created by the rear wheels is used as a reference for aligning the front wheels.

As a result, the operator is assured of a straight steering wheel as the vehicle moves straight ahead.

Total Four-Wheel Alignment



Total four-wheel alignment is the ultimate wheel alignment service. Rear individual toe is measured, then adjusted to the factory specifications. If adjusted correctly, the thrust line of the rear wheels becomes parallel to the geometric centerline of the vehicle.

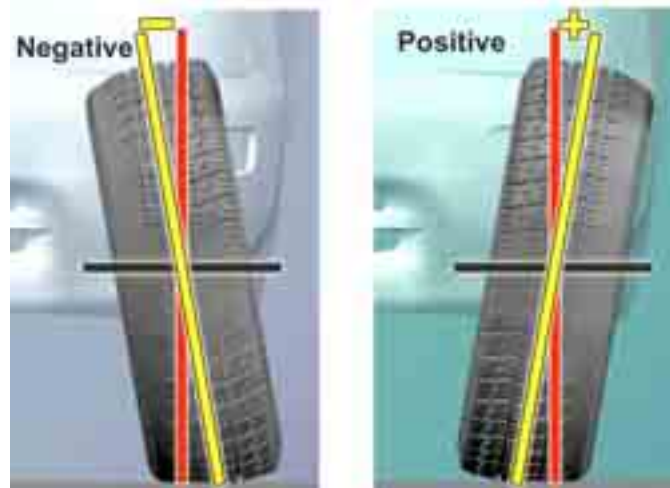
The front wheels are then aligned to the rear wheel thrust line.

Total four-wheel alignment provides the ability to correct a dog-tracking condition and assures a straight steering wheel as the vehicle moves in a straight line.

8.2 Alignment Angles and Measurements

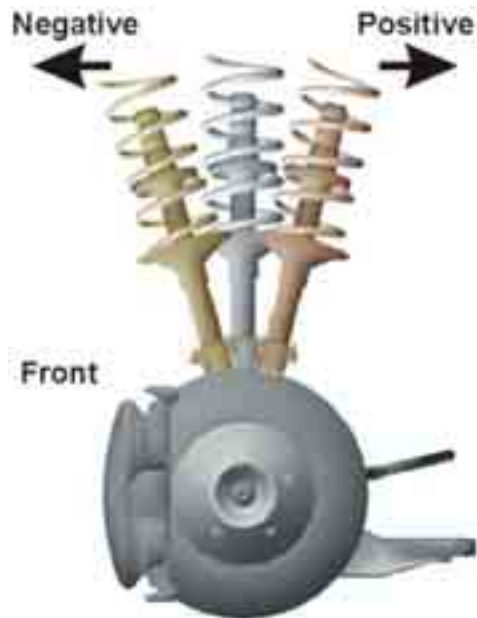
This section provides definitions to terms used in the manual.

Camber



The angle formed by the inward or outward tilt of the top of the wheel, referenced to a vertical line as viewed from the front. This angle is measured and displayed in degrees. Camber is positive when the wheel is tilted outward at the top and is negative when the wheel is tilted inward at the top.

Caster



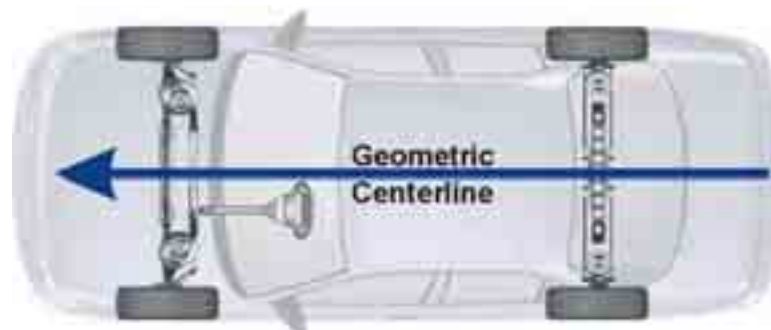
The forward or rearward tilt of the steering axis in reference to a vertical line as viewed from the side. This angle is measured and displayed in degrees. Caster is positive when the top of the steering axis is tilted rearward and is negative when the top of the steering axis is tilted forward.

Frame Angle



The angle (from a side view) formed by a horizontal line and a line drawn parallel to the frame. Frame angle is positive when the frame is higher at the rear and is negative when the frame is lower at the rear. The aligner does NOT calculate frame angle.

Geometric Centerline



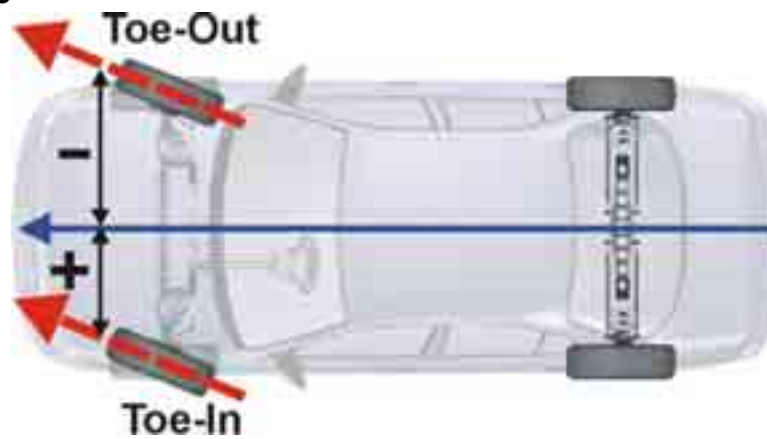
This is a line drawn through the midpoint of the front and rear axle.

Included Angle (I.A.)



The sum of S.A.I. and camber.

Individual Toe



The angle formed by a horizontal line drawn through a plane of one wheel referenced to the reference line of the vehicle. Individual toe is measured in degrees but may be displayed in degrees, inches or millimeters. Toe-in is when the horizontal lines intersect in front of the wheel. Toe-out is when the horizontal lines intersect behind the wheel.

Ride Height



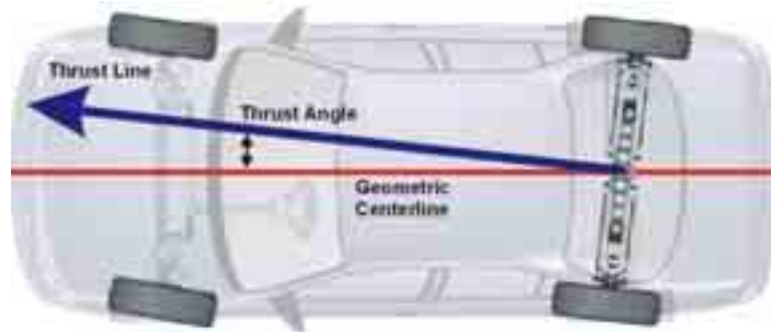
The height of the vehicle to a point specified by the manufacturer within specific tolerances.

Steering Axis Inclination (S.A.I.)



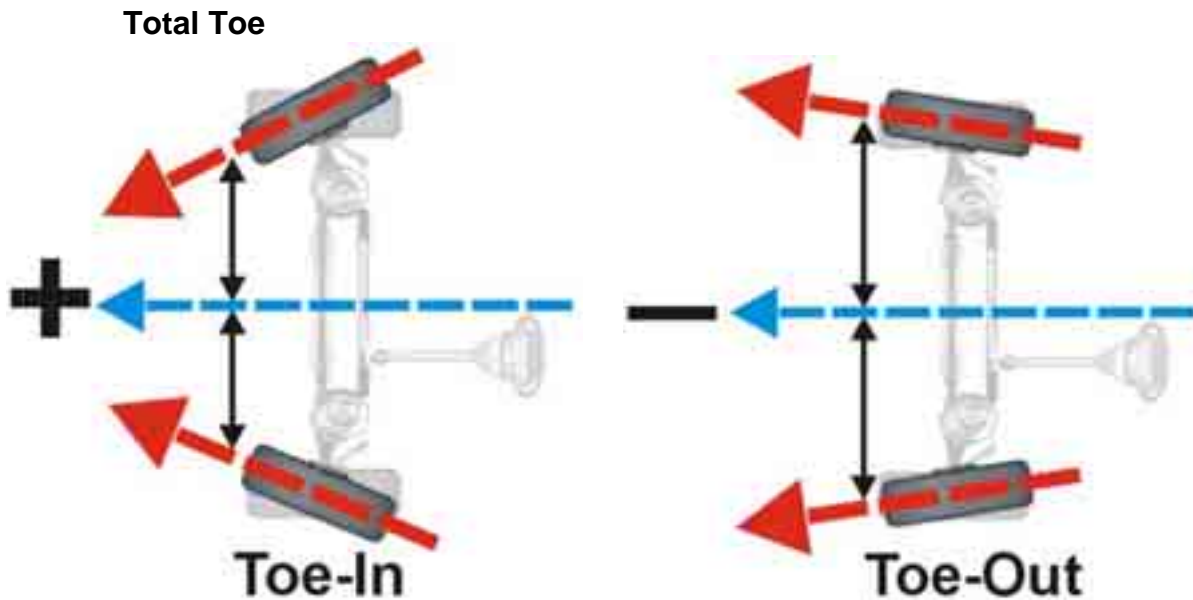
The angle formed by a line drawn through the upper and lower pivot points of the steering axis and a vertical line as viewed from the front. S.A.I. is measured and displayed in degrees.

Thrust Angle and Thrust Line



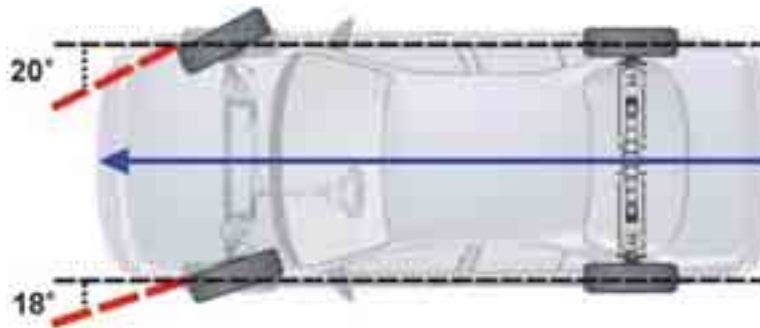
The angle formed by the geometric centerline and the thrust line of an axle is the Thrust Angle. This angle is measured and displayed in degrees.

The bisector of total toe angle of the axle is the Thrust Line.



The angle formed by two horizontal lines drawn through the planes of two wheels on the same axle. Total toe is measured in degrees but may be displayed in degrees, inches or millimeters. Toe-in is when the horizontal lines intersect in front of the wheels. Toe-out is when the horizontal lines intersect behind the wheels.

Turning Angle



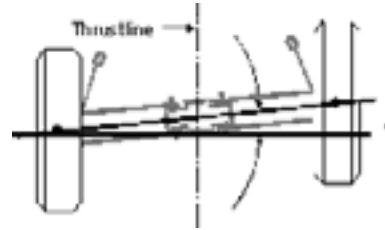
The difference in the angles of the front wheels in a turn.

Symmetry Angle/Set Back Definitions

NOTE: The names of these angles imply that fixed geometric positions are being determined. However, the definitions shown below indicate that their names can be misleading, and that the measurements can be affected by alignment conditions other than what their names would imply. *For more information on alignment angles refer to the Glossary section at the end of this document.*

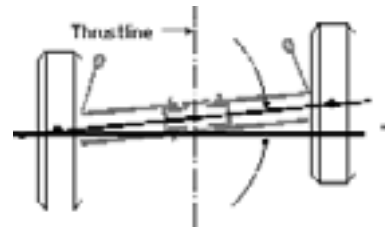
Front Set Back

Front Set Back is an angle formed by a line drawn perpendicular to the thrustline and a line connecting the centers of the front wheels. Front Set Back is positive when the right front wheel is behind the left front wheel. Front Set Back is negative when the right front wheel is ahead of the left front wheel. Front Set Back is measured as an angle, but can be displayed in inches or millimeters if front tread width is available in the vehicle specification data.



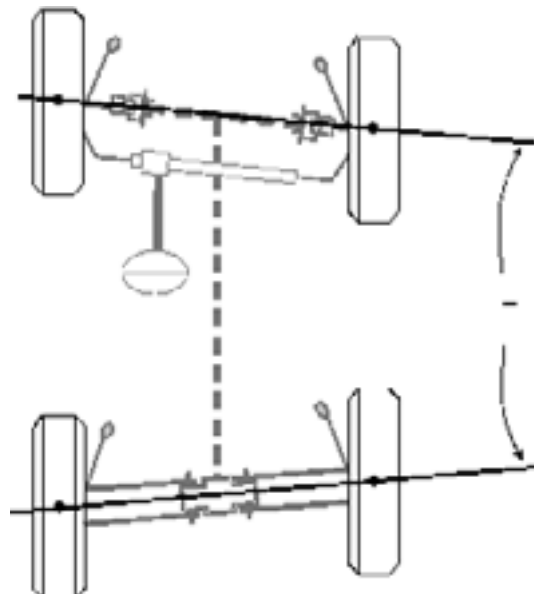
Rear Set Back

Rear set back is an angle formed by a line drawn perpendicular to the thrustline and a line connecting the centers of the rear wheels. Rear Set Back is positive when the right rear wheel is behind the left rear wheel. Rear Set Back is negative when the right rear wheel is ahead of the left rear wheel. Rear Set Back is measured as an angle, but can be displayed in inches or millimeters if rear tread width is available in the vehicle specification data.



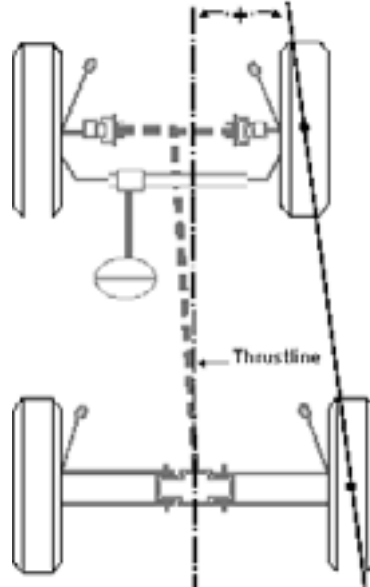
Wheelbase Difference

Wheelbase difference is an angle formed by a line connecting the centers of the front wheels and a line connecting the centers of the rear wheels. Positive wheelbase difference indicates that the right wheelbase is longer than the left wheelbase. Negative wheelbase difference indicates that the left wheelbase is longer than the right wheelbase. Wheelbase difference is measured as an angle, but can be displayed in inches or millimeters if the track width is available in the vehicle specification data.



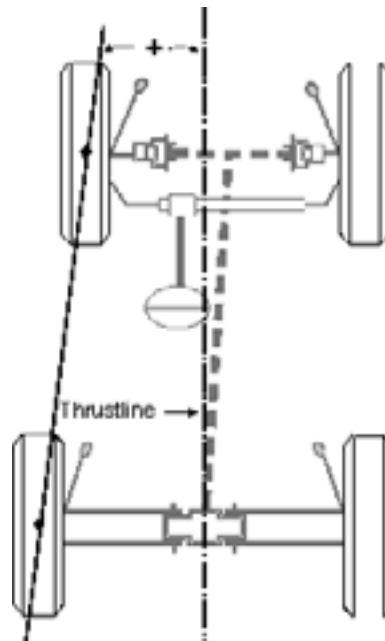
Right Lateral Offset

Right lateral offset is an angle formed by the thrustline and the line connecting the centers of the right front and right rear wheels. Right lateral offset is positive when the right rear wheel is offset to the outside when compared to the right front wheel. Right lateral offset is negative when the right front wheel is offset to the outside when compared to the right rear wheel. Right lateral offset is measured as an angle, but can be displayed in inches or millimeters if the wheelbase is available in the vehicle specification database.



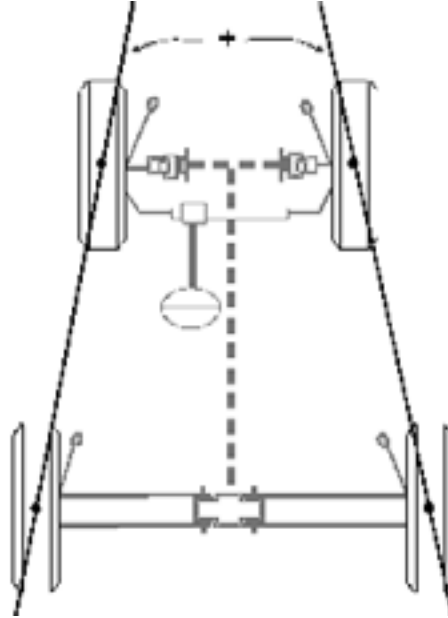
Left Lateral Offset

Left lateral offset is an angle formed by the thrustline and the line connecting the centers of the left front and left rear wheels. Left lateral offset is positive when the left rear wheel is offset to the outside when compared to the left front wheel. Left lateral offset is negative when the left front wheel is offset to the outside when compared to the left rear wheel. Left lateral offset is measured as an angle, but can be displayed in inches or millimeters if the wheelbase is available in the vehicle specification database.



Track Width Difference

Track width difference is an angle formed by the line connecting the centers of the rear right and front right wheels and the line connecting the centers of the rear left and front left wheels. Track width difference is positive when the rear track width is larger than front track width. Track width difference is negative when the front track width is larger than the rear track width. Track width difference is measured as an angle, but can be displayed in inches or millimeters if the wheelbase is available in the vehicle specification database.



Axle Offset

Axle offset is an angle formed by the line, which bisects the track width difference angle, and the thrust line. Axle offset is positive when the rear axle is offset to the right. Axle offset is negative if the rear axle is offset to the left. Axle offset is measured as an angle, but can be displayed in inches or millimeters if the wheelbase is available in the vehicle specification data.

