TOOL USE INSTRUCTION

RIVIAN		
	TOOL NUMBER	TSN00456-100-A
	TITLE	Hunter Road Force Elite Balancer
	REV - DATE	REV A - 01/15/2026

CONTENTS

TOOL FUNCTION

Used to perform balancing of the wheel/tire assembly before installation onto the vehicle.

WARNING

Do not perform procedure if tool is damaged or missing parts. Consult the Rivian Service Tool Catalog for replacement components.

Failure to follow guidelines outlined in this document could result in injury and/or property damage.

SAFETY GUIDELINES

1	**PPE REQUIRED** • eye protection • closed toe shoes • gloves • ear protection	
2	**CAUTION** Risk of Pinch Point • keep hands and fingers clear of all moving parts.	
3	**WARNING** Risk of minor injury	

SPECIFICATIONS

Weight: 500 lbs
Voltage Rating: 230VAC/ 10 amps

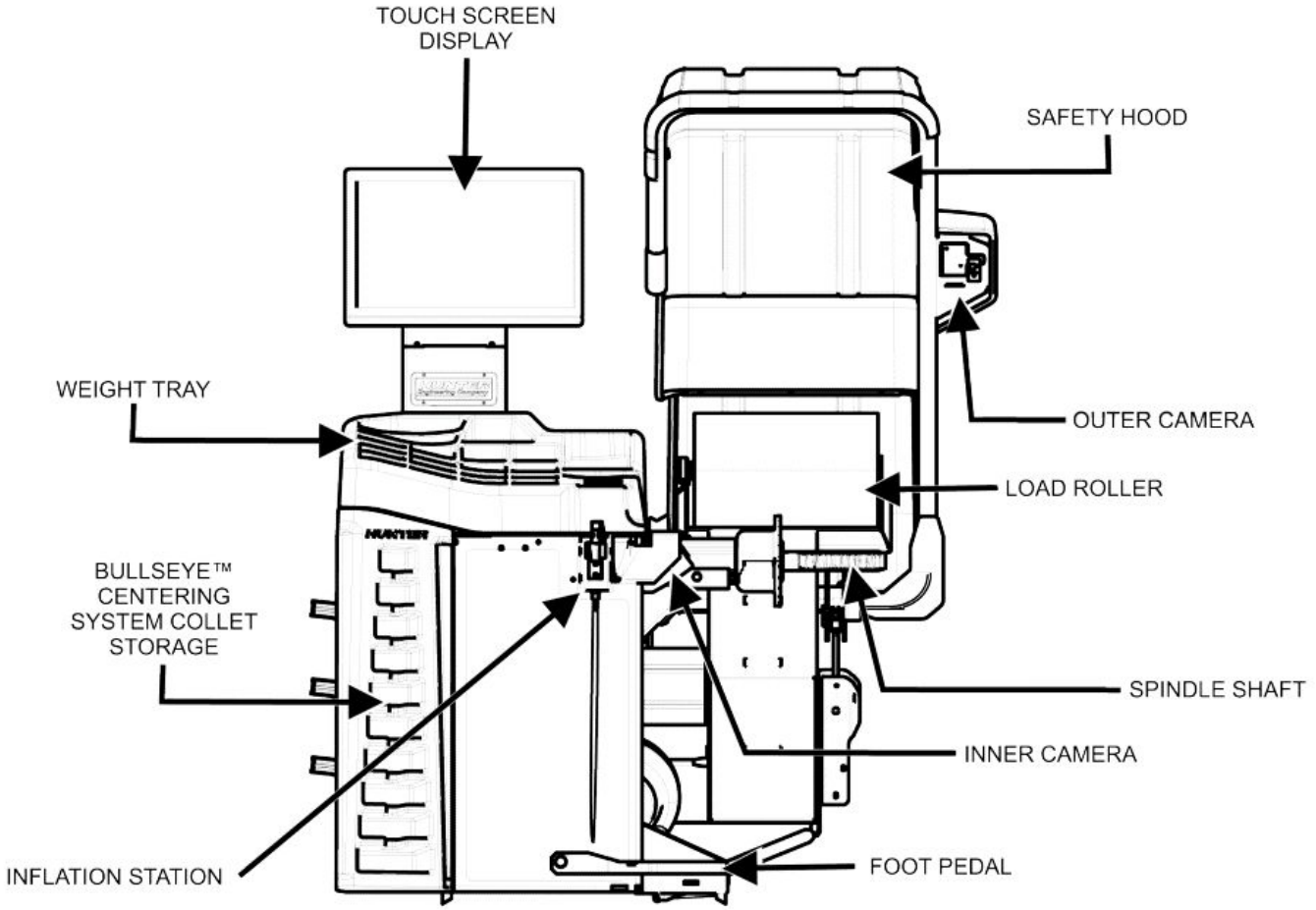
LABOR CODES

220012017 Tire Rotation and Rebalancing, 4 Tires
220012517 Tire Rotation and Rebalancing, 5 Tires

OTHER TOOLS REQUIRED

TSN00438-100-A Wheel Weight Cutter

Balancer Components:



Main Screen Components:

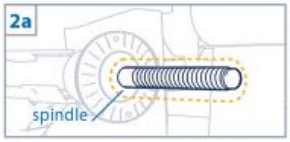
1. Tire Stack / Vehicle Plan View Tab	10. SmartWeight® Savings Odometer
2. Load Roller	11. Road Force® Savings Odometer
3. Clip Weight Plane	12. Road Force® Limits Display
4. Tape Weight Plane	13. Road Force® Wheel Assembly Display
5. Context Sensitive Menu	14. Road Force® Menu Button
6. Wheel Assembly 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	

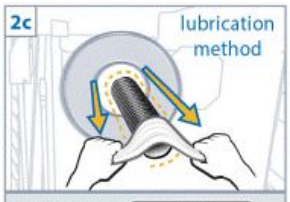
Daily Maintenance prior to using the Balancer:

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.





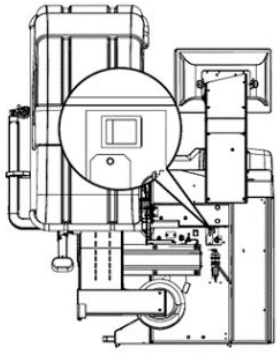
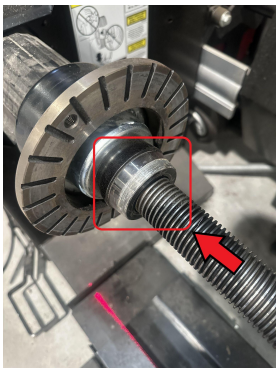
On Hunter balancer menu: Tools → Clean Threads

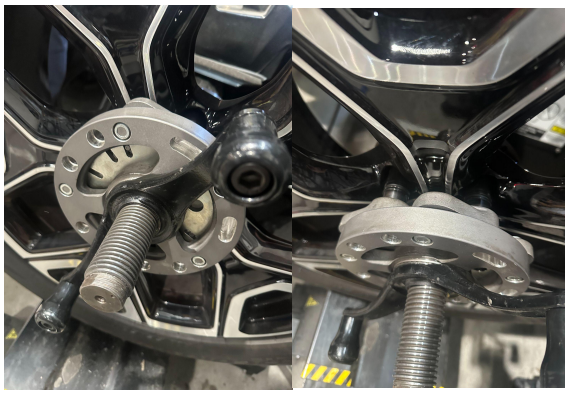
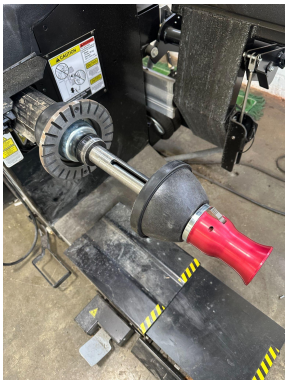
3 **Clean hub face by hand** with Scotch Brite pad. **Do not lube this surface!**

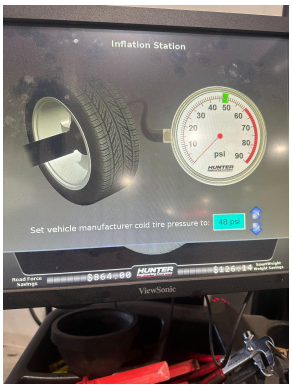
Dry scrub by hand to prevent hub damage. Do not use power tools. **Do NOT use "Clean Threads" to clean hub.**

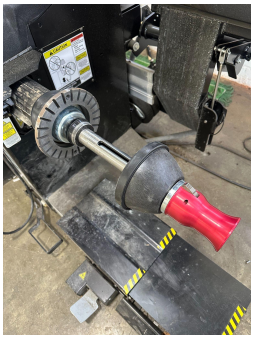
4 **Inspect wing-nut and cup.** Gritty bearings, broken knobs and missing handle spacers may cause balance issues.

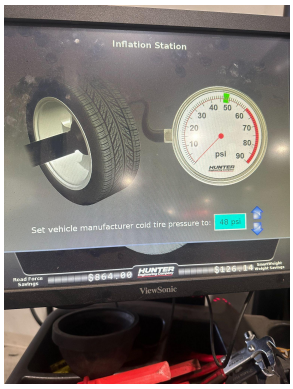
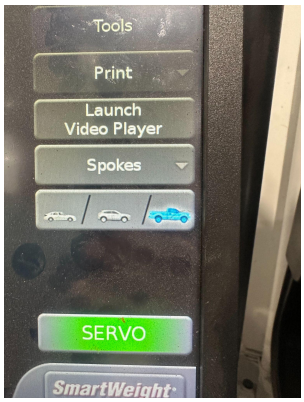
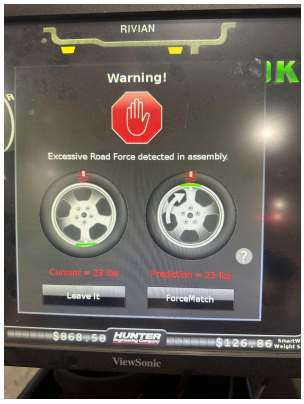
5 **Perform 3 Spin Balancer Calibration.**

1	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	
2	Perform daily Maintenance steps	See PAGE 5 on **Initial Setup**
3	Identifying the correct centering collar to properly position the wheel on the balancer is used	 
4	Use the tire lift feature and mount the tire onto the spindle shaft.	

5	The wheel/tire assembly is properly secured to the balancer with the correct lug centering adapter	
6	You can also use the Quick clamp feature if your Balancer is equipped with it.	
7	**RIVIAN** is selected for the vehicle make and the location of the weights are located on the inside of the wheel using stick on weights (for passenger vehicles) or outside of the wheels with clip on weights (commercial vehicles).	
8	Set the balancer to utilize the load roller to perform a Road Force only balance or a Road Force with Straight Trak by tapping on the roller on the screen and selecting the description. **Road Force selection shown**	

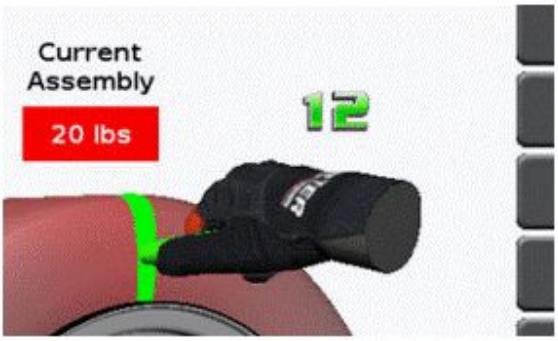
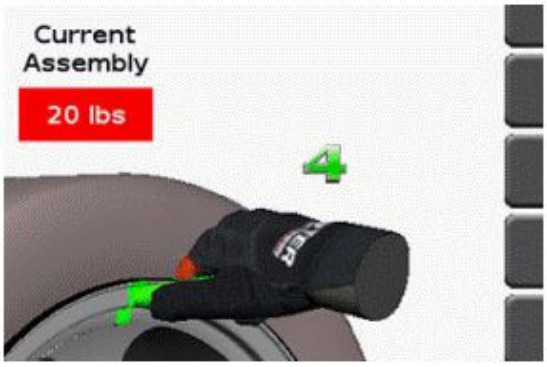
9	**Road Force with StraightTrak shown**	
10	Be sure to set the tire pressure to the manufacturer specifications before starting the Road Force/ Balancing process on the wheel/tire assembly .	
11	Select the correct tire configuration to ensure values are correct when measuring the loads on the tire.	
12	**ALWAYS REMOVE** the old weights on the rim prior to performing a Road Force balance/ StarightTrak prediction. That way you can start off with an accurate measurement of the wheel/tire assembly and add weights according to the machine guidance.	

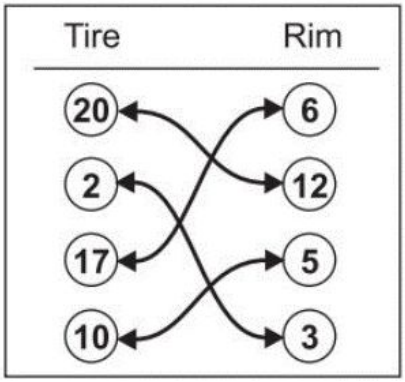
1	Setup the machine for RIVIAN vehicles and the proper location on where you want the weights to be installed (inside stick weights for consumer vehicle, outside for commercial vehicles	
2	Select **ROADFORCE** for the Load roller	
3	Mount the wheel/tire assembly to the balancer, inflate to the manufacturer tire pressure and **BE SURE** to remove the old weights	
4	Use either the Adjustable Balancer Flange or the Quick clamp feature to secure the wheel (use the appropriate centering collar as highlighted in the Initial setup)	 

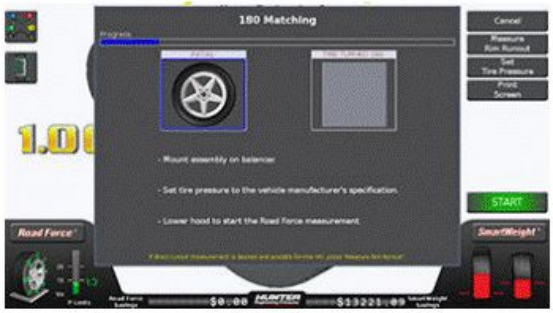
5	Be sure to set the tire pressure to the manufacturer specifications before starting the Road Force/ Balancing process on the wheel/tire assembly	
6	Be sure to select the correct vehicle configuration	
7	Select START and perform RoadForce balance on wheel assembly (automated)	
8	Ideal is to have a value < 36 lbs (for all tires). Replace tire if it is not possible to go underneath the ideal values	

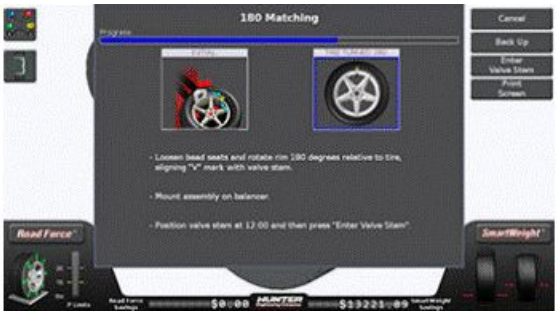
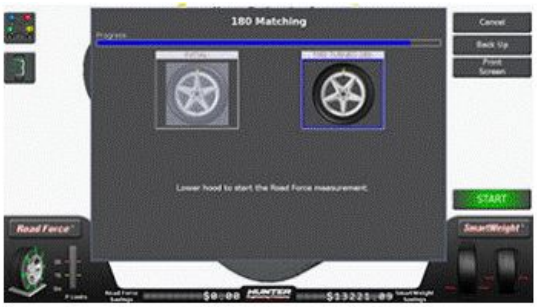
9	The Road Force values is also displayed on the bottom left of the screen with a marking on the tire of location.	
10	If excessive force is detected refer to **FORCE MATCH** instructions (Page 12)	

1	If the tire needs to be rotated to address excessive force, you will be given the option to Force Match the tire	
2	The display on the left side will give you a Road Force prediction if you dismount the tire and reposition it on the wheel. It will target a lower value.	
3	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.	
4	**IF NEEDED:** Dismount the tire, reposition it on the wheel and retest again once the tire is in the ideal position to see if it meets the target specs You can also use Force match codes to better position the tire to the rim	

5	Match codes can be used to obtain optimal Force Match® results between multiple tire and rim assemblies. They are especially helpful when high Road Force® values are encountered.	
6	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.	
7	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.	
8	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.	

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

1	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.	
2	The 180 Matching procedure can be launched by touching the “**Road Force®**” > “**Procedures**” > “**180 Matching**” button.	
3	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.	

1	Position the valve stem at 12:00 and touch “**Enter Valve Stem**”.	
2	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.	
3	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**”.	
4	Lower the hood to start the Road Force® measurement.	

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

Issue	Cause
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.

Issue	Cause
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.

Issue	Cause
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®.

• 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.

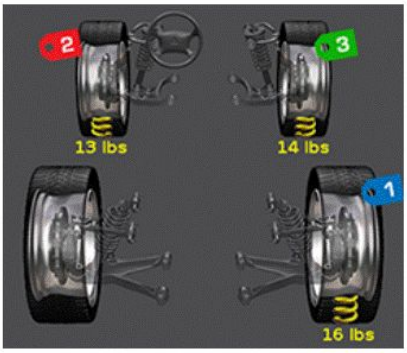
• Bare rim runout measurements are required if the wheel design does not permit external measurement of the outer bead seat area.

• 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

1	Perform any tire/wheel Force Matching® required to reduce radial Road Force® disturbances. Apply the appropriate balance weight. Touch the "**Tire Stacking**" tab button.	
2	The screen will show the first wheel spun and automatically assign tag 1 to the assembly.	
3	Attach the corresponding identifying tag to the valve stem of the tire/ wheel assembly or number the assembly with a tire crayon.	
4	The "**Tire Stacking**" tab can be opened or closed when performing the procedure. The HD® Elite will continue to automatically number the spun assemblies.	

1	Touching the "**Tire Stacking**" tab button again will close the "Tire Stacking" tab window but automatic numbering will continue.	
2	Mount the second tire/wheel assembly on the HD® Elite and perform **Force Matching**® (if needed) and balancing. The screen will show the second wheel spun and automatically assign tag 2 to the assembly.	
3	The vehicle plan view will show the net tire pull (if any) for the two measured tire/wheel assemblies.	
4	Mount the third tire/wheel assembly on the Road Force® Elite and perform Force Matching® (if needed) and balancing. The screen will show the third wheel spun and automatically assign tag 3 to the assembly.	

1	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.	
2	Mount the fourth tire/wheel assembly on the Road Force® Elite (if needed) and balancing	
3	The screen will show the fourth wheel spun and automatically assign tag 4 to the assembly.	
4	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.	

1	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.	
2	Disabling StraightTrak®	
3	Any instance when lateral force is not an issue (such as when measuring single assemblies), Straight Trak® can be turned “**OFF**” to reduce cycle time. Straight Trak® can be disabled by touching the load roller on the screen until the Straight Trak® logo is no longer visible.	

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.

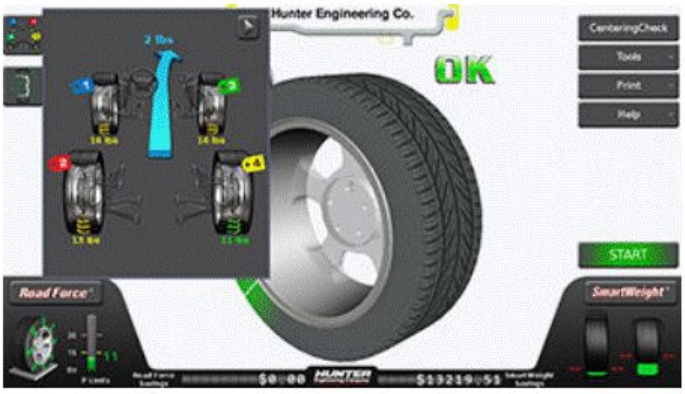
3. Imbalance was measured but not corrected Tire has been forced to the tire stack by the technician.

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.

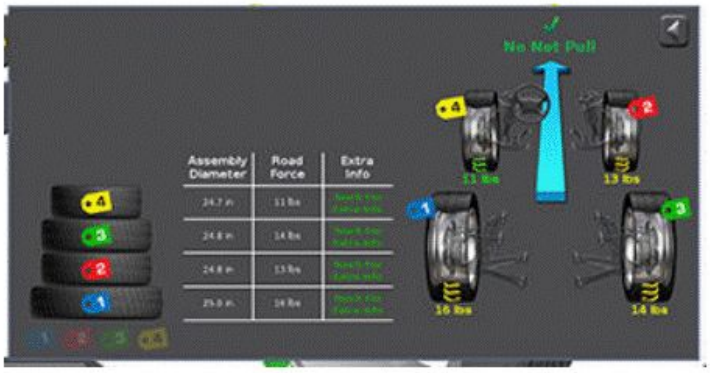
6. Tire has been balanced, Road Force has been measured, and individual lateral force has been measured.

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.

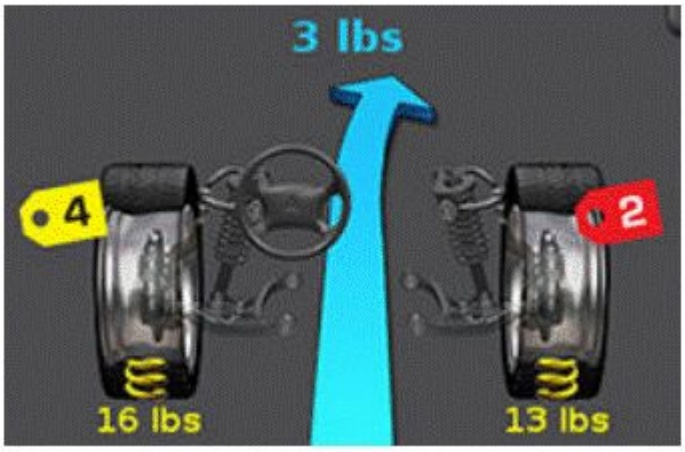


Net Tire Pull

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.

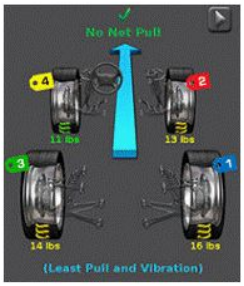
Direction will be to the right, or to the left, indicated by an arrow.

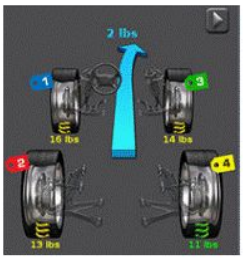
Magnitude is measured in pounds (lbs) or Newtons (N) and is further indicated by the directional arrow.

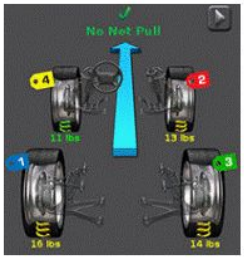


CHANGING TAG NUMBERS

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).

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 Force Matching®.

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.

BASIC MAINTENANCE GUIDE

TASK	FREQUENCY
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.	Daily
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	Daily

BASIC MAINTENANCE GUIDE

TASK	FREQUENCY
Inspect wingnut and clamp cup for excessive wear or damage.	Daily
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	Daily
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.	Periodically
Inspect inlet air filter/dryer - clean, replace as necessary	Monthly

BASIC MAINTENANCE GUIDE

TASK	FREQUENCY
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	Semi-Annually

FOR OTHER ITEMS NOT SHOWN, CONTACT RIVIAN SERVICE TOOL ENGINEERING

ITEM	DESCRIPTION	SUPPLIER + PART NUMBER	PHOTO
1	Hunter Adjuster Balancer Flange Plate	Hunter 20-3698-1	

DANGER

Risk of electrocution or electric shock

WARNING

Risk of minor injury

DANGER

Risk of major injury such as

- fire
- chemical or poison
- crushing / maiming
- death

CAUTION

Risk of

- damage to vehicle or property
- data disruption
- voiding warranty

CAUTION

Risk of Pinch Point

- keep hands and fingers clear of all moving parts.

PPE REQUIRED

IMPORTANT

Instructions to successfully complete a task

NOTE

Useful information

REV	DATE	CHANGE DESCRIPTION
A	01/15/2026	Initial release