HUNTER Engineering Company

HUNTER 3 Year Warranty hunter.com/warranty

MADE IN USA
USING THE FINEST US & GLOBAL MATERIALS

ROAD FORCE ELITE®

The world's fastest diagnostic balancer

OPERATIONS MANUAL

Operations Manual

Standard Operation Video

Form: BM08068-00
06/21/2024
Supersedes 11-22

Table of Contents

1. Owner Information Form - Balancers 4
2. Getting Started 5
    2.1. Corporate Information 5
    2.2. For Your Safety 5
        2.2.1. Hazard Definitions 5
        2.2.2. Important Safety Instructions - Electrical 5
        2.2.3. Important Safety Instructions - Operation 6
    2.3. Decal Information and Placement 6
    2.4. Specific Precautions 8
    2.5. Turning Power On/Off 10
    2.6. Equipment Specifications 11
        2.6.1. Explanation of Symbols 11
    2.7. Main Screen Components 12
    2.8. Road Force Elite GSP9700 Components 13
3. Operating the Balancer 14
4. Balancing Procedures 17
    4.1. Wheel Lift Operation 17
    4.2. CenterChecking® Wheel Centering Feature 17
    4.3. Front / Back Collet Mounting 18
    4.4. Specialized Mounting Conditions 19
    4.5. Wheel Assembly Selection for Saving Spin Data 21
    4.6. Balance Modes 22
    4.7. Inflation Station 24
    4.8. Quick-Thread® Wheel Clamping 25
    4.9. Motor Drive/Servo-Stop, Spindle-Lok®, and Safety Hood 25
    4.10. Balancing Procedures for Specific Weight Types and Placement using TruWeight® 26
        4.10.1. Balancing Procedure Using Clip-On Weights 27
        4.10.2. Balancing Procedure Using a Combo of Clip-On & Adhesive (Tape) Weights (Mixed Weights) 29
        4.10.3. Balancing Procedure Using Adhesive (Tape) Weights 31
    4.11. Rim Dimension Manual Entry 32
    4.12. Blinding and Rounding 34
    4.13. Tape Weight Menu & Split Spoke Feature 34
    4.14. Optional HammerHead® TDC Laser Clip-On Weight Locator 35
    4.15. TPMSpecs™ Feature & Hunter Help 35
5. SmartWeight® Balancing 38
    5.1. SmartWeight® Balancing Technology 38
    5.2. Dynamic Weight Planes 38
    5.3. Using SmartWeight® Balancing Technology 39
        5.3.1. Switching from SmartWeight® Balancing to Traditional Dynamic Balancing 40
        5.3.2. Switching from Traditional Dynamic Balancing to Traditional Static Balancing 40
6. Road Force Measurement® Procedures 42
    6.1. Load Roller Operation 42
    6.2. Forcematching® 42
        6.2.1. Match Codes 44
        6.2.2. Encountering ForceMatch® Prediction Errors 46
        6.2.3. Do's and Don'ts of Road Force Measurement 47
        6.2.4. Road Force® Savings 47
    6.3. StraightTrak Lateral Force Measurement (LFM) 47
        6.3.1. Disabling StraightTrak® 49
        6.3.2. Interpreting the Tire Stack 50
        6.3.3. Net Tire Pull 51
        6.3.4. Printout 53
        6.3.5. Inflation Pressure & Extra Info 54
    6.4. Individual Lateral Force Measurement 55
        6.4.1. Road Force Savings 56
7. Optional Balancer Procedures 57
    7.1. Tools 57
8. Maintenance 59
    8.1. Calibration Procedures 59
    8.2. Cleaning the Console 59

8.3. Cleaning and Lubricating the Adjustable Flange Plate and Pin 60
8.4. Maintenance Schedule 61
9. Warranty Information 63

1. Owner Information Form - Balancers

Customer Name: _____ Installation Date: _____

Model Number: _____ Serial Number: _____

Order Number:_____ Software Number: _____

Sales Representative Name and Number: _____

Sales Representative Phone: _____

Service and Parts Representative Name & Number: _____

Service and Parts Representative Phone: _____

Hunter Wheel Balancer - Equipment Training Report

Technicians Trained: *Please Print*

Technician 1: _____ Technician 2: _____

Technician 3: _____ Technician 4: _____

Please have trained technicians initial each training item:

Balancer Training Task	Tech 1	Tech 2	Tech 3	Tech 4
Safety Precautions, Power On/Off Procedures	_____	_____	_____	_____
Overview of Display, Dataset Arms, Spindle Pedal and Wheel Lift	_____	_____	_____	_____
Inflation Station and Bar Code Operation (if applicable)	_____	_____	_____	_____
Mounting Methods (Front-Cone, Back-Cone, Flange Plate)	_____	_____	_____	_____
Clamping (Quick Thread/Auto Clamp) Operation	_____	_____	_____	_____
Centering Check Procedures	_____	_____	_____	_____
Balance Mode Selection (Balance Only, Road Force, Straight Trak)	_____	_____	_____	_____
Weight Location Entry (Clip-Clip, Clip-Tape, Tape-Tape, Split-Spoke)	_____	_____	_____	_____
Installation of Wheel Weights (Servo-stop, Hammerhead, BDC Laser)	_____	_____	_____	_____
Recalling TPMS Reset Procedures	_____	_____	_____	_____
Performing a Balancer Calibration/Calibration Check	_____	_____	_____	_____
Rim Runout Measurement (Rim with Tire, Bare Rim)	_____	_____	_____	_____
Match Mounting	_____	_____	_____	_____
Tire Stack Operation	_____	_____	_____	_____
Printout Selection	_____	_____	_____	_____

Installation & Training Acknowledgement: I, the undersigned, do hereby acknowledge that my Hunter Engineering Wheel Balancer has been installed & is operational. I also acknowledge that the above technicians have been trained to my satisfaction in those areas of safety & operation as indicated above.

Management Name (print): _____ Date: _____

Management Signature: _____

2. Getting Started

This manual provides operation instructions and information required to operate the Road Force® Elite GSP9700 Balancer. Read and become familiar with the contents of this manual prior to operating the Road Force® Elite GSP9700 Balancer.

The owner of the Road Force® Elite GSP9700 Balancer is solely responsible for arranging technical training. The Road Force® Elite GSP9700 Balancer is to be operated only by qualified trained technicians. Maintaining records of personnel trained is solely the responsibility of the owner and management. This manual assumes the technician has already been trained in basic balancing procedures.

2.1. Corporate Information

Hunter Engineering Company

Addr:	11250 Hunter Drive, Bridgeton, MO 63044 USA
Ph:	314-731-3020
Web:	*www.hunter.com*

2.2. For Your Safety

2.2.1. Hazard Definitions

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, which will result in severe personal injury or death.

These symbols identify situations that could be detrimental to your safety and or cause equipment damage.

2.2.2. Important Safety Instructions - Electrical

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

If an extension cord is necessary, it must have a current rating equal to or more than that of the equipment. Cords rated for less may overheat. Arrange the cord so that it will not be tripped over or pulled.

Never use the cord to pull the plug from the outlet. Do not let cord hang over any edge or contact fan blades or hot manifolds.

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

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.

When servicing the , power must be disconnected by removing the power cord from the electrical outlet. Ensure that the power switch is in the off position ("O" position) before plugging the power cord into the electrical power outlet.

2.2.3. Important Safety Instructions - Operation

To reduce the risk of fire, do not operate equipment near open containers of flammable liquids (gasoline). 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 equipment. Keep all instructions permanently with the unit. Keep all decals, labels, and notices clean and visible. To prevent accidents and/or damage to the recommended accessories.

Use equipment only as described in this manual. Never stand on the . Wear non-slip safety footwear when operating the . Keep hair, loose clothing, neckties, jewelry, fingers, and all parts of body away from all moving parts. ALWAYS WEAR OSHA APPROVED SAFETY GLASSES. Eyeglasses that have only impact resistant lenses are NOT safety glasses. Adequate ventilation should be provided when working on operating internal combustion engines.

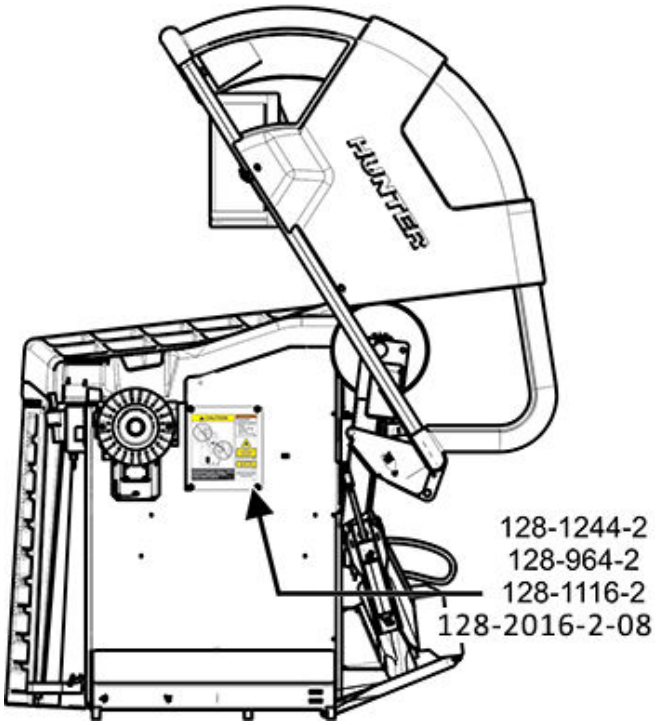
2.3. Decal Information and Placement

RIGHT SIDE VIEW

Decal **128-1244-2** cautions the operator that spindle rotation may occur with foot pedal depression and to keep clear of clamping components during Quick-Thread® shaft rotation.

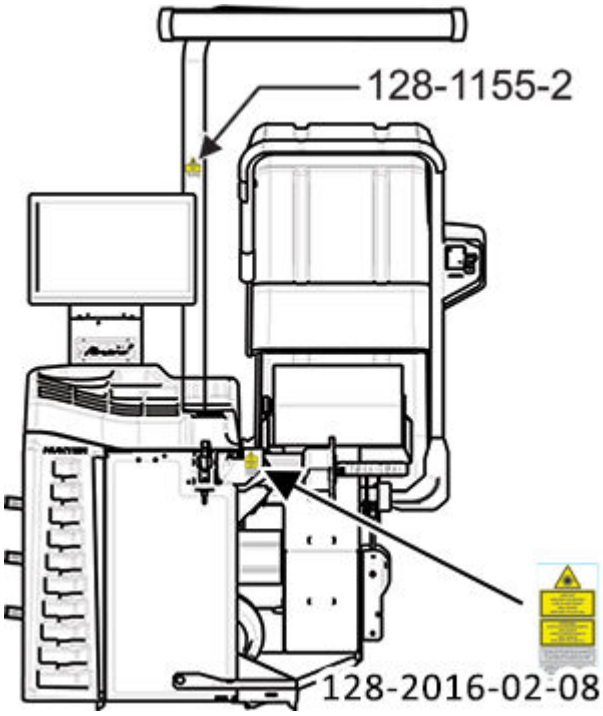
Decal **128-964-2** gives the maximum wheel diameter and maximum wheel weight for the Road Force® Elite GSP9700.

EN/IEC Class 3R Laser Product Certification is shown on Decal **128-2016-02-08**. This labels shows the EN/IEC standards for a Class 3R Laser Product. An explanation of FDA compliance standards is shown on Decal **128-2016-02-08**. FDA performance standards compliance is shown on the decal.



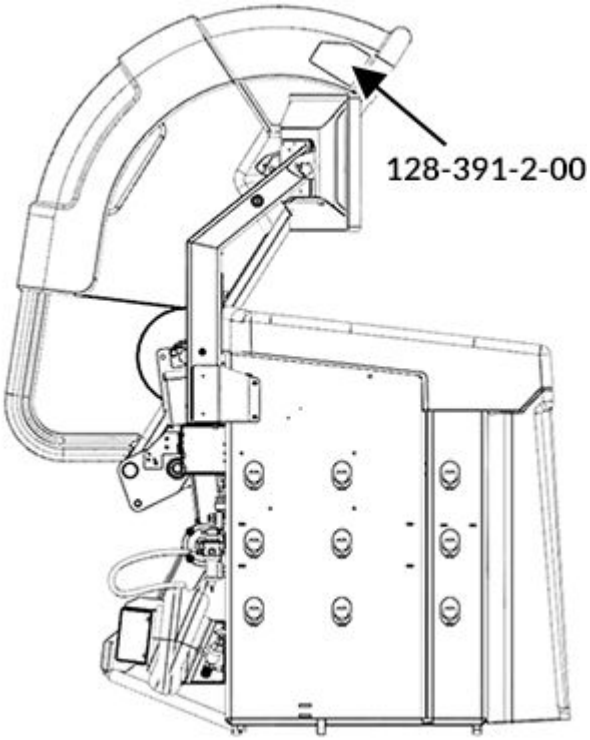
FRONT VIEW

FDA standards for Class 2M laser compliance are shown on Decal 128-1155-2 (for TDC Units). FDA Standards for Class 3R compliance are shown on Decal 128-2016-02-08.



LEFT SIDE VIEW

Decal 128-391-2-00 cautions that the unit may automatically start upon closing of the hood when Hood Autostart is enabled.

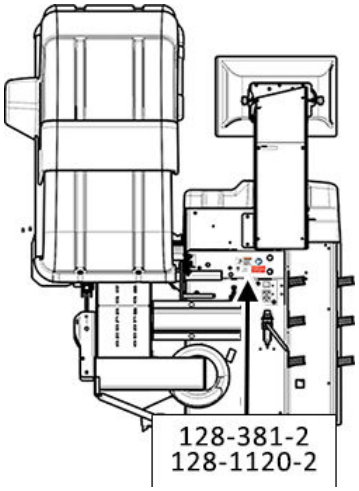


The Class 2M laser apertures are located at either end of the TDC header.

BACK VIEW

Decal **128-381-2** warns the operator not to remove the cover of the Road Force Elite / GSP9700 because of the risk of electrical shock and not to use below garage floor level.

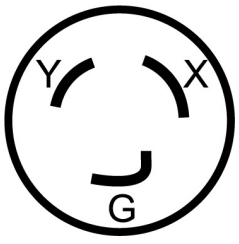
ETL certification standards are outlined on Decal **128-1120-2**. Additionally, users are cautioned not to use the balancer below garage floor level.



2.4. Specific Precautions

POWER SOURCE

The Road Force® Elite GSP9700 Balancer is intended to operate from a power source that will apply 230VAC +10% / -15%, 1 phase, 10 amp 50/60 Hz, power cable includes NEMA 20 amp plug, L6-20P, between the supply conductors of the power cord. The power cord supplied utilizes a twist lock connector, NEMA L6-20P. This machine must be connected to a 20 amp branch circuit. Please refer all power source issues to a certified electrician.



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.

NOTICE
For information on converting from single phase NEMA L6-20P plug to thee phase NEMA L1520P plug refer to Form *5350-T*, “NEMA L6-20P to NEMA L15-20P Power Plug Conversion Instructions.”

OPTICAL SCAN LASER

The Optical Scan Laser is a Class 3R laser designed to measure the profile of wheel assemblies. The laser is not a field serviceable part. No maintenance is to be performed on the laser. **(New 3R Laser) Decal: 128-2016-2-08**

Wavelength:	658nm
Laser Power for Classification:	<5mW
Emission Type:	CW
Divergence:	3.0 mRad
Beam Diameter:	8.5 mm at aperture
Fan Angle:	57°

The Optical Scan Laser is a Class 3R laser designed to measure the profile of wheel assemblies. The laser is not a field serviceable part. No maintenance is to be performed on the laser. **(Original 3R laser) Decal: 128-1785-2-08**

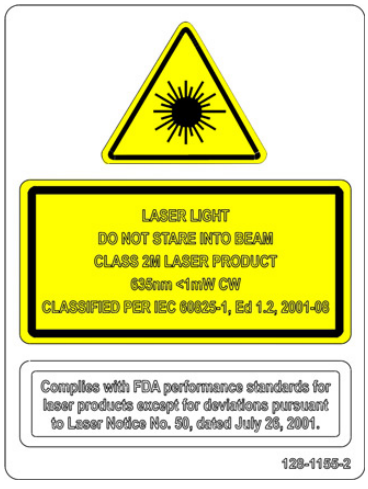
Wavelength:	635nm
Laser Power for Classification:	<5mW
Emission Type:	CW
Divergence:	1.1 mRad
Beam Diameter:	6.5 mm at aperture
Laser Beam spot size at 10m:	<10mm

HAMMERHEAD® TDC LASER INDICATOR (Optional)

The TDC (Top Dead Center) Laser Indicator is a Class 2M laser designed to aid in applying clip-on weights. The laser is not a field serviceable or adjustable part. Use caution in regard to reflective materials around the laser and never look into the laser beam.

LASER RADIATION - DO NOT STARE INTO THE BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS.

Viewing the laser output with magnifiers or related optical instruments within a distance of 100mm from the laser aperture may pose an eye hazard



2.5. Turning Power On/Off

Equipment Installation and Service

Only a Hunter Factory-Authorized Representative should perform installation. This equipment contains no operator serviceable parts. All maintenance and repairs must be referred to a qualified Hunter Service Representative

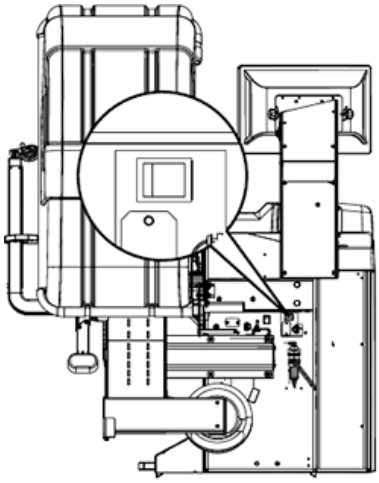
PUSH BUTTON SWITCH

The Road Force® Elite GSP9700 is equipped with a push button power switch located on the left side of the LCD support. Use this switch for normal shut down and restarting procedures.

The safety hood must be closed before touching the green “START” button, to spin the wheel.

MAIN POWER SWITCH

The main power ON/OFF switch is located on the back of the balancer cabinet. To power the balancer “ON,” press the “I” side of the ON/OFF switch. To turn all power the balancer “OFF,” press the “O” side of the ON/OFF switch



CAUTION
To prevent loss of data, always use the push button switch on the LCD support to power the balancer on and off. Then use the main power switch to remove power to the entire unit.

2.6. Equipment Specifications

ELECTRICAL	
Voltage:	230VAC +10% / -15%, 1 phase, 50/60 Hz, power cable includes NEMA 20 amp plug, L6-20P
Amperage:	10 Amperes
Wattage:	3450 Watts (peak)
AIR	
Air Pressure Requirements:	100-175 PSI (6.9-12.0 bar)
Approximate Air Consumption:	4 CFM (113 Liters/Minute)
ATMOSPHERICS	
Temperature:	+32°F to +122°F (0°C to +50°C)
Relative Humidity:	Up to 95% Non-condensing
Altitude:	Up to 10000 ft. (3048 m)
SOUND PRESSURE LEVEL	
Equivalent continuous A-weighted sound pressure at operator's position does not exceed 70 dB (A)	

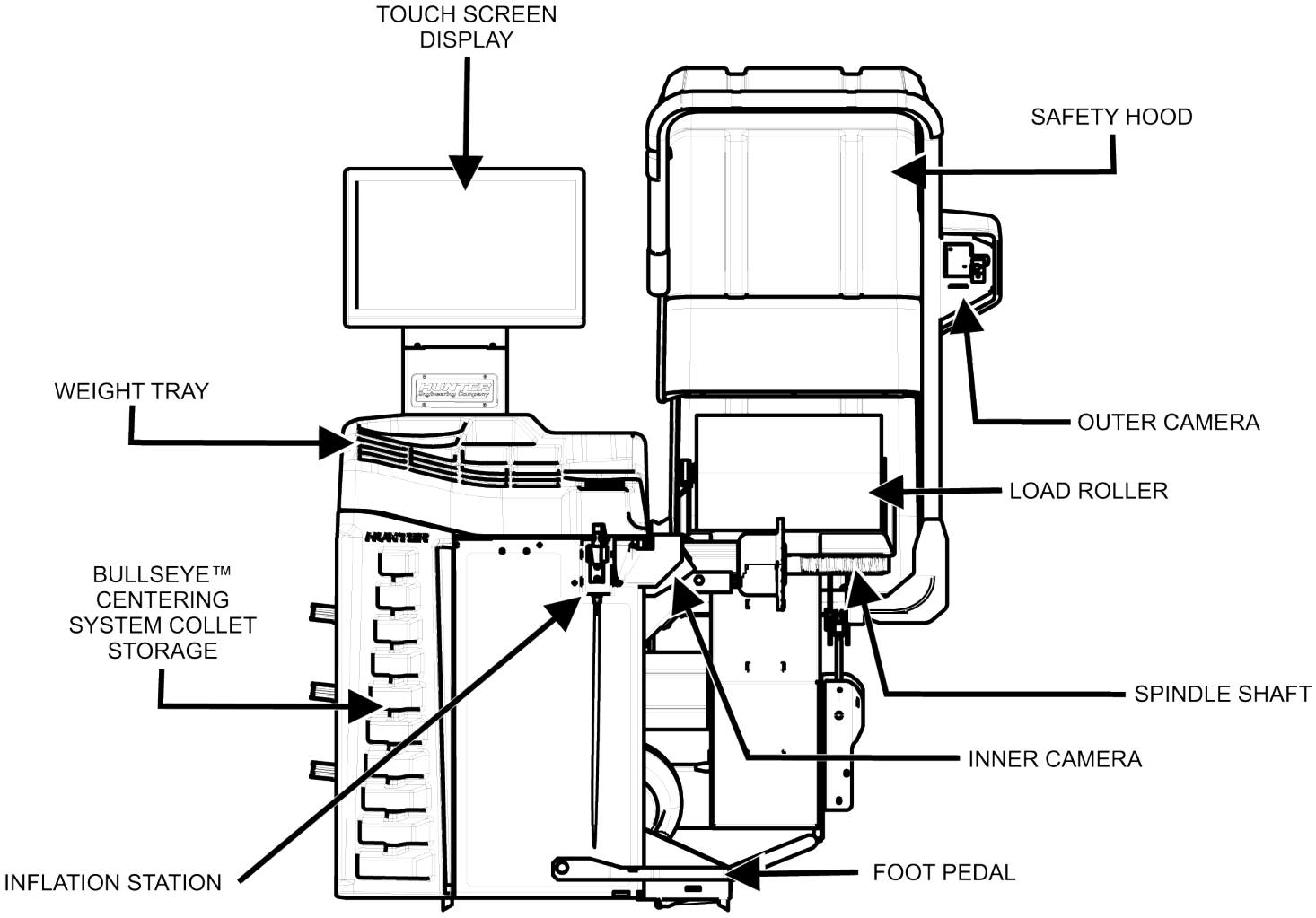
2.6.1. Explanation of Symbols

	Alternating Current
	Earth ground terminal
	Protective conductor terminal
	ON / OFF (Supply) condition
	Risk of electrical shock
	Stand-by Switch
	Not intended for connection to public network

2.7. Main Screen Components

1. Tire Stack / Vehicle Plan View Tab	10. SmartWeight® Savings Odometer
2. Load Roller	11. Road Force® Savings Odometer
3. Clip Weight Plane	12. Road Force® Limits Display
4. Tape Weight Plane	13. Road Force® Wheel Assembly Display
5. Context Sensitive Menu	14. Road Force® Menu Button
6. Wheel Assembly Display	15. eCal Button
7. Start / Stop / Servo Button	16. Spec Lookup
8. SmartWeight® Menu Button	17. Wheel Dimensions Tab
9. Imbalance and Couple Force Display	

2.8. Road Force Elite GSP9700 Components



3. Operating the Balancer

Main Balance Screen

Pull-out tabs are on the left for Tire Stack/Vehicle Information (upper tab) and Wheel Dimensions (lower tab). Buttons along the right side allow navigation to other screens and activities. Buttons in the lower left and right portions of the screen allow navigation to Road Force® and SmartWeight® procedures and options.

Main Balance Screen - Error Pop-ups

If the operator attempts to perform an illegal operation in the main balance screen, an error pop-up with appropriate information will be displayed. For example, the screen is displayed if operator attempts to start a spin without first lowering the hood.

Main Balance Screen - “Tire Rash”

After a Road Force® spin (or StraightTrak®), a colored road rash will appear on the tire. This signifies the measured Road Force® of the assembly, and corresponds to the value and color presented in the Road Force® animation in the lower left portion of the screen.

Main Balance Screen - Prompt Text

When the operator needs more info in a non-error condition, prompting text will appear in the lower portion of the screen.

Main Balance Screen – Enable and Disable Load Roller

To enable or disable the load roller in the main balance screen, touch the load roller on the screen to cycle through all available options.

Main Balance Screen – Inflation Station

When the operator attempts a loaded balance spin, and if “Prompted Inflation Station” is enabled in Setup, the operator will be prompted to answer if the tire has been inflated to the manufacturer’s specification.

Main Balance Screen – Performing a Spin

During a loaded balance spin, several things occur on the screen. First, the green Start button is replaced with a red Stop button and the tire assembly spins in 3D space. As soon as the balance portion of the spin is complete, weights will appear on the screen.

During each portion of the loaded spin, the text in the lower portion of the screen will alert the operator about what is being measured. If StraightTrak® is enabled, the lateral measurement will begin after Road Force® has been measured.

After the loaded spin is complete, and if dimensions have been entered, the 3D scene will show all information necessary to balance the assembly including; Assembly Force, Weight Amounts, Weight Type, and Weight Position.

Main Balance Screen – Servoing To Position

If servoing is enabled in Setup, the balancer will servo either the inner or outer place weight position to topdead-center. To servo to the next position, the operator can either touch the “Servo” button or touch the corresponding weight amount.

Main Balance Screen – Road Force ® Buttons

Touching the Road Force® button expands a set of button options. The load roller can be disabled/enabled. The operator can change the Road Force® limits. The “Show Savings” button can show detailed views of the cost savings from Road Force® balancing. And finally, the operator can select one of three Road Force® procedures: ForceMatching®, Measuring Individual Lateral Force, and 180 Matching. Display of historical data is also available.

Main Balance Screen – SmartWeight® Buttons

Touching the SmartWeight® button expands a set of button options. SmartWeight® can be disabled or enabled, Performance Mode can be disabled or enabled and Weight savings can be viewed.

Secondary Screens - Print Screen Button

Any secondary screens used to perform balancing procedures or to view graphs will have a print button which will send a copy of the current screen to the printer. The background will turn white to help conserve ink.

4. Balancing Procedures

4.1. Wheel Lift Operation

RAISING THE WHEEL ASSEMBLY

> ⚠ **CAUTION**
> When operating the wheel lift, make sure to maintain two-handed control of the wheel assembly.

Slide the appropriate Bullseye™ Centering System collet onto the spindle shaft. Position wheel lift carriage at the end of the wheel lift rail.

Press the lift control foot pedal “down” until the trolley carriage is at its lowest level. Roll the wheel assembly onto the wheel lift carriage. Raise the lift control foot pedal “up” to move the wheel trolley into a position where the wheel assembly can be installed onto the spindle shaft. Release the lift control foot pedal.

Slide the tire/wheel assembly onto the spindle and center on the collet. Verify that the wheel assembly is centered vertically on the spindle shaft.

> ⓘ **NOTICE**
> Lower wheel lift as needed to clamp wheel, but keep the wheel lift carriage in place under the wheel assembly.

Clamp wheel onto the spindle shaft. Keep the wheel lift carriage in place under the wheel assembly and close the hood. The lifting assembly will automatically lower and park the carriage below.

> ⓘ **NOTICE**
> Allowing the balancer to park the wheel lift carriage in place under the wheel assembly will make the removal and lowering of the wheel assembly easier and quicker.

LOWERING THE WHEEL ASSEMBLY

Starting with the wheel lift carriage parked under the wheel assembly; raise the lift control foot pedal “up” to move the lifting assembly to the wheel assembly. Release the lift control foot pedal when the assemblies contact one another. Remove wheel clamp.

Slide the carriage with wheel assembly to the end of the wheel lift rail. Press the lift control foot pedal “down” until the carriage is at its lowest level. Roll wheel assembly from carriage.

4.2. CenterChecking® Wheel Centering Feature

CENTERINGCHECK®

CenteringCheck® is an inspection or verification of the wheel’s mount to balance to identify possible centering errors, thus recognizing improper measurements. From the main balance screen, touch the “CenteringCheck” button and follow the on-screen instructions.

AUTOMATIC CENTERING CHECK

During every spin, the wheel is optically checked for offcentering and bent wheels. If the balancer detects a centering issue it will prompt a technician to perform a Centering Check. This diagnostic spin compares the centering data of the first and second spin.

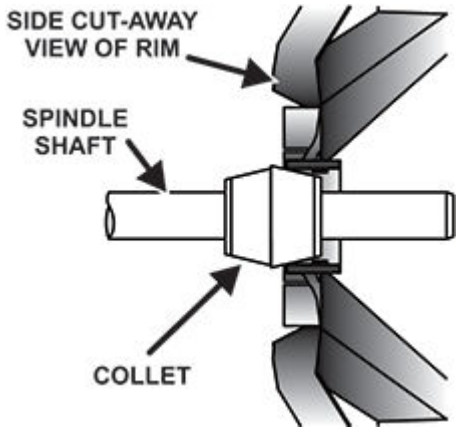
The sensitivity of the Center Check diagnostic can be adjusted in the setup menu. **Go to “Tools” > “Advanced” > “Setup” > “Prompted Centering Checks”.**

4.3. Front / Back Collet Mounting

Collet mounting is one of the most common and reliable ways to mount wheels on balancers.

The Bullseye™ Centering System is a set of collets that provides wheel centering coverage for most passenger cars and light trucks. Due to the degree of taper on the collets, multiple collets may be used on a wheel assembly. As long as the collet is in the center bore of the wheel, and does not bottom out, it can be used.

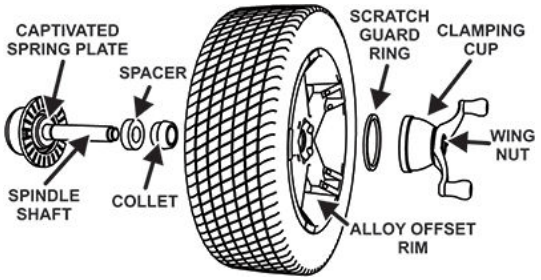
Select the proper Bullseye Centering System™ collet by placing it in the center bore of the wheel to be balanced. Select the collet that contacts the wheel nearest the center of the collet.



USING THE PLASTIC WHEEL MOUNTING SPACER

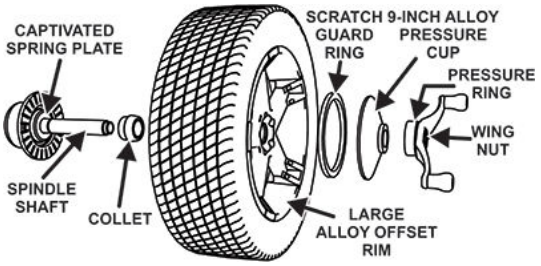
The plastic wheel mounting spacer, 46-320-2, may be used to prevent scratches on wheels where the standard plastic cup and scratch guard cannot be used.

The plastic wheel mounting washer may also be used when mounting a wheel with a large offset that is between collet sizes. Use of the washer can improve centering ability by increasing cone pressure against the wheel.



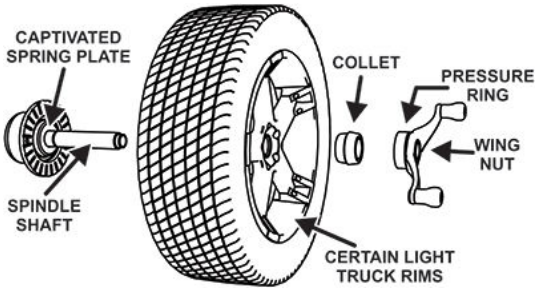
USING THE 9-INCH ALLOY WHEEL PRESSURE CUP

In some cases, the wing nut / SpeedClamp™ contact point of the wheel may be extremely wide, and the standard clamp cup will not properly contact the wheel hub area. In these cases, the optional nine inch alloy wheel pressure cup may be used in place of the clamping cup.



FRONT COLLET MOUNTING

> **NOTICE**
> Front collet mounting is generally not recommended. It should only be used in instances where traditional backside collet mounting is not possible.



This procedure utilizes a collet inserted from the front side of the wheel instead of the backside as previously described.

HEAVY WHEEL CENTERING

Heavy wheel centering may benefit by (1) pulling the tire away from the hub face at top dead center while tightening the wing nut or (2) use of optional wheel lift to position heavy wheel onto shaft and cone. This helps the wheel to overcome gravity against the hub or spacer.

4.4. Specialized Mounting Conditions

COLLET / FLANGE PLATE MOUNTING

Some wheels may be centered using the lugholes and center bore with a flange plate and collet. It is important that a back mounted collet be used to support and center the wheel when using flange plates. (Figure 32.) Flange plates are useful when the wheel cannot be properly centered off the hub bore with a collet alone because of improper fit, interference, or lack of a center hole.

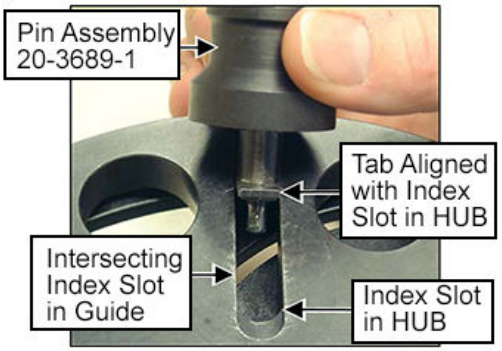
Insert Index Pin into the Flange Plate as follows:

1. Align the index slot in the hub with the index slot in the guide.

   On the hub, the one slot NOT numbered (located between the two 1-inch holes) is the index slot. On the guide, the one slot NOT grouped with the other slots is the index slot.

   The thumbscrew through the side of the flange plate limits the movement of the guide plate to keep the two index slots crossing each other.
2. Hold the adjustable flange plate with the hub (numbered slots) on facing you.
3. Insert a pin assembly, 135-378-1, into the index slots as follows:

   - Turn the guide to center the intersection of the two index slots.
   - Align the tab at the end of pin to the index slot in hub.
   - Insert the end of pin through the intersecting index slot in the guide.
   - Push down on the pin and rotate the pin a quarter turn to lock in place



4. A pin is inserted in the index slot for every wheel, regardless of the number of lugs.
5. Along with the index pin, insert additional pin assemblies, 135-378-1, into each of the correctly numbered slots as follows:

   - Turn the guide to locate the index pin near the center of index slot.
   - Align the tab of the pin assembly to the numbered slot.
   - Insert the end of pin assembly through the slot and into the intersecting slot of the guide. If more than one intersecting slot is present, use the one located in the center of the slot.
   - Push down on the pin and rotate a quarter turn to lock in place.
   - Repeat pin installation to fill each of the correctly numbered slots.

SET FLANGE PLATE FOR A WHEEL AS FOLLOWS:

WARNING
DO NOT pry or hammer stuck pins from adjustable flange plate.

The correct flange adaptor setup is determined by the following:

Measure and set the bolt circle diameter and number of studs to use against the lug holes. Set the number of lugholes as follows:

- A three-lug wheel uses three studs.
- A four-lug wheel uses four studs.
- A five-lug wheel uses five studs.
- A six-lug wheel uses three studs.
- A seven-lug wheel uses seven studs.
- An eight-lug wheel uses four studs.

NOTICE
For Ford 7 X 150 mm lug pattern, align the index pin to the 150 mm mark and insert the remaining six pins, 135-378-1, into the #7 slots. Insert the end of pin through the 3/16 inch holes in the guide plate.

Choose the correct taper design of flange studs to fit the wheel lug seats. The mounting area of the flange stud must match the design of the wheel's lughole seat or depression.

The flange plate must be able to apply pressure to the center of the wheel while maintaining perpendicularity to the shaft.

NOTICE
If the lug seats are unevenly machined or worn, an optional universal flange adaptor with compressible studs or bolt on lugs may be used to more accurately mount the wheel with the collet.

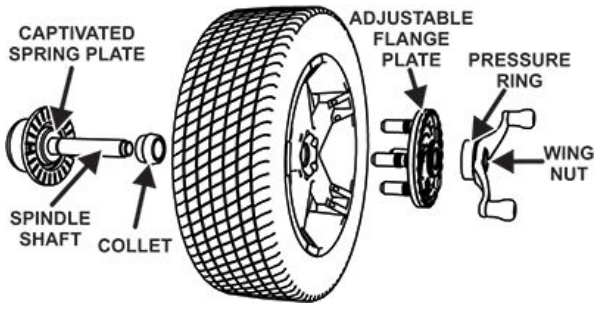
6. Choose the type of pin sleeve that best fits the lugholes in the wheel.
   - 3/4 inch diameter conical pin sleeves, 106- 145-2, will fit smaller lugholes.
   - 1-inch diameter conical pin sleeves, 106- 143-2, will fit larger lugholes.
   - 7/8-inch diameter spherical pin sleeves, 106- 144-2, will fit lugholes of many German autos

   NOTICE
   If the installation of pin sleeve is difficult or not secure, clean inside of pin sleeves and pin assemblies, then apply light machine oil to mating surfaces.

7. Push the pin sleeve to the end of pin assemblies.

USE ADJUSTABLE FLANGE PLATE TO MOUNT WHEEL TO BALANCER AS FOLLOWS:

1. Determine the cone (or collet) that best fits the center bore of the wheel to be balanced. Choose the cone the contacts the wheel nearest to the center of the cone.
2. Place the wheel-mounting cone on the spindle against the spring plate.



3. With the wheel on the garage floor, adjust the flange plate to match pins with the lug pattern of the wheel. Adjust the diameter of the pin pattern on the flange plate by turning the guide plate against the hub plate.
4. Tighten the thumbscrew located on the guide side of the flange plate to lock the guide plate and pin positions.

WARNING

The pin pattern on the flange plate must be adjusted to the diameter of the lug pattern of the wheel, prior to mounting the flange plate to the balancer. The pins will NOT self adjust as the wing nut is tightened. If the pins are not properly adjusted to the lug pattern, the pin tabs, adjustable flange plate or wheel may be damaged.

5.	Mount the wheel with the inner rim facing the balancer and centered on the cone.
6.	Mount the adjustable flange plate to spindle with pins matched to lug holes.
7.	Install the pressure ring (or clamping cup) and wing nut on the spindle shaft against the adjustable flange plate.
8.	Secure the entire assembly by firmly tightening the wing nut.

DISASSEMBLE FLANGE PLATE SET-UP AS FOLLOWS:

1.	Pull pin sleeves from the end of pin assemblies.
2.	Remove the pin assemblies from the numbered slots by pushing down and rotating each pin a quarter turn. Leave the index pin on the adjustable flange plate.
3.	Place pin sleeves and pin assemblies in the storage bin located on side of balancer

EXPANDABLE COLLET MOUNTING

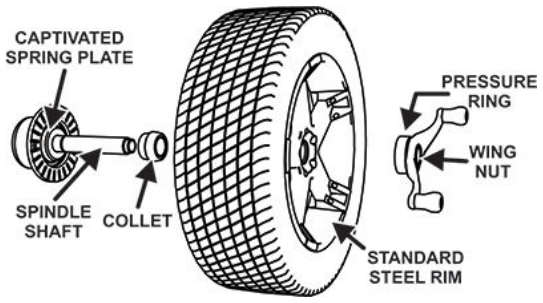
An expandable collet should NOT be used with the Road Force® / GSP9700 due to the amount of force applied by the load roller.

Using the Pressure Ring and Spacers

The Pressure Ring clips on to the wing nut. It is used in lieu of the clamping cup.

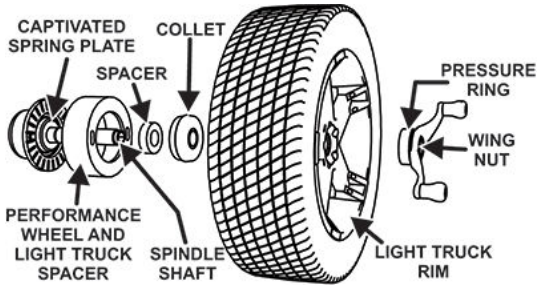
It may also be used in place of a clamping cup if space is limited between the wheel and the end of the spindle.

The pressure ring should be used to prevent the wing nut from directly contacting an adaptor or a collet. It will act as a bearing to enable higher clamping forces.



HUB RING SPACERS

These spacers are designed to build a larger pocket when using extra large collets. It also provides a location for the centering pins found on some dual wheel configurations.



4.5. Wheel Assembly Selection for Saving Spin Data

SAVING SPIN DATA

Saving Spin Data The Road Force® Elite GSP9700 automatically tracks the wheel assembly currently being balanced.

The balancer assumes that the technician is working “around the vehicle” by beginning at the LEFT FRONT and working around the vehicle in a clockwise fashion. Successive spins are stored as either “before” or “after” data based on the following rules:

- If the weight displays read “OK/OK” or is blank, assume the next complete spin is “before” data.
- If the weight displays read anything other than “OK/ OK” or is blank, assume the next complete spin is “after” data.

MEASUREMENT STORAGE

The Road Force® Elite GSP9700 automatically tracks the wheel assemblies as they are balanced. As the wheel assemblies are balanced, their status can be viewed as they would appear on the vehicle currently being serviced.

Select the VirtualView® button to expand the VirtualView® panel. The panel can be further expanded to show detailed information for up to the last eight wheel assemblies balanced.

PRINT SUMMARY

A printout is available that incorporates a detailed image of each wheel assembly with the stored measurements. If a measured value is out of tolerance compared to the recalled specification, the value will be printed in red. From the main balance screen, select “Print” and “Vehicle Summary”.

The Vehicle Summary screen will be displayed.

SINGLE ASSEMBLY ROAD FORCE® PRINTOUTS

The Road Force® Elite GSP9700 allows for single wheel assemblies to be printed for situations when Road Force® is only needed for a single wheel. Select “Print” to send before and after balance summary results to the printer.

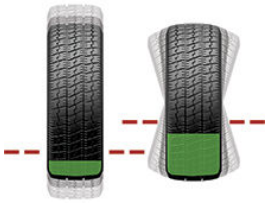
4.6. Balance Modes

SmartWeight Balancing Technology®

SmartWeight Balancing Technology® is a method of reducing forces on a wheel during balancing. SmartWeight® is not a procedure.

Instead, it measures the forces of side-to-side movement and up-and-down shake and computers weight to reduce these forces. This reduces the amount of correction weight used, balancing time required, check spins needed and “weight chasing”.

SmartWeight saves the shop time and money.



DYNAMIC BALANCING - TRADITIONAL BALANCING MODE

NOTICE
SmartWeight Balancing Technology® is the default balancing method and is the most recommended way to accurately balance wheel /tire assemblies.

NOTICE
Enter wheel dimensions before selecting dynamic balancing. If SmartWeight® mode is enabled in setup, the balancer will return to SmartWeight®balancing upon dimension entry.

Dynamic balancing will always display two weight planes.It provides a more complete balance than static balancing.Dynamic balancing should be selected whenever possible to minimize vehicle vibration.

Switching from SmartWeight Balancing Technology® to Traditional Dynamic Balancing

At any time, SmartWeight Balancing Technology® can be switched to standard balancing provided that both standard and SmartWeight® balancing modes are enabled in setup.Touch the SmartWeight® button to display the Smart-Weight® menu buttons.

NOTICE
When changing to traditional dynamic balancing mode, weight amounts as well as weight placement locations change.

STATIC BALANCING - TRADITIONAL BALANCING MODE

NOTICE
Enter wheel dimensions before selecting dynamic balancing. If SmartWeight® mode is enabled in setup, the balancer will return to SmartWeight® balancing upon dimension entry.

Static balancing provides a less desirable balance than dynamic balancing. Dynamic balancing should be selected whenever possible to minimize vehicle vibration.Switching from Traditional Dynamic Balancing to Traditional Static Balancing.

In non-SmartWeight® mode, the balancer can be switched from dynamic balancing to static balancing.

DYNAMIC MODE

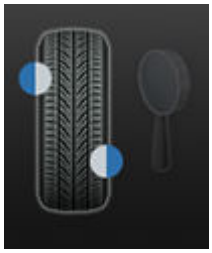
STATIC MODE

Blinding and Rounding

In non-SmartWeight® mode, the balancer can display either an “actual” or “blinded and rounded” amount of imbalance.

Touching the magnifying glass icon next to the dynamic or static icons will toggle blinding and rounding on or off.

DYNAMIC MODE, binding/rounding

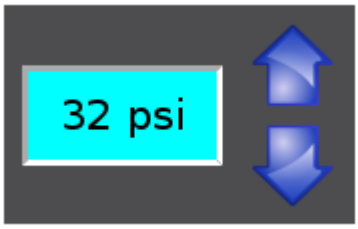


STATIC MODE, binding/rounding

4.7. Inflation Station

Inflation Station provides preset tire pressure setting to ensure accurate Road Force Measurement® (before and after matching) and safe assemblies for final mounting on the vehicle. Road Force® Elite GSP9700 can reduce as well as increase the tire pressure. Lift the hose from the storage position (while in the “Balance”or “Runout > Road Force®” screens) and the Inflation Station screen will automatically pop up.

Upon sensing that the air hose is attached to the valve stem, the tire pressure will automatically be set to the target air pressure. The target air pressure is set by the operator, touching the “up” or “down” arrows on the inflation screen.



In cases of a tire with pressure below 15 psi, “Auto-Set Pressure” can be selected to begin filling.

Touch “Hold Pressure” or “Exit” at any time to halt auto pressure setting.

When the tire reaches the dialed-in pressure, the on screen tire graphic will turn green.

The Inflation Station screen exits automatically if the air hose is removed from the valve stem, or if manually exited by touching the “Exit” button.If the procedure is stopped before completion, an error message will be displayed indicating that target pressure has not been achieved.

For safety, spinning is prevented for the following conditions:When the Inflation Station screen is displayed, the hose is not at the storage position The hose is pressurized (not disconnected from the valve stem).

4.8. Quick-Thread® Wheel Clamping

Quick-Thread® is an “intelligent” DC drive motor control feature that allows motor assisted threading for fast installation and removal of the Road Force® EliteGSP9700 wing nut.

DANGER
Keep clear of clamping components during Quick-Thread shaft rotation.

WARNING
Quick-Thread® does not tighten the wing nut! In Quick-Thread® rotation, torque allowed is minimal. Therefore, the wing nut must still be hand-tightened before balancing.

NOTICE
Because of the software limited torque control, you must loosen the wing nut before Quick-Thread® will remove it.

SpeedClamp™ Wheel Clamping (Optional) SpeedClamp™ is an optional spindle equipped with a pneumatic clamping device that eliminates the spin-on type wingnut. Double tap the foot pedal to clamp and unclamp.

4.9. Motor Drive/Servo-Stop, Spindle-Lok®, and Safety Hood

MOTOR DRIVE / SERVO-STOP

The intelligent DC motor drive on the Road Force® EliteGSP9700 is able to position and hold the tire assembly in position for weight application, apply different amounts of torque, and control the speed and direction of the spindle.

When the “Start” button is touched with the hood in the raised position, while weights are showing, the motor will automatically rotate the wheel to the next weight plane and hold the assembly in position for weight or mark application.

Alternatively, touching the weight amounts will achieve the same results.

SPINDLE-LOK® FEATURE

Depressing the foot pedal will lock the spindle. Locking the spindle will stabilize the wheel for attaching weight sat precise locations if automatic weight positioning is disabled,and will allow for tightening and loosening of the wing nut. Do not use the Spindle-Lok® as a brake to stop a spinning wheel.

NOTICE
Depressing the foot pedal will cancel Servo-Stop.

WARNING
Using the Spindle-Lok® to stop a spinning wheel may result in personal injury or damage to the balancer.

SAFETY HOOD FEATURES

Hood Autostart

The balancer can be set to automatically spin the wheel upon hood closure. After a spin, the hood must be raised completely before the balancer will Autostart again. For safety, the balancer will not Autostart in “Calibration,” “Setup,” “Diagnostics,” if no balancing procedure is selected, or if the Inflation Station hose is out of its “home position.”

Auto Hood Feature

The balancer can be set to automatically raise the hood after a spin has been completed.

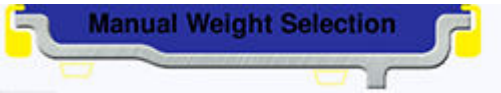
WARNING
Keep body parts and items away from the hood while a spin is in progress. Never reach under the hood while the balancer is performing a runout measurement or balance spin.

4.10. Balancing Procedures for Specific Weight Types and Placement using TruWeight®

The Road Force® Elite GSP9700 offers both automatic and manual modes for weight placement.

Automatic Mode

Manual Mode



Clip-clip, tape-tape and mixed weight modes are available for both dynamic and static balancing. With these options, correction weights can be placed at an infinite number of locations, based upon the choice of the operator. Automatic is the default setting, automatically choosing the correct type of weights and locations determined by optical scan.

TruWeight® shows the operator exactly how to place the weights on the wheel. Place them exactly as displayed on the screen.

SmartScan™ Dimensions Entry

From the main balance screen, the operator can take wheel dimensions using SmartScan™ dimension entry.This is done automatically by SmartScan’s™ inner and outer cameras when lowering the hood and performing a balance spin. Runout, rim dimension, spoke and weight plane location, as well as the wheel weight type (either clip or tape) are calculated automatically by SmartScan™on every spin.

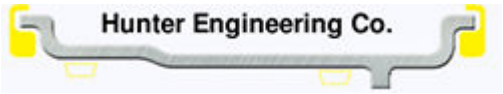
NOTICE
If a wheel weight type other than what is determined by SmartScan™ is desired, users may touch a different weight plane to change weight type.

NOTICE
Incorrect or missing spoke locations do not affect the balancer's ability to properly balance wheels. Rim profile calculations are performed separately from spoke identification. This can be verified by comparing the appearance of the 3D generated profile to the actual wheel. Simply touch the"Enter Spokes" button and enter spoke locations manually to correct spoke identification errors.

Single Weight Placement

Occasionally, regardless of the weight mode, a single tape weight is shown in the middle of the wheel. Place the weight as shown on-screen. The crucial task is to lineup the center of the weight with the laser line. The depth of placement does not need to be exact, use features of the rim profile to determine the location.

4.10.1. Balancing Procedure Using Clip-On Weights

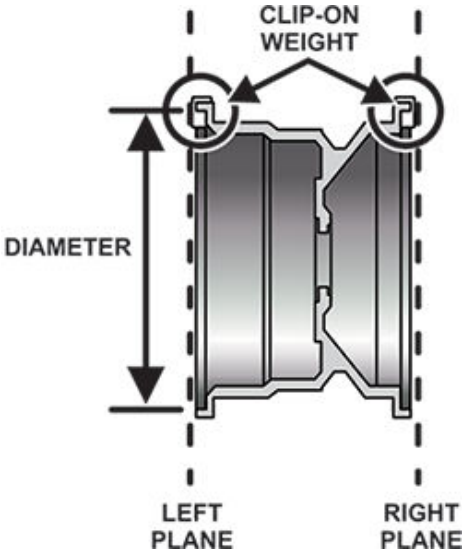


Verify the correct clip-on weight type will be used for the wheel that is being balanced.

Verify that the wheel is clean and free of debris. Remove all previous weights.

Mount tire/wheel assembly. Close safety hood. Touch the green "START" button if "Hood Autostart" is disabled.

As the wheel is spinning, the amount(s) of corrective weight(s) needed will be shown on the screen. This time can be used to find and prepare the needed weights.



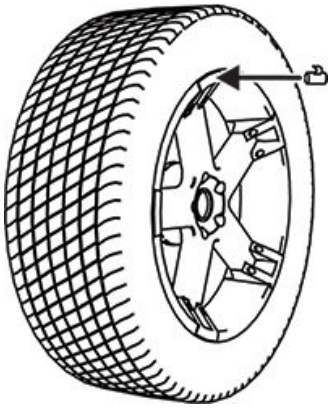
NOTICE
Once weight amounts are shown on the screen,they can be toggled to display either ounces or grams by pressing the "oz" or "g" graphic shown after the weight amount.

After wheel comes to a complete stop, raise the safety hood.

The Road Force® Elite GSP9700 will find the top-dead center (TDC) for the first weight plane if “Servo-Stop” is enabled. “Servo-Stop” will hold the wheel in the TDC position while the weight is applied.

Attach the weight amount shown on the screen for the selected weight plane to the correct side of the wheel.

TruWeight® shows the operator exactly how to place the weights on the wheel. Place them exactly as displayed on the screen.



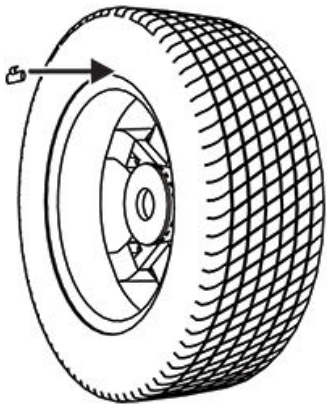
NOTICE
If the optional HammerHead® TDC weight locator is installed, the weight should be applied at the location marked by the laser.

Touch the green “START” button with the safety hood in the raised position. The Road Force® Elite GSP9700 will rotate the wheel to TDC for the next weight plane. The view of the wheel will also change to the next plane view and the weight amount for the next plane will be displayed in green.

NOTICE
Optionally, pressing the next plane weight amount will rotate the wheel to TDC for the next weight plane.

Attach the weight amount shown on the screen for the selected weight plane to the correct side of the wheel.

TruWeight® shows the operator exactly how to place the weights on the wheel. Place them exactly as displayed on the screen.



NOTICE
If the optional HammerHead® TCD weight locator is installed, the weight should be applied at the location marked by the laser.

Close the safety hood to perform a check spin. Left and right weight plane displays should show “OK”after the check spin.

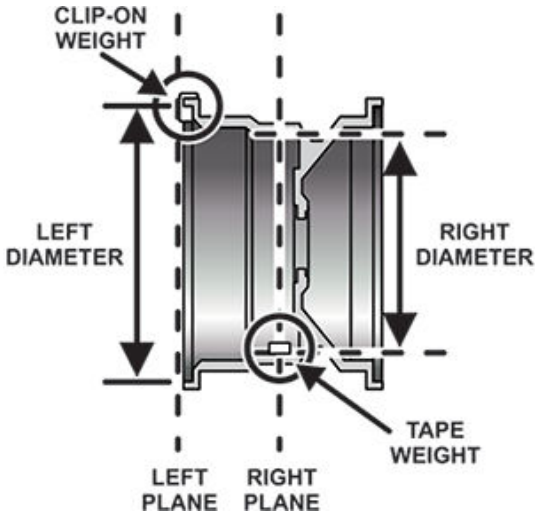
The clip-on weight balancing procedure is complete.

4.10.2. Balancing Procedure Using a Combo of Clip-On & Adhesive (Tape) Weights (Mixed Weights)

Verify that the wheel is clean and free of debris.Remove all previous weights.Mount tire/wheel assembly.

Close the hood to perform a balance spin to measure the distance, diameter, runout and rim width dimensions.

As the wheel is spinning, the amount(s) of corrective weight(s) needed will be shown on the screen. This time can be used to find and prepare the needed weights.

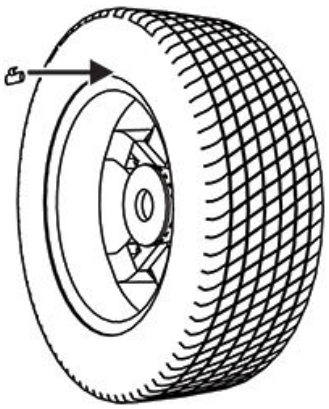


After wheel comes to a complete stop, raise safety hood.

The Road Force® Elite GSP9700 will find the top-dead center (TDC) for the first weight plane if “Servo-Stop” is enabled. “Servo-Stop” will hold the wheel in the TDC position while the weight is applied.

Attach the clip-on weight amount shown on the screen for the left weight plane to the inner rim of the wheel.

TruWeight® shows the operator exactly how to place the weights on the wheel. Place them exactly as displayed on the screen.



NOTICE
If the optional HammerHead® TDC weight locator is installed, the weight should be applied at the location marked by the laser.

Touch the green “START” button with the safety hood in the raised position.

NOTICE
Optionally, pressing the next plane weight amount will rotate the wheel to the next weight plane.

The Road Force® Elite GSP9700 inner camera quickly locates and marks adhesive weight positioning.

The laser locator automatically displays a vivid line at bottom dead center after a wheel has been spun. The laser turns off when the wheel is spun again.

CAUTION
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

With the servo enabled, attach the adhesive weight using the weight amount shown for the right weight plane on the screen.

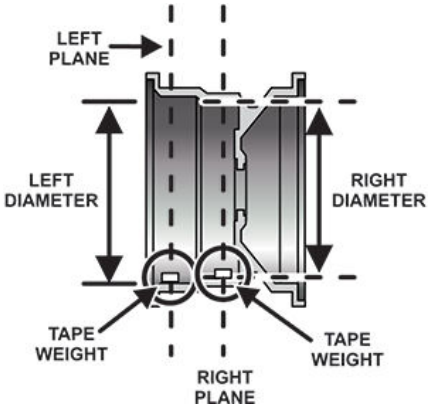
TruWeight® shows the operator exactly how to place the weights on the wheel. Place them exactly as displayed on the screen.

Close the safety hood to perform a check spin.

Left and right weight plane displays should show “OK”after check spin.

MIXED WEIGHTS balancing procedure is complete.

4.10.3. Balancing Procedure Using Adhesive (Tape) Weights



Verify that the wheel is clean and free of debris. Remove all previous weights.

Mount tire/wheel assembly. Close the hood to perform a balance spin. Information is computed automatically.

As the wheel is spinning, the amount(s) of corrective weight(s) needed will be shown on the screen. This time can be used to find and prepare the needed weights.

NOTICE
Once weight amounts are shown on the screen,they can be toggled to display either ounces or grams by pressing the “oz” or “g” graphic shown after the weight amount.

After wheel comes to a complete stop, raise the safety hood.

NOTICE
If Auto Hood is enabled, the hood will raise automatically.

The Road Force® Elite GSP9700 Servo-Activated Laser automatically locates adhesive weight positioning.

The laser weight locator automatically displays a vivid line after a wheel has been spun. The laser turns off when the wheel is spun again.

CAUTION
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

With the servo enabled, attach the adhesive weight using the weight amount shown for the left weight plane on the screen.

TruWeight® shows the operator exactly how to place the weights on the wheel. Place them exactly as displayed on the screen. Touch the green “START” button with the safety hood in the raised position.

> **NOTICE**
> Optionally, pressing the next plane weight amount will rotate the wheel to the next weight plane.

Close the safety hood to perform a check spin. Left and right weight plane displays should show “OK” after the check spin.

ENABLE DRAGGING FEATURE

The Enable Dragging feature allows the user to drag tape weights to a specific area of the wheel.

Touch the “Measurements” icon on the left side of the screen after a balance spin. Touch the “Enable Dragging” button on the right hand side of the screen. Users can now drag the tape weight(s) as desired.

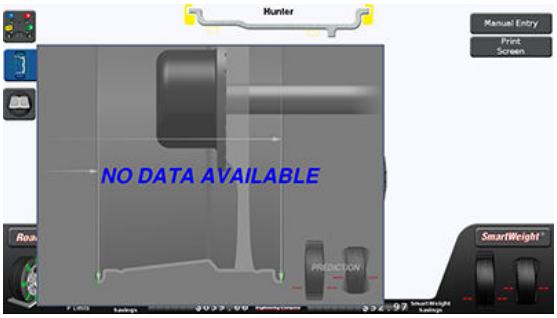
4.11. Rim Dimension Manual Entry

RIM DIMENSION MANUAL ENTRY - TAPE / TAPE

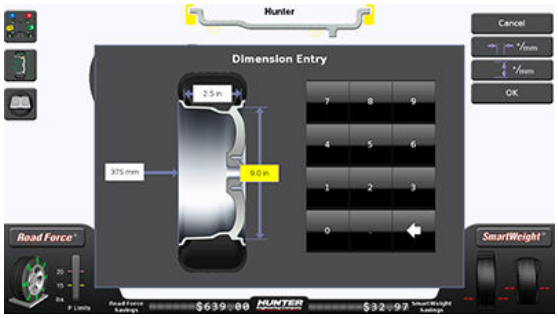
In the event of an SmartScan™ failure, balancing can still be performed by using a tape measure to manually input rim dimensions.

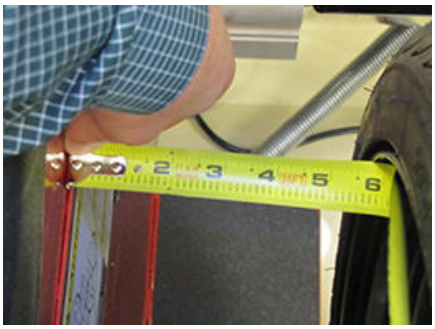
Press the dimension button on in the upper left-hand portion of the screen.

Press the Manual Entry button in the upper right-hand portion of the screen.



Use a tape measure to measure the lengths called out on-screen. Touch each box and enter the appropriate measured dimensions. When finished, press OK to end manual dimension entry.



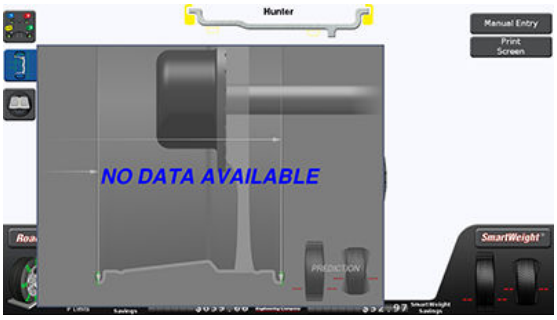


RIM DIMENSION MANUAL ENTRY - CLIP / CLIP

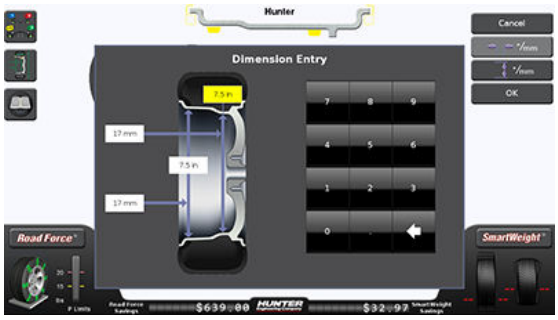
In the event of an SmartScan™ failure, balancing can still be performed by using a tape measure to manually input rim dimensions.

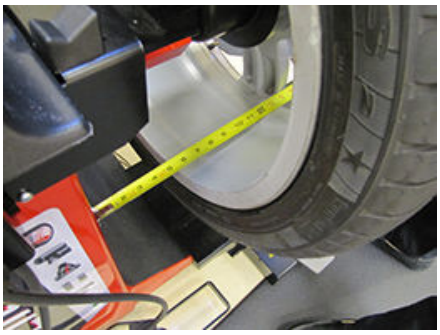
Press the dimension button on in the upper left-hand portion of the screen.

Press the Manual Entry button in the upper right-hand portion of the screen.



Use a tape measure to measure the lengths called out on-screen. Touch each box and enter the appropriate measured dimensions. When finished, press OK to end manual dimension entry.





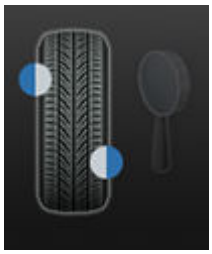
4.12. Blinding and Rounding

In non-SmartWeight® mode the balancer can display either an “actual” or “blinded and rounded” amount of imbalance.

“Blind” is a tolerance or amount of imbalance required before an imbalance amount is displayed. “Round” allows the balancer to display weight imbalance to a desired increment. The blind and round values can be changed in the “Setup” procedure.

While in the “Balance” primary screen, blind and rounding may be disabled by touching the screen to highlight the magnifying glass. The actual amounts of imbalance for the selected mode will be displayed when “Blind and Rounding” are disabled as shown below.

Dynamic mode, blinding/rounding is disabled



Static mode, blinding/rounding is enabled

4.13. Tape Weight Menu & Split Spoke Feature

TAPE WEIGHT MENU

By touching a weight on the wheel, such as the strips of weight shown below, a weight style menu will appear. This offers the ability to change to another style of tape weight and/or split the weight. This can improve balancing accuracy.

Split Weight®

The split weight® software fans the weight on selected plane into two smaller weights. Repeated touches of “Split the Weight” will provide alternate choices where the weights fan further apart but become larger to accommodate the correction needed.

Correcting Large Imbalances

Split Weight® can also be used to apply three weights when needed.

SPLIT SPOKE FEATURE

When in either mixed weight or adhesive weight modes, (dynamic or static), correction weights can be hidden behind the spokes of a wheel.

Split Spoke® can be turned on as used as the default based on the wheel scan. If the Split Spoke® feature of hiding weights behind spokes is to be used, touch “Spokes” > “Enter Spokes”. Follow the on screen instructions. Move to the next spoke and repeat. 2 spoke locations are entered. Continue the balance procedure as normal.

NOTICE

When SmartWeight® is enabled in conjunction with wheel spoke entry, the “SmartSpoke®” weight locator feature can in many instances allow the use of weight at only one spoke when it would have required two using conventional spoke mode balancing.

4.14. Optional HammerHead® TDC Laser Clip-On Weight Locator

The balancer will find the TDC for the left or right weight plane if “Servo-Stop” is enabled. “Servo-Stop” will hold the wheel in the TDC position while the servo-activated laser automatically locates TDC to aid in fast clip-on weight positioning.

The HammerHead® TDC Laser System automatically displays a vivid line at top dead center after a wheel has been spun. The laser turns “off” when the wheel is spun again.

WARNING
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

This Laser Product is designated as Class 2M during all procedures of operation.Never look directly into the laser. Doing so may cause serious injury.

Operation accessible radiation fields	
Wavelength:	635-660nm
Laser Power for Classification:	<1mW via 7mm aperture
Beam Diameter:	<5mm at aperture
Divergence:	<1.5mrad x <2rad
Transverse Beam Mode:	TEM00

WARNING
Use of controls, adjustments, or performance of procedures other than those specified herein may result in hazardous radiation exposure.

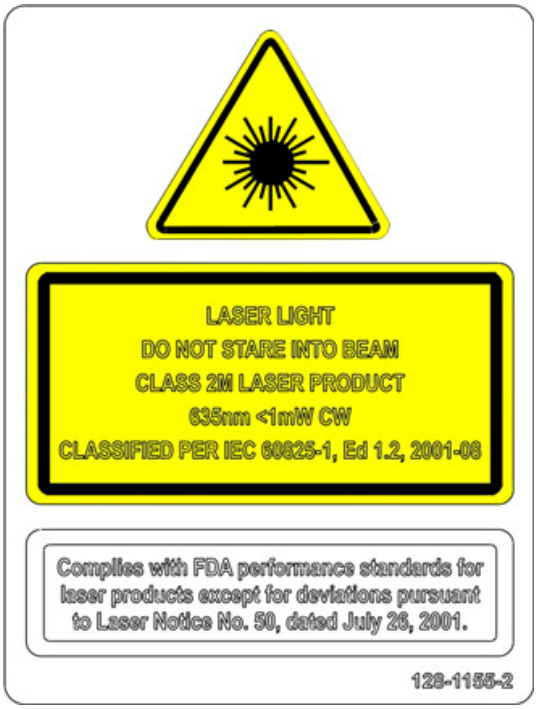
This Laser Product is designated as Class 2Mduring all procedures of operation.

Do not stare into the beam or view directly with optical instruments. Doing so may cause serious injury. Do not intentional use a reflective device to enhance or re-direct the laser. Do not operate the laser if the cover or seal is damaged.

There is no required maintenance or service to keep the HammerHead™ TDC Laser System in compliance. The laser is not a field serviceable or an adjustable part.

Specific Precautions / HammerHead® TDCLaser System

Use caution in regard to reflective materials around the laser and never look into the laser beam



Any necessary repair or maintenance should be done by the factory only. The HammerHead™ TDC Laser System has no field serviceable parts.The unit should never be opened or modified.

This unit should never be opened or modified.

4.15. TPMSpecs™ Feature & Hunter Help

TPMSpecs™ Feature

NOTICE
TPMS specifications can also be found on Hunter Aligners (with WinAlign 11.0 and greater) and online at UnderCarInfo.NET (subscription service).

The TPMSpecs® feature identifies vehicles with tire pressure monitoring systems. It also provides in depth information regarding the service of TPMS.

- TPMS Type
- Sensor Type
- Reset Required on Tire Rotation or Replacement
- Reset Tool Requirement
- Required Tools
- Reset Procedure
- TPMS Hints
- Information / Disclaimers

TPMSpecs® may be accessed in two ways

Option 1:

From the Main Balance screen, scan a VINbarcode. TPMS information for the vehicle scanned will be automatically retrieved and displayed.

Option 2:

From the main balance screen, touch the “Tools” > “TPMS” buttons.

The main TPMSpecs® screen is displayed. Select the make, model and specifics of the vehicle being serviced.

The “AT A GLANCE” overview starts each vehicle TPMS specification. The first image shows the type of TPMS sensor on the vehicle. The following three images show the requirements for servicing the wheel: process, scan tool and OEM scanner. The red border, yellow border or grayed appearance of the image denotes the requirement as required, optional or not required. Red and white striped border indicates the requirement is possibly required; refer to the explanation below the images.

Scroll up or down by dragging the scroll bar, or touching the “up” and “down” arrows on the right side of the screen.

Touch the “Home” button to return to the main TPMSpecs® Menu. Touch the “arrows” to navigate backward or forward. Touch the “print” button to print the current page. Touch “X” to return to the balancer screen.

Hunter Help - Video Player

The Video Player feature provides tips and procedures for using the HD Elite®. To access the Video Player:

From the main balance screen, touch the “Help” > “Launch Video Player” buttons.

The main video menu screen is displayed.

Select a topic from the menu to view the video.

NOTICE
The video screens may change as new content is added.

The selected video will begin playing.

Go back in the video by touching the “back” button. Play the video by touching the “play” button. Stop the video by touching the “stop” button. Go forward in the video by touching the “forward” button. Decrease the video volume by touching the “-” button. Mute the video volume by touching the “mute” button. Increase the video volume by touching the “+” button.

Exit the video player by touching the “Exit” button.

Launch Help

The Hunter Help feature provides tips and procedures for Hunter balancers and tire changers. It also provides a Rolling Smooth Sample Quiz. Additional content will be added to the Hunter Help files and can be updated as it becomes available. To access Hunter Help:

From the main balance screen, touch the **“Help” > “Launch Help”** buttons.

The Main Menu of Hunter Help is displayed. Select the item to view by touching the selection.

NOTICE
The help screens may change as new content is added.

Some items have sub-menus that will display help on a specific topic. Touch to view the selected topic. Detailed help on specific topics can also be printed. Select “Print” to print the page currently being viewed.

Scroll up or down by dragging the scroll bar, or touching the “up” and “down” arrows on the right side of the screen. Touch the “Home” button to return to the main Hunter Help Menu.

Touch the “arrows” to navigate backward or forward. Touch the “print” button to print the current page. Touch “X” to return to the balancer screen.

5. SmartWeight® Balancing

5.1. SmartWeight® Balancing Technology

SmartWeight® Balancing Technology is not a procedure. Rather, it is a technology that measures the forces of couple side-to-side shimmy and static up-and-down shake and computes the correction weight required to reduce these forces. This reduces the amount of weight used, reduces time, reduces check spins, “chasing weights”, and saves shop time and money.

SmartWeight® Balancing Technology can reduce the number of steps in the balancing process. Not only does SmartWeight® Balancing Technology give the customer abetter riding vehicle, it also helps the environment by using less corrective weight.

Static and non-rounding modes are eliminated to simplify operation. Always enter at least two weight positions during wheel measurement in SmartWeight® balancing mode. All other functions are identical to the traditional balancing method.

Static and Dynamic Imbalance Sensitivity As a general rule of thumb, to achieve the best balance on an average sized tire and wheel assembly Residual static imbalance should be less than 1/4 ounce (7grams).

- Residual couple imbalance should be less than 3/4ounce (21 grams).
- Residual couple imbalance is preferred over remaining static imbalance.
- It takes much more residual couple imbalance weight to cause a vibration than the same amount of static imbalance correction weight.
- The larger the diameter used for weight placement,the smaller the amount of correction weight is required for static correction.
- The wider the distance between the two weight placement locations, the smaller the amount of correction weight is required for couple correction.
- If static balance is the only option, always verify that the remaining couple residual imbalance is within acceptable tolerance. This can only be verified using SmartWeight® balancing.

NOTICE
SmartWeight® balancing performs this check automatically.

5.2. Dynamic Weight Planes

SmartWeight® requires the operator to enter at least two weight planes. This balancing method will automatically determine if one or both weight planes require a weight to be added. This eliminates “blinded” static single plane balancing, which alone may not be sufficient to solve couple vibration issues.

The Road Force® Elite GSP9700 balancer offers two primary ways to balance tires:

SmartWeight® Balancing Technology

Traditional balancing technology

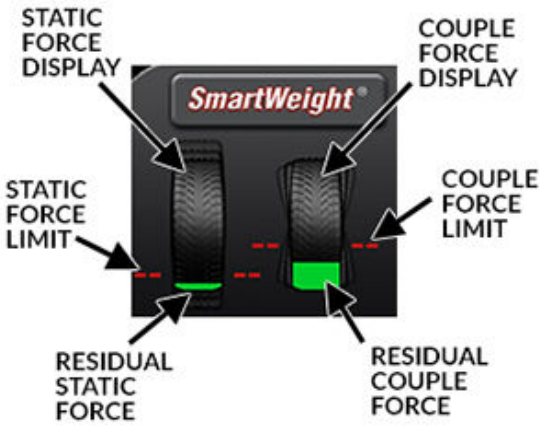
Both of these methods can balance tires dynamically. The main difference being that SmartWeight® will reduce the amount of corrective weight in a basic wheel balancing situation and automatically optimize static force reduction and single plane weight placement.

5.3. Using SmartWeight® Balancing Technology

The SmartWeight® balancing forces display varies greatly from the standard balancing display.

SmartWeight® tire graphs independently display the static and couple forces within a tire/wheel assembly. A single plane (static) mode and non-round off modes are no longer necessary.

The traditional “static” and “dynamic” modes are eliminated. The traditional non-round off mode is eliminated. These modes are no longer necessary with SmartWeight® balancing.



The red-dotted line represents the acceptable amount of force the tire and wheel assembly can have that will not result in a ride problem. Any forces below that line will be shown in green. Any forces that are above that level will be shown in red and indicate an excessive amount of force.

Install a tire/wheel assembly as normal. Rim measurements are not required to determine if the balance forces are exceeded. Lower the hood and spin.

Prior to balance spin, the tire graphs will display no color. The SmartWeight® balance force graphs will display red for excessive forces and green for acceptable amounts of force.

If the SmartWeight® balancing procedure requires correction weights, wheel dimensions will be required. Close the hood and perform a spin.

After the spin is complete, the screen will display the amount and location of corrective weight necessary.

Install the weights as indicated on the screen using the TruWeight® feature. Lower the hood to re-spin and check the balance.

The balancer displays “OK,” indicating that the force levels are reduced to within the acceptable tolerances.

5.3.1. Switching from SmartWeight® Balancing to Traditional Dynamic Balancing

At any time, SmartWeight® Balancing Technology can be switched to standard balancing provided that both standard and SmartWeight® balancing modes are enabled in setup. Touch the SmartWeight® button to display the SmartWeight® menu buttons.

NOTICE

SmartWeight® Balancing Technology is the default balancing method and is the most recommended way to accurately balance wheel / tire assemblies.

Touch the Disable SmartWeight® button. The balancer is now in traditional dynamic balancing mode.

NOTICE

When changing to traditional dynamic balancing mode, weight amounts as well as weight placement locations change.

5.3.2. Switching from Traditional Dynamic Balancing to Traditional Static Balancing

In non-SmartWeight® mode, the balancer can be switched from dynamic balancing to static balancing.

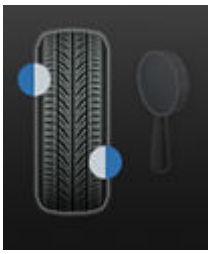
Dynamic mode is selected:

Touch the **static mode** icon for static mode balancing.

Blinding and Rounding

In non-SmartWeight® mode, the balancer can display either an “actual” or “blinded and rounded” amount of imbalance. Touching the magnifying glass icon next to the dynamic or static icons will toggle blinding and rounding on or off.

Dynamic mode, blinding/rounding is disabled:



Static mode, blinding/rounding is enabled:

Enable Performance Mode

In SmartWeight® mode, the balancer can be switched to performance mode.

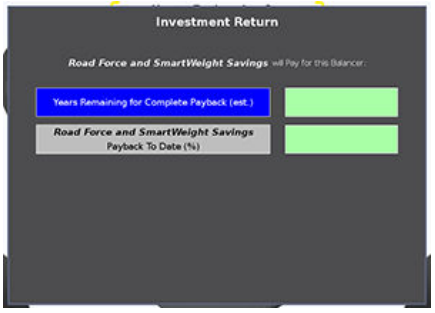
Touch the Enable Performance Mode button.

Table 1. Show Savings

Touch the Show Savings button. The SmartWeight® Savings screen will be displayed.

Touch the Show Details button to view details of SmartWeight® savings. The Weight Savings screen will be displayed.

Touch the Investment Return button. The SmartWeight® and Road Force® Investment Return screen will be displayed.



6. Road Force Measurement® Procedures

6.1. Load Roller Operation

The load roller runs parallel to the tire and applies a perpendicular load on the assembly to take information required for the Road Force Elite Measurement® system. It is capable of applying up to 1250 pounds of force. The amount of force placed on the tire is dependent upon the tire's diameter and stiffness. The load roller will not overload the tire.

WARNING
Do not use the load roller on assemblies with studded tires.

NOTICE
It is important that the air pressure of the tire is set to specifications prior to using the HD Elite Measurement® system. Incorrect tire pressure will affect the results. If the Road Force® Elite GSP9700 is equipped with the Inflation Station feature, the tire can be easily set to the specified air pressure.

The load roller can be enabled and disabled by touching the load roller on the screen.

When the load roller is enabled, the screen will display the load roller with enabled settings.

When the load roller is disabled, a red "X" appears on the load roller.

The load roller can also be enabled and disabled by touching the Road Force® button then touching the "Toggle Roller" button.

Road Force® with Limits Enabled

When the load roller is enabled, "LT Tires," "P-SUV Tires," or "P Tires" Road Force® limits can be changed. Changing the "LT Tires," "P-SUV Tires," or "P Tires" selection will change the limit specifications for Road Force® and rim runout.

NOTICE
The load roller cannot be enabled in "Bare Rim Spin" mode.

To change Road Force® limits touch the **"Road Force®" > "Change Limits Type"** button. Touch the type of limits to use.

6.2. Forcematching®

Forcematching® is a method of aligning the stiffest spot of the radial tire road force first harmonic (once-per-revolution component) with the average low point of the radial rim runout first harmonic to decrease vibration in the wheel assembly.

This type of match mounting has been done with expensive equipment by the tire/wheel manufacturers and OEMs for years to provide the smooth ride associated with a new vehicle. The Road Force® Elite GSP9700 provides “Forcematching®” at a service level.

When the Road Force® Elite GSP9700 performs a spin with the load roller enabled, it measures the road force of the wheel assembly. ForceMatch® is enabled on every Road Force® spin.

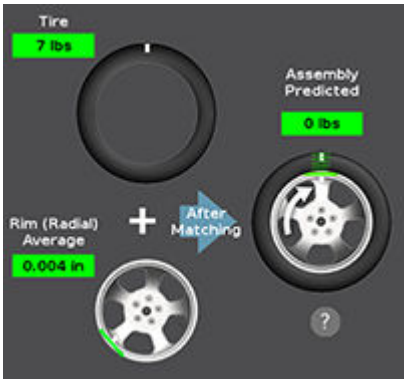
NOTICE
It is important that the air pressure of the tire is set to specifications prior to using the Road Force Measurement® system. Incorrect tire pressure will affect the results.

ForceMatch® - Display of Data

Press ForceMatch® in the RoadForce menu and after the assembly has been spun, the ForceMatch data will display on screen.

The upper left corner of the screen displays Road Force® and runout data. A 3D display of the assembly is shown, with corresponding “chalk marks” on both the tire and rim.

Matching the chalk marks will produce the minimum available Road Force® in the assembly



Buttons on the right allow the operator to return to the main balance screen, view details and plots, and change the data being viewed.

Touching “Show After ForceMatching” will change the 3D scene (matching up the chalk marks and showing the resulting Road Force® change in the color spectrum on the tire) as well as show the predicted resultant assembly force and diagnosis (upper left data).

Forcematching® - No Runout

If the operator accesses ForceMatching® without the required data having been measured, the screen will prompt the operator. A 180 match will need to be done if this happens.

Forcematching® - Show After Prediction

Touching the “Show After ForceMatching” button will change the 3D scene (matching up the chalk marks and showing the resulting Road Force® change in the color spectrum on the tire) as well as show the predicted resultant assembly force and diagnosis (upper left data).

ForceMatch® Procedures

To correct road force by using ForceMatch®: Rotate the tire Road Force® high spot on the wheel to TDC, or with the hood in the raised position and the servo enabled, touch “START.”

Mark the tire with a piece of chalk or a marker at TDC

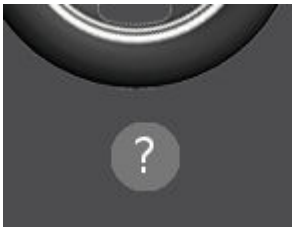
Rotate the rim low spot on the wheel to TDC, or with the hood in the raised position and the servo enabled, touch “START.” Mark the rim with a piece of chalk or a marker at TDC.

Use a tire changer and align the tire and rim marks to one another. Refer to the operation instructions for the tire changer in your shop.

NOTICE

If the wheel assembly can be corrected by Forcematching®, the results can be viewed prior to removing the assembly from the balancer by touching “Show After ForceMatching”. If the wheel assembly cannot be corrected by ForceMatching®, the diagnosis box will display “ForceMatching will not bring assembly within limits” and may suggest component replacement.

Touching the “?” button will display detailed information about the procedure



6.2.1. Match Codes

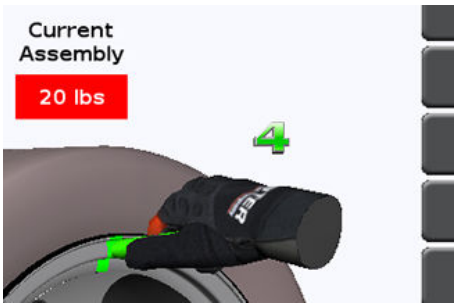
Match codes can be used to obtain optimal ForceMatch® results between multiple tire and rim assemblies. They are especially helpful when high Road Force® values are encountered. The former Hunter MatchMaker® feature used a similar system.

When a tire and rim assembly are balanced using ForceMatch®, a number (match code) is displayed above the tire.

This is the value of the high spot on the tire. It is an arbitrary number. The match code is 12.

When the tire and rim assembly is rotated to the low spot on the rim, a number (match code) is displayed above the tire.

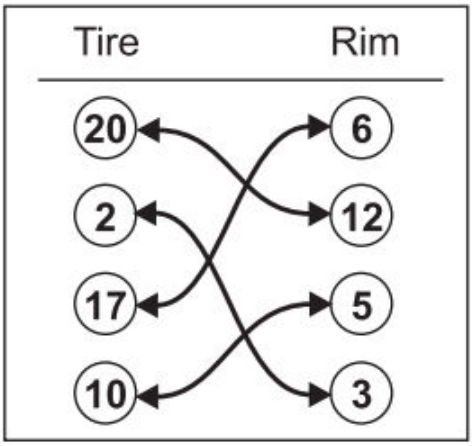
This is the value of the low spot on the rim. It is an arbitrary number. The match code is 4.



Use a tire changer and align the tire and rim marks to one another as performed in the standard ForceMatch® procedure.

By matching the highest tire match code value with the highest rim match code value, the Road Force® values can be reduced in a set of two or more tire and rim assemblies.

The diagram shows a set of four tires and rims and the best use of match codes to reduce Road Force® values.



A routine practice of marking the match code values on the tires and rims when using ForceMatching® can reduce the overall time needed to perform optimal ForceMatch® results.

180 Matching

180 Matching will minimize Road Force® in the tire and wheel assembly. It requires a tire changer, as the tire will be re-positioned about the wheel during the procedure.

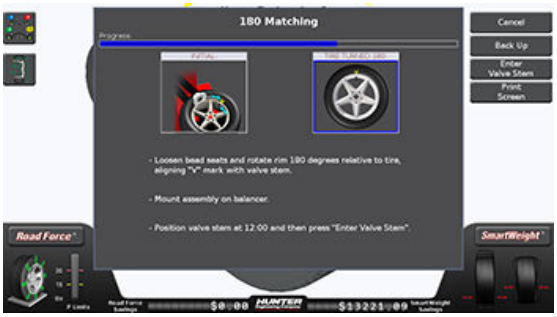
The 180 Matching procedure can be launched by touching the **“Road Force®” > “Procedures” > “180 Matching”** button.

The progress bar at the top of the screen indicates to the operator how far along the procedure has progressed. Mount the assembly on the balancer. Set the tire pressure to the vehicle manufacturer’s specification. Lower the hood to start the Road Force® measurement.

Position the valve stem at 12:00 and touch “Enter Valve Stem”.

Mark the tire with a piece of chalk or a marker with a “V” opposite the valve stem as indicated. Touch “OK” or tap the foot pedal when completed.

Use a tire changer and rotate the rim 180 degrees relative to the tire, aligning the “V” mark with the valve stem. Mount the assembly on the balancer. Position valve stem at 12:00 and press “Enter Valve Stem”.



Lower the hood to start the Road Force® measurement.

6.2.2. Encountering ForceMatch® Prediction Errors

Below are some reasons why the Road Force® Elite GSP9700 may not match or quantify the value of the tire or the assembly.

- **Incorrect Mechanical Wheel Mounting on the Shaft:** This can be caused from worn or damaged adaptors, rust or debris on the wheel, shaft, hub, adaptors, or a cone contacting a wheel on an irregular surface. Verify proper mounting by performing a centering check.
- **External Rim Measurement vs. Actual Bead Seat Measurement:** There is a high correlation between external and internal measurement, however the operator must consider each wheel design individually. Some cast or closed-faced wheels cannot be accurately measured externally. The tire must be removed for accurate bead seat runout measurements.
- **Air Pressure Readings Before and After Matching Differ:** The air pressure should remain constant between each measurement. Always inflate tires to the recommended pressure specified by the vehicle manufacturer.
- **Incorrect Tire Bead Seating Procedures:** Tire technology is always changing. Today’s vehicles 48 Balancing Procedures require the tire to be designed to tightly adhere to the wheel, preventing slippage between the two components. As a result, incorrect tire bead seating procedures are becoming more of an issue in solving vibration complaints.
  In many cases, a wheel will display high non-uniformity values because of increased tire bead interference, wheel design, or improper bead seating procedures. If the tire is re-loosened from the wheel and properly lubricated and remounted, the level of non-uniformity may decrease dramatically. On sensitive vehicles, sometimes there is benefit to slightly over-inflating the tire, deflating the air, and then re-inflating to optimize bead seating.
- **Insufficient Use of Tire Mounting Lube During Mounting:** “Lube is Good!” Proper lubrication on the tire bead and rim areas including bead seat, hump, balcony, and drop center are vital in achieving proper seating of the tire bead to the

wheel assembly. Aggressive acceleration or braking should be avoided for the first 500 miles to prevent tire to wheel slippage.

- **Rim Safety Hump Design 'Hangs Up' Tire Bead During Bead Seating:** Some types of wheels use a square safety hump that may further inhibit uniform tire bead seating. This further underscores the importance of proper lubrication and bead seating procedures.
- **Temporary Flat Spotting:** Flat spotting may occur when the tire is in one position for an extended period of time, such as a parked vehicle, improper storage of the tire, and temperature extremes. Measurements for force and balance will stabilize as soon as the tire is driven for a few miles. This important issue can also affect traditional wheel balancing procedures.
- **Excessive Lateral Runout of Tire and/or Rim:** A tire or wheel with high lateral readings may affect the predicted results of radial force after ForceMatching®.

6.2.3. Do's and Don'ts of Road Force Measurement

- Tires may need to be warmed up to remove temporary flat spots prior to testing.
- Tire inflation pressure must meet vehicle manufacturers specifications.
- Verify the wheel is centered.
- Use the approved adaptors for the Road Force® Elite GSP9700. Use approved wing nut provided and tighten with two hands to ensure full clamping force.
- The tire/wheel assembly must be free of debris.
- Bare rim runout measurements are required if the wheel design does not permit external measurement of the outer bead seat area.
- Use realistic Road Force® measurement limits for the vehicle being tested.
- If chosen limits have been exceeded, never use Road Force® measurement alone to replace a tire unless specified by the manufacturer.

6.2.4. Road Force® Savings

Savings generated through prevented comebacks using the Road Force® roller can also be viewed. Touch the Road Force® button.

In the Road Force® menu, touch the Show Savings button.

The Road Force® savings screen will be displayed.

6.3. StraightTrak Lateral Force Measurement (LFM)

StraightTrak® is an optional feature that corrects vehicle pull problems by suggesting that the tires be placed at specific locations on the vehicle. If the vehicle being tested has unidirectional tires, or different size tires front and rear, not all of the displayed options will be valid.

Performing a StraightTrak® LFM Procedure:

Mount the tire/wheel assembly centered on the shaft of the Road Force® Elite GSP9700. Use care to make sure the wing nut is well tightened.

Choose the appropriate balancing procedure for the particular type of rim construction.

Check the tire pressure. Inflation Station will automatically inflate or deflate the tire to the preset air pressure. When the tire pressure is correct, the tire graphic on the screen will turn green.

NOTICE
Lateral force varies significantly with tire inflation pressure. For accurate results, it is important that the inflation pressure for each tire is set to the correct value.

Enter rim dimensions by performing a spin. Press the green “START” button if “Hood Autostart” is disabled. After the radial measurements are taken, a lateral force sensor measures forces exerted in the lateral (axial) direction.

The drive system then reverses direction and again measures the forces exerted in the lateral (axial) direction. After wheel comes to a complete stop, raise the safety hood.

Perform any tire/wheel Force Matching® required to reduce radial Road Force® disturbances.

Apply the appropriate balance weight.

Touch the “Tire Stacking” tab button.

The screen will show the first wheel spun and automatically assign tag 1 to the assembly.

Attach the corresponding identifying tag to the valve stem of the tire/wheel assembly or number the assembly with a tire crayon.

The “Tire Stacking” tab can be opened or closed when performing the procedure. The HD® Elite will continue to automatically number the spun assemblies.

Touching the “Tire Stacking” tab button again will close the “Tire Stacking” tab window but automatic numbering will continue.

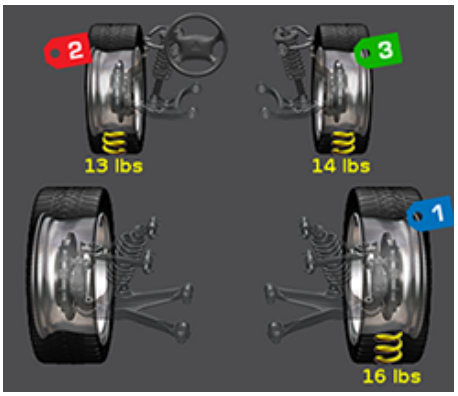
Mount the second tire/wheel assembly on the HD® Elite and perform ForceMatching® (if needed) and balancing. The screen will show the second wheel spun and automatically assign tag 2 to the assembly.

The vehicle plan view will show the net tire pull (if any) for the two measured tire/wheel assemblies.

Mount the third tire/wheel assembly on the RoadForce® Elite and perform ForceMatching® (if needed) and balancing. The screen will show the third wheel spun and automatically assign tag 3 to the assembly.

After tagging the third tire/wheel assembly, the vehicle plan view will show suggested placement of the tire/ wheel assemblies so that the net lateral force, produced by tire conicity, exerted on the steer axle of the vehicle is minimized.

Mount the fourth tire/wheel assembly on the RoadForce® Elite (if needed) and balancing.



The screen will show the fourth wheel spun and automatically assign tag 4 to the assembly.

After tagging the fourth tire/wheel assembly, the vehicle plan view will show suggested placement of the tire/ wheel assemblies so that the net lateral force, produced by tire conicity, exerted on the steer axle of the vehicle is minimized.

It will also show net pull (if any). Various choices of tire placement may be chosen to optimize the vehicle for least pull and/or least vibration. Touch the buttons on the right to cycle through various options showing or hiding “Road Force®”, “Show Least Pull”, “Show Least Vibration” and “Print” results.

6.3.1. Disabling StraightTrak®

Any instance when lateral force is not an issue (such as when measuring single assemblies), StraightTrak® can be turned “OFF” to reduce cycle time.

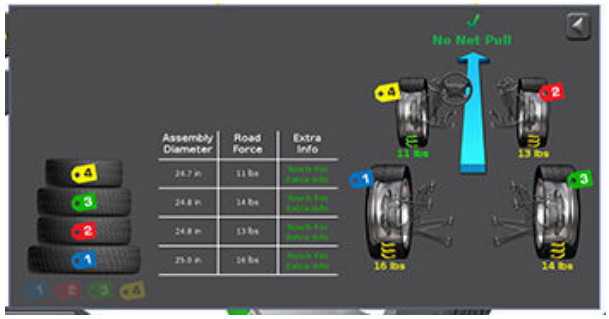
StraightTrak® can be disabled by touching the load roller on the screen until the StraightTrak® logo is no longer visible.

6.3.2. Interpreting the Tire Stack

1. Spin has been performed. Tire imbalance has been measured but not corrected. Tire is still in process.
2. Tire has been balanced, but neither Road Force, nor lateral force has been measured.
3. Imbalance was measured but not corrected Tire has been forced to the tire stack by the technician.
4. Tire has been balanced and Road Force has been measured, but lateral force has not been measured.
5. Tire has been balanced, Road Force has been measured, and lateral force has been measured.
6. Tire has been balanced, Road Force has been measured, and individual lateral force has been measured.

Vehicle Plan View The vehicle plan view provides a graphic depiction of the information that is gathered by the Road Force® Elite GSP9700 during a loaded spin.

Touching the “Tire Stacking” tab button shows the vehicle plan view in a simplified form. It shows only the net pull on the assembly after having spun four assemblies.



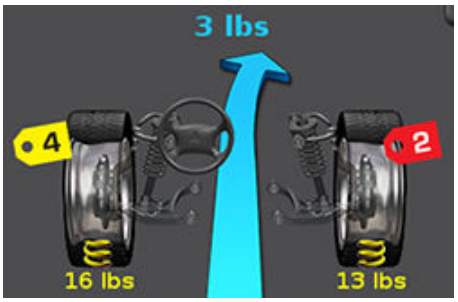
The vehicle plan can be expanded to show individual Road Force® measurements, individual lateral force measurements, assembly diameters and other pieces of information about measured assemblies.

To access this expanded plan view, touch the arrow button at the top right of the plan view. To return to the simple plan view, touch the arrow button again.

6.3.3. Net Tire Pull

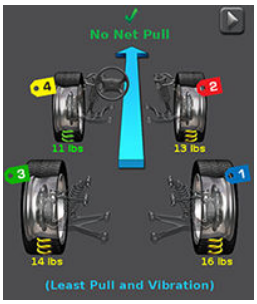
Net pull indicates the direction and the magnitude of pull, due to the tires, that the vehicle will be subject to, if the tire/wheel assemblies are mounted on the vehicle as currently shown on the screen.

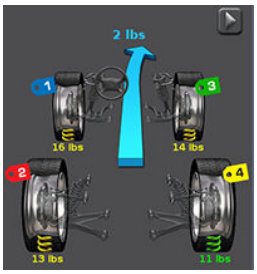
Direction will be to the right, or to the left, indicated by an arrow. Magnitude is measured in pounds (lbs) or Newtons (N) and is further indicated by the directional arrow.

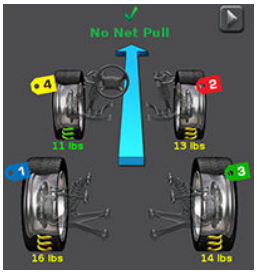


CHANGING TAG NUMBERS

While on a vehicle plan view screen, touching and “dragging” tags will show the effects of changing assembly locations.







When the first tire/wheel assembly is ready to be tagged, the only option will be to tag it as tag 1. The second tire/ wheel assembly will default to tag 2, however you may change it to tag 1 dragging and dropping the tag to the second location. The third and fourth tire/wheel assemblies may be tagged by accepting the default (the next sequential tag).

FORCING A TIRE ONTO THE TIRE STACK

In some cases, it may be desirable to "force" a tire to the tire stack even though it has not been balanced. Touch the chassis tab.

Observe the current tire stack.

NOTICE
In this example, no wheels have been balanced or previous data has been cleared.

Locate weight locations / input rim dimensions by performing a balance spin.

NOTICE
Wheel has been balance spun but no weights have been applied.

Touch the chassis tab. A semi-transparent tire appears on the stack.

NOTICE
Since this wheel has not been balanced, a “Not Balanced” icon appears on the left edge of the semi-transparent tire.

Touch the “Save to Tire Stack” button. The tire is now solid but the “Not Balanced” icon indicates that no corrective weights have been applied.

REMOVING A TIRE FROM THE STACK

Touch and hold your finger on the tire you wish to remove. A trash can icon will appear at the center of the screen. Without lifting your finger from the screen, drag the tire to the trash can and release the tire.

A prompt will ask you, “Are you sure you want to remove this tire from the stack?” Select “OK” to continue, or “Cancel” to cancel.

ROAD FORCE®

Touching the “Hide Road Force” button will turn off the Road Force® listings for all assemblies. Touching the “Show Road Force” button will turn Road Force® listings back on. Road Force® indicates the amount of vertical (radial) Road Force® variation remaining in the tire/wheel assembly after ForceMatching®.

Magnitude is measured in pounds (lbs), Newtons (N), or kilograms (kg). To minimize vibration, the tire/wheel assembly with the largest amount of Road Force® is typically positioned farthest away from the driver (right rear). Even though the front (steer) axle tires may be switched to change the direction of net pull, the rear tire/wheel assembly with the largest amount of Road Force® will still be positioned farthest away from the driver.

SHOW LEAST PULL

Touching the “Show Least Pull” button will rearrange the tags to show the least pull. By touching “Show Least Pull,” the placement of tire/ wheel assemblies on the vehicle that will yield the least net tire pull will be shown. This positioning tries to place the two tire/wheel assemblies on the front axle that have the same amount of pull, but in opposite directions when on the vehicle.

SHOW LEAST VIBRATION

Touching the “Show Least Vibration” button will rearrange the tags to show the least vibration. By touching “Show Least Vibration,” the placement of tire/wheel assemblies on the vehicle that will yield the least vibration will be shown.

This positioning will place the tire/wheel assembly with the greatest amount of Road Force® on the passenger side of the rear axle (farthest from the driver). The tire/wheel assembly with the second highest Road Force® will be placed on the

driver's side of the rear axle, and the tire/wheel assembly with the lowest Road Force® will be placed on the driver's side of the front axle.

6.3.4. Printout

Touching the "Print" button will allow the operator to print summary information.

By printing the summary, the operator has a printed reminder of where to position each tire/wheel assembly on the vehicle to minimize the effects of lateral force.

If the desired results are not evident during a test drive, the operator may refer to the alternate placements shown on the printout, without the need to repeat the entire procedure.

The printout can be used to explain the effects of lateral force and the steps taken to reduce their adverse effect to the customer.

Touching the "Vehicle Summary" button opens the Vehicle Summary screen. Custom vehicle summaries can be created by selecting the items to include in the printout.

When a custom summary is created, it can be saved by touching the "Save This Option Set" button. Custom vehicle summaries can be recalled by touching the "Recall Next Option Set" button. Print information can also be entered in the text boxes on the Vehicle Summary screen.

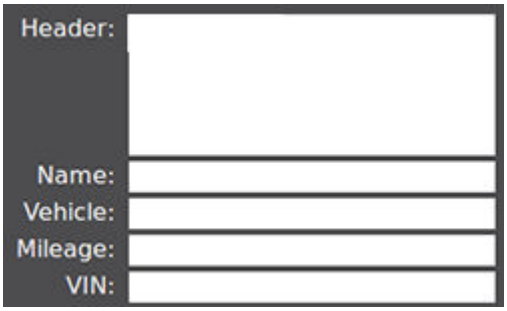
Use "Header:" to display shop name, address, and phone, or any custom message to appear on the printout.

Use "Name:" to display the customers name.

Use "Vehicle:" to display the vehicle being serviced.

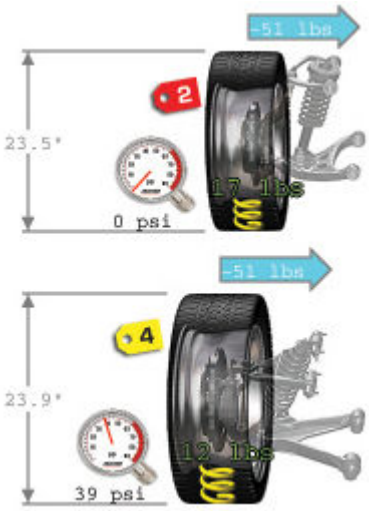
Use "Mileage:" to display the vehicle mileage.

Use "VIN:" to display the vehicle identification number.



Touching in any text field will launch the on-screen keyboard. Use the on-screen keyboard to type in the desired fields.

6.3.5. Inflation Pressure & Extra Info



Inflation pressure of each tire, as recorded by the Inflation Station, is displayed on the summary printout. A blank reading indicates that the tire was not measured (inflated or deflated) with the Inflation Station feature.

Summary printout will print the tire pressure rounded to the nearest tenth of a pound. The range allowable to fill each tire may vary on the printout by one or two pounds per assembly. This is considered normal due to the “green bar” tolerance allowable during automatic inflation.

Extra Info

When viewing the extended plan view, detailed information about each assembly may be viewed by touching “Touch For Extra Info”.

Information such as corrective weight amounts used and individual assembly lateral force will be displayed. Touch “Touch To Close” to close the Extra Info panel.

6.4. Individual Lateral Force Measurement

Lateral force can be measured on individual tire/wheel assemblies.

The Individual Lateral Force Measurement procedure can be launched by touching the **“Road Force®” > “Procedures” > “Measure ILF”** button. The progress bar at the top of the screen indicates to the operator how far along the procedure has progressed.

Mount the assembly on the balancer. Set the tire pressure to the vehicle manufacturer’s specification. Lower the hood to start the Road Force® measurement.

The first spin will be recorded as spin 1. Use a tire changer and remove the tire from the wheel. Flip the tire over and remount the tire to the wheel.

Set the tire pressure to the vehicle manufacturer’s specification.

Mount the assembly on the balancer. Lower the hood to start the Road Force® measurement.

The second spin will be recorded as spin 2.

After the assembly is spun, Individual Lateral Force is measured and saved.

Use a tire changer and remove the tire from the wheel.

Flip the tire over and remount the tire to the wheel.

Set the tire pressure to the vehicle manufacturer's specification. Mount the assembly on the balancer.

Touch **"OK"** to return to the balance screen, then balance the assembly.

The Individual Lateral Force measurement results may be viewed by touching the **"Tire Stacking"** tab button.

To calculate Individual Lateral Force, use the following formula:

Net pull / 2 = Individual Lateral Force

Example: 6 lbs / 2 = 3 lbs Individual Lateral Force.

6.4.1. Road Force Savings

Savings generated through prevented comebacks using the Road Force® roller can also be viewed.

Touch the Road Force® button. In the Road Force® menu, touch the Show Savings button.

The Road Force® savings screen will be displayed.

7. Optional Balancer Procedures

7.1. Tools

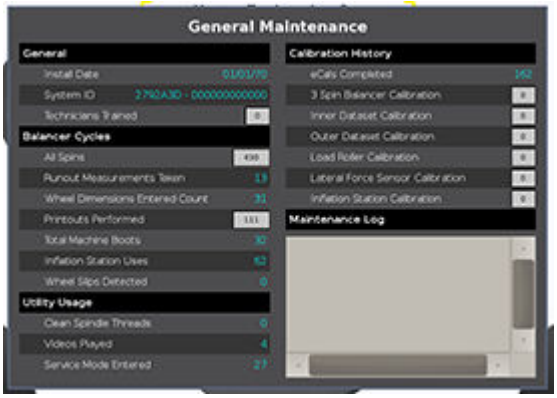
The Tools button contains equipment information and set up options.

Set Up

The **“Set Up”** screen contains a list box of balancer set up items. Select the item you wish to set up and follow the on screen prompts.

Maintenance History

From the main balance screen, touch the **“Tools” > “Advanced” > “Maintenance History”** button.



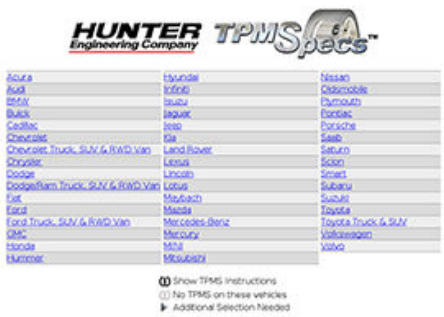
The Maintenance screen displays general balancer history. Pressing any of the grey boxes will show a flyout with more information.

TPMS

From the main balance screen, touch the **“Tools” > “TPMS”** buttons.

The main TPMSpecs® screen is displayed. Select the make, model and specifics of the vehicle being serviced.

Make



Model

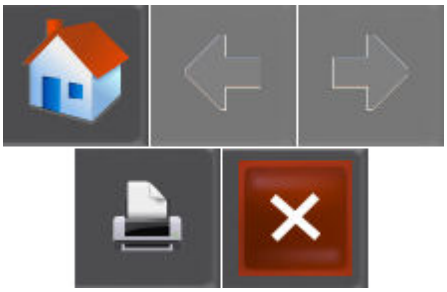
Specifics

The “AT A GLANCE” overview starts each vehicle TPMS specification. The first image shows the type of TPMS sensor on the vehicle. The following three images show the requirements for servicing the wheel: process, scan tool and OEM scanner.

The red border, yellow border or grayed appearance of the image denotes the requirement as required, optional or not required. Red and white striped border indicates the requirement is possibly required; refer to the explanation below the images.

Scroll up or down by dragging the scroll bar, or touching the **“up”** and **“down”** arrows on the right side of the screen. Touch the **“Home”** button to return to the main TPMSpecs® Menu.

Touch the **“arrows”** to navigate backward or forward. Touch the **“print”** button to print the current page. Touch **“X”** to return to the balancer screen.



Clean Threads

From the main balance screen, touch the **“Tools” > “Clean Threads”** buttons. The main Clean Threads Explanation screen is displayed.

Follow the on-screen instructions to clean the spindle threads. After the spindle threads are cleaned, touch the **“Exit”** button to return to the main balance screen.

Balance Bare Rim

From the main balance screen, touch the **“Tools” > “Balance Bare Rim”** buttons. The balance screen is displayed with a bare rim. During bare rim balancing, the load roller is disabled.

Balance the rim as normal, taking dimensions, applying weights, etc. Touch the **“Balance Rim With Tire”** button to return to standard balancing.

8. Maintenance

8.1. Calibration Procedures

eCal™ Auto-Calibration

The HD® Elite utilizes eCal™ automatic calibration. Once the balancer is calibrated at installation time, no further operator input is required.

Calibration Check

A quick calibration check can be performed on the balancer using a calibration weight. From the main balance screen, touch the **“Tools” > “Quick Calibration Check”** buttons.

Screw in the calibration weight and clamp a large cone or collet to the shaft. Lower the hood and press start to begin the check.

Rotate the shaft to the 12:00 position until the yellow dot on the screen turns green to complete the check.

8.2. Cleaning the Console

Safety Instructions

- Please keep the display away from any heat sources such as electric radiators or direct sunlight. Place the display in a stable and well-ventilated place.
- The holes or openings on the display are designed for ventilation. Do not cover or block the ventilation holes or openings with any objects.
- As the display surface is vulnerable to scratches, avoid touching the surface with nail or pen point.
- Do not attempt to repair this product yourself! Improperly disassembly of the product may expose you to danger! If your problem cannot be solved according to the “Troubleshooting” guidelines, contact your regional HP authorized service provider, *https://support.hp.com/us-en*.

Optical Scan Rim Measurement Maintenance or Service

This Laser Product is designated as a Class 3R Laser during all procedures of operation. Never look directly into the laser. Doing so may cause serious injury. Do not intentionally use a reflective device to enhance or re-direct the laser. Do not operate the laser if the cover or seal is damaged.

There is no required maintenance or service to keep the Optical Scan Rim Measurement Laser System in compliance. The laser is not a field serviceable part or an adjustable part. Any necessary repair or maintenance should be done by the factory only. The Optical Scan Rim Measurement Laser System has no field serviceable parts. The unit should never be opened or modified.

Optional HammerHead® TDC Laser Clip-On Weight Locator Maintenance or Service

> **CAUTION**
> Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

This Laser Product is designated as Class 2M during all procedures of operation. Do not stare into the beam or view directly with optical instruments. Doing so may cause serious injury.

Do not intentionally use a reflective device to enhance or re-direct the laser. Do not operate the laser if the cover or seal is damaged. There is no required maintenance or service to keep the HammerHead® TDC Laser System in compliance. The laser is not a field serviceable or an adjustable part.

Any necessary repair or maintenance should be done by the factory only. The HammerHead® TDC Laser System has no field serviceable parts.

8.3. Cleaning and Lubricating the Adjustable Flange Plate and Pin

Cleaning and Lubricating the Adjustable Flange Plate

> **CAUTION**
> DO NOT pry or hammer stuck pins from adjustable flange plate. The tab at end of pin is made of mild steel that can be deformed by excessive force. Disassemble adjustable flange plate as described below to remove stuck pins and diagnose problem.

> **NOTICE**
> If adjust ability of flange plate becomes difficult, clean and lubricate the plate.

1. Use a standard screwdriver to pry retaining spring, 98-405-2, from the backside of adjustable flange plate.
   Remove the thumbscrew through the side of the flange plate as follows:
   Open and then remove the split retaining ring from the thumbscrew, 75-651-1. Unscrew the thumbscrew from the flange plate.
2. Clean grease and grime from hub and guide. Apply light machine oil or light grease to the mating surfaces (including around the slots on the interior surfaces of both the hub and guide).
3. Secure the guide to hub with retaining spring previously removed. Secure the thumbscrew to the flange plate with the split retaining ring.

Pin Assembly Maintenance

Replace tab, 218-185-2, as follows:

Remove pin guide, 135-377-2, from end of the pin assembly and remove the old tab. On one side on the tab the edges are rounded and the other side has sharp edges. Install the new tab with the rounded edges toward the collar, 217-54-2, of the pin assembly.

Match the flat section on the mating surfaces of tab and collar. If a flat washer was located between the tab and pin guide, reassembly the pin assembly with this washer in place. Using Loctite 222 on the threads, secure the tab with the pin guide.

Springs, 98-403-2, must be installed with the concave sides facing each other. When correct, only the outer edges of the springs will contact each other, creating a clam appearance. All the pin assemblies must have the springs installed consistently in this manner.

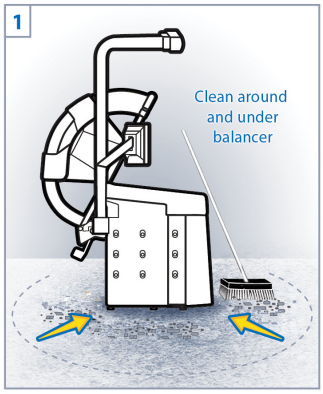
If the installation and removal of pin sleeves becomes difficult, clean inside of pin sleeves and the pin assemblies, and then apply light machine oil to the mating surfaces. If pin sleeves do not stay on pins, clean excess oil from inside of pin sleeves and the pin assemblies. If the problem persists, replace the two O rings, 124-149-2, on the ends

8.4. Maintenance Schedule

HUNTER Engineering Company

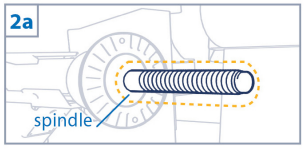
Wheel Balancer - Daily Maintenance

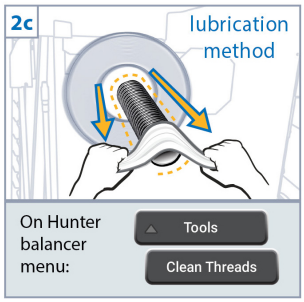
1 **Clean around and under balancer.** Clear all loose weights from floor.



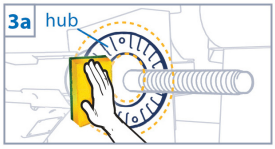
Wheel weights under balancer may cause weight chasing.

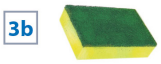
2 **Clean and lube spindle.** Apply 3-in-1 oil to a rag. *(Keep oil from skin.)* Use **"Clean Threads"** feature to rotate.





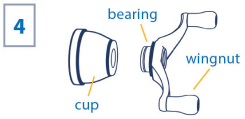
3 **Clean hub face by hand** with Scotch Brite pad. **Do not lube this surface!**





Dry scrub by hand to prevent hub damage. Do not use power tools. **Do NOT use "Clean Threads" to clean hub.**

4 **Inspect wing-nut and cup.** Gritty bearings, broken knobs and missing handle spacers may cause balance issues.



5 **Perform 3 Spin Balancer Calibration.**

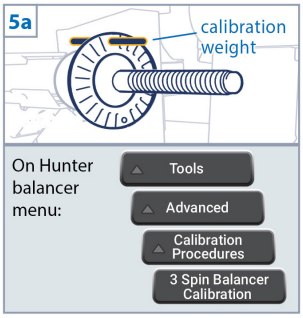


Table 2. Follow schedule to keep balancer performing at its best

Maintenance Schedule	Perform the following Maintenance
Daily	• Spindle Maintenance - Keep the spindle shaft assembly and wing nut threads clean and lubricated. Clean the spindle threads by running the edge of a rag between the threads while turning the spindle by hand. Lubricate the shaft with a coating of light lubricant with Teflon® such as Super Lube® by Loctite after cleaning. Do not lubricate the spindle hub face-mounting surface. This could cause slipping between the wheel and the hub face. Keep the hub face-mounting surface clean and dry. • Collet maintenance - Keep the mounting collets clean and lubricated. Lubricate with a coating of light lubricant with Teflon® such as Super Lube® by Loctite. Inspect cones for excess wear, dings, burrs, or other damage that may prohibit proper centering. Do not use cones in any way that is not described in the operation manual. This could cause damage to the mounting cone and not allow for proper mounting of the wheel. • Inspect wingnut and clamp cup for excessive wear or damage. • Cleaning the console - When cleaning the console use the included Armor All Glass wipes to wipe off the display console and cabinet. Do not spray any type of cleaning solution directly onto control panel or LCD resistive touch screen. Do not use shop air to clean the display. Power should be off prior to cleaning the LCD resistive touch screen
Periodically (when balancer chases weight on check spin)	• Perform a QuickCal Check to determine if calibration is necessary. This should be performed after balancer has been in operation for at least 10 minutes.
Monthly	• Inspect inlet air filter/dryer - clean, replace as necessary
Semi-Annually	Preventative maintenance visit by Hunter Service Representative which will include all the above in addition to the following: • Perform audit check (quality report for vibration control system) • Perform full system diagnostics (including air system) • Load roller friction material inspection • Check printer operation • Cone inspection with dial indicator • Check belt tension • Full system calibration

NOTICE
The end user is responsible for replacement of all consumable items such as printer ink cartridges, cleaning wipes, and batteries.

CAUTION
Do not use shop air to clean the LCD resistive touch screen. Shop air could be wet, dirty, or too powerful for the display and can cause problems with the display.

9. Warranty Information

Hunter Engineering Company warrants new equipment to be free from defects in material and workmanship under normal conditions of use for a period of three (3) years from the date of installation. Exceptions to this warranty are listed below:

- Field labor is covered under this warranty for a period of six (6) months.
- ADASLinkTM units carry a one (1) year warranty and remain under warranty as long as a subscription is maintained there after.
- DAS 3000 units, including electronic circuit boards, carry a one (1) year warranty.
- Printers carry a one (1) year warranty.
- Normal consumables and wear items are not covered. Exception is batteries, which are warranted for a period of six (6) months.
- Product that has been subject to abuse, misuse, alterations, accident, exposure to the elements, tampering, unreasonable use, or not maintained in a reasonable or necessary manner.
- Replacement parts purchased through the Hunter Service Center and no longer covered by machine warranty are warranted for a period of six (6) months.

In case of any warranty claim, it will be necessary to contact your local authorized Hunter Service Representative. To have an item considered for warranty, it must be returned to Hunter Engineering Company for inspection and evaluation. This must be done on a freight prepaid basis. If after our inspection the product proves to be defective, and is within the time frame specified, we will repair or replace the item at no additional cost.

This is Hunter Engineering Company's only warranty with respect to new equipment. Hunter Engineering Company disclaims all other warranties to the extent permitted by law. This express warranty and any implied warranties of merchantability and fitness for a particular purpose shall not extend beyond the warranty period. Hunter Engineering Company is not responsible for any incidental or consequential damages, including, but not limited to, loss of business.

We do not authorize any person to assume for us any other liabilities with our products. Any remaining warranty may be transferred to subsequent purchasers by forwarding the purchaser's name, address, phone number and equipment serial number to:

See our document library at *www.Hunter.com* for additional details.

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