



Service Bulletin

INFORMATION

Subject: Information on Hunter Road Force Balancer

Brand:	Model:	Model Year:		VIN:		Engine:	Transmission:
		from	to	from	to		
All	GM Passenger Cars and Light Duty Trucks	2000	2018				


Involved Region or Country	North America and N.A. Export Regions
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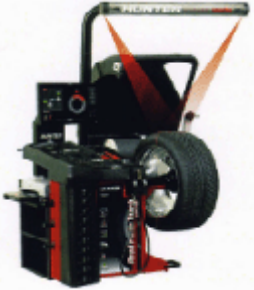

Information

Effective February 2017, a Generation 3, 4 or 5 Hunter Road Force Balancer is designated as Essential Dealer Equipment in the United States. No other wheel balancer will be considered an acceptable substitute in GM Dealers. The Hunter Road Force Balancer allows technicians to perform a static balance and to check Road Force during a single measurement. With the use of the Hunter Road Force balancer, technicians can be sure that the tire/wheel assembly meets or exceeds GM specifications prior to mounting the assembly back onto the vehicle. This ensures that problem(s) can be corrected early in the process. This prevents repeat repairs and customer dissatisfaction in ride quality.

Hunter Generation 3, 4 and 5 Balancers

The Hunter Road Force Balancer was developed over 17 years ago. Currently, the Generation 5 is the latest version available. Any dealer having Generation 3, 4 or 5 balancer, meets the GM requirements. Generation 1 and 2 balancers are not capable of properly measuring and correcting a GM assemblies.

Header	Header	Header	Header
	GSP9722 (Generation 3)	Up to 8 Years Old	180 Match Mount process available Ability to Measure and Correct up to 22" assemblies

	<p>Road Force Touch (Generation 4)</p>	<p>Up to 3 Years Old</p>	<p>Introduces Touch Screen 180 Match Mount process available Handles assemblies up to 175lbs, 40in tire/30in rim</p>
	<p>Road Force Elite Balancer (Generation 5)</p>	<p>Launched February 2016</p>	<p>Touch Screen 180 Match Mount process available Handles assemblies up to 175lbs, 40in tire/30in rim Integrated Power Wheel lift – prevents damage to mounting shaft SmartScan laser measuring system - Eliminates measurement arms Built-in HD video tutorials Weight placement laser and work light Color Printer with storage BullsEye dual-taper 10 collet center kit</p>

Why is the Hunter Road Force Balancer Needed?

Today's cars and trucks have many advanced braking and stability systems. All of these help with better braking and control of the vehicle. Additionally, stricter fuel economy standards are driving many innovations to meet these new standards including lower rolling resistance tires with decreased contact patch. To meet these requirements, suspension systems and tires are getting stiffer and many of today's tire/wheel assemblies can weigh as much as 80 lbs (36 kg). We are also seeing a customer trend for larger wheels in sizes of 20" and 22." Because of this, having properly balanced wheel/tire assemblies and low Road Force tire readings are essential to ride quality. Only by using the Hunter Road Force Balancer will the technician know that the tire/wheel assemblies meet the GM specifications prior to mounting them back on the vehicle.

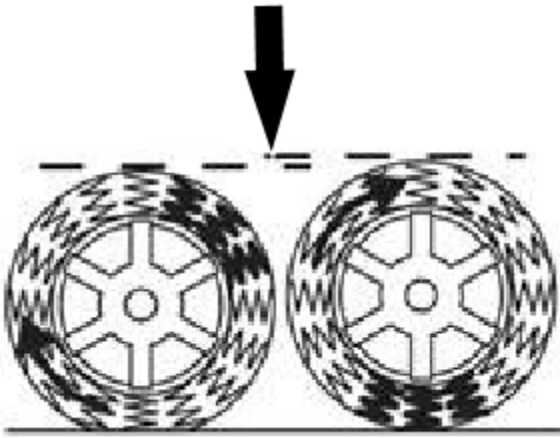
What is Road Force?

Previously, tire/wheel assemblies were measured for "static balance." This allowed for weights to be placed on the inside and outside of the wheel flange/rim surface. While this is the first step, today's vehicles also need the Road Force checked. Road Force is a measurement of both sidewall stiffness and how much the assembly is "Egg Shaped."

What Produces Road Force?

To understand the effects of radial force variation, imagine the tire as a collection of springs between the rim and the tire tread. If the "springs" are of uniform stiffness, a varied force is exerted on the axle as the tire rotates and flexes. This creates a vibration in the vehicle. (Hunter Engineering)

Vibration Source From Radial Force Variation



The Hunter Road Force Balancer has the ability to measure this variation. By measuring, correcting and validating the Tire/Wheel Assembly is in spec for both static and Road Force, the Technician can be assured that the tire/wheel assembly is correct prior to mounting it back on the vehicle. Excessive Road Force can also be produced by incorrect tire mounting or improper bead seating to the rim. Both of these will provide a low and/or high spot in that area. This can occur on either the inside or outside flange. By measuring the Road Force, the Hunter is able to identify a problem before the tire/wheel assembly is mounted back on the vehicle.

Hunter Road Force Balancer for Correcting Customer Complaints

Many of today's GM vehicles have a new design wheel. These new wheels have removed the machined flange that previously would have allowed the traditional "bang-on" weights. This was removed for esthetic reasons but has also driven the need for changes in balancers. Modern balancers need to account for this by allowing wheel weights to be placed on the inside of the wheel. Additionally, the previous method of "vectoring" or "Mat Mounting" a tire cannot be utilized since the starting point is to measure the wheel runout using measurement arms. To address this concern, Hunter has developed the "180-Match Mount" process (https://www.youtube.com/watch?v=_RdmL4-uHh0). This process allows a more precise measurement and correction to the Tire/Wheel Assembly by using the Road Force measurements to determine proper alignment of the tire to the wheel which produces the lowest Road Force. See the section below titled "180 Matching with Flangeless Wheels (Hunter machine)" for more information.

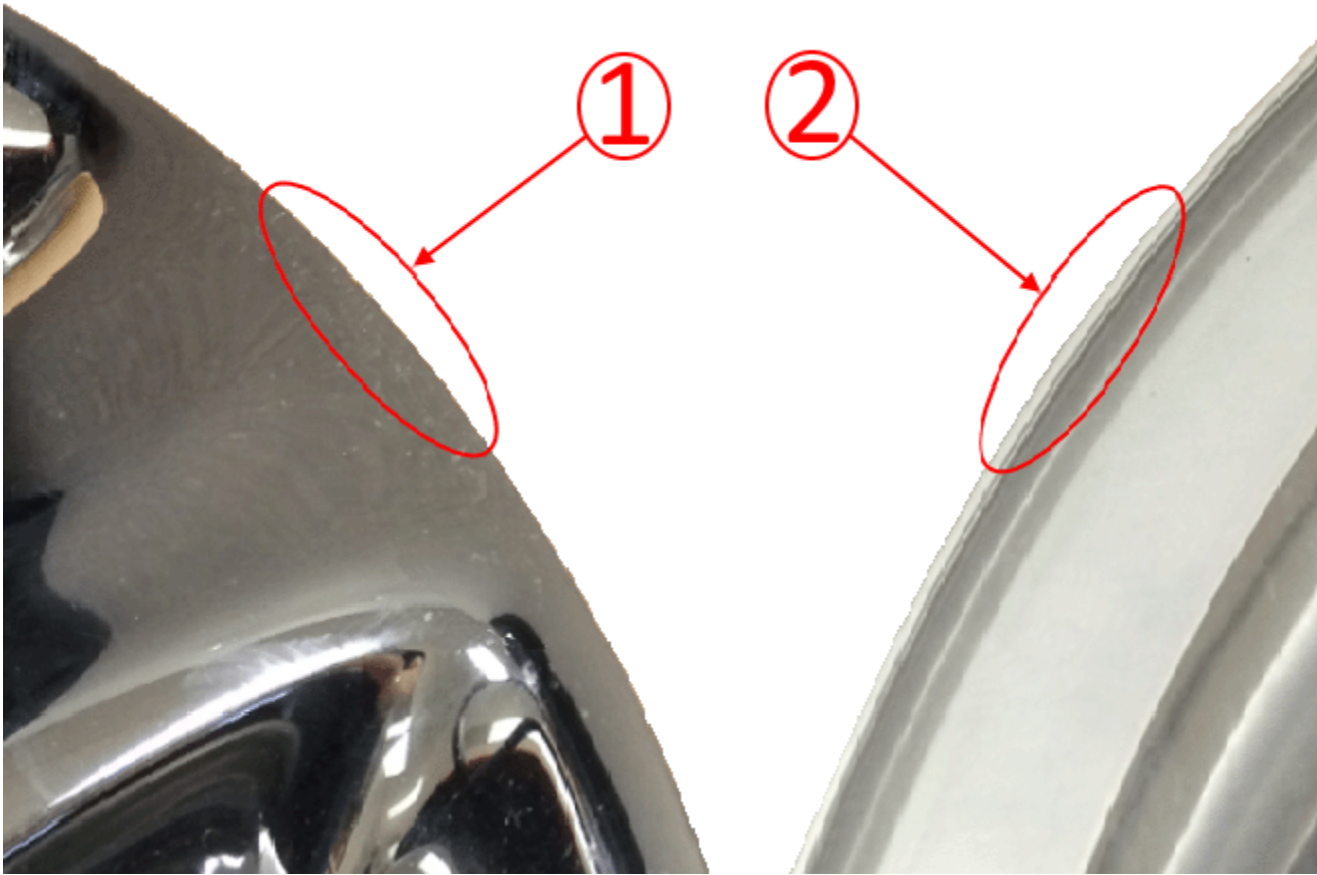
Centering Check

Centering Check is an inspection and verification of the wheel's mounting to the balancer. It is used to identify possible centering errors. These errors can occur with debris or wheel mating surface damage. Both of these can affect the measurement process. The Centering Check procedure identifies these problems prior to performing the balance and Road Force measurement. If an error occurs during the procedure, an error popup will appear with text explaining the error. The Centering Check must be performed on all assemblies to prevent inducing errors in the process.

Measuring Wheel Runout and Assembly Radial Force Variation/180 Matching Procedure (Hunter)

Important: The completed worksheet at the end of this bulletin must be attached to the hard copy of the repair order.

- Measure radial force variation and radial runout.
- Record the radial force variation (RFV) on the worksheet at the end of this bulletin. It may be of benefit to have the lowest RFV assembly to the front left corner.
- Flangeless wheels are commonly used today and the runout cannot be measured accurately with the tire on the wheel. There is no machined surface on the outside of the wheel like on the flanged wheel so for an accurate runout measurement, the wheel should be dismantled and reading should be taken on the inner bead seat area of the wheel or the (Hunter) 180 Matching procedure can be used (see below). The runout spec is the same as a flanged wheel.



1. *Flangeless Rim*

2. *Flanged Rim*

180 Matching with Flangeless Wheels (Hunter machine)

On flangeless wheels, the 180 Matching procedure can be used when using a Hunter 3rd, 4th or 5th generation machine. This can be used with the tire still on the wheel.

Hunter 180 Matching Procedure (this information can also be found in the Hunter manual for your machine):



- 180 Matching will minimize Road Force® in the tire and wheel assembly. It requires a tire changer, as the tire will be repositioned about the wheel during the procedure. The 180 Matching procedure can be launched by touching the Road Force® button, then Procedure and then 180 Matching buttons.



There is a progress bar at the top of the screen to show how far along the procedure has progressed.

1. Mount the assembly on the balancer.
2. Set the tire pressure to the vehicle manufacturer's specification.
3. Lower the hood to start the Road Force® measurement.
4. Position the valve stem at 12:00 and touch "Enter Valve Stem."
5. 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.
6. 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."
7. Lower the hood to start the Road Force® measurement.
8. After the final spin is completed, make marks on the tire and rim as shown on screen and ForceMatch® the assembly.

If match mounting tires to in-spec wheels produces assembly values higher than these, tire replacement may be necessary. Replacing tires at low values will probably mean good tires are being condemned. Because tires can sometimes become temporarily flat-spotted, which will affect force variation, it is important that the vehicle be driven at least 24 km (15 mi) at 89 km (55 mph) or more prior to measuring. Tire pressure must also be adjusted to the usage pressure on the vehicle's tire placard prior to measuring.

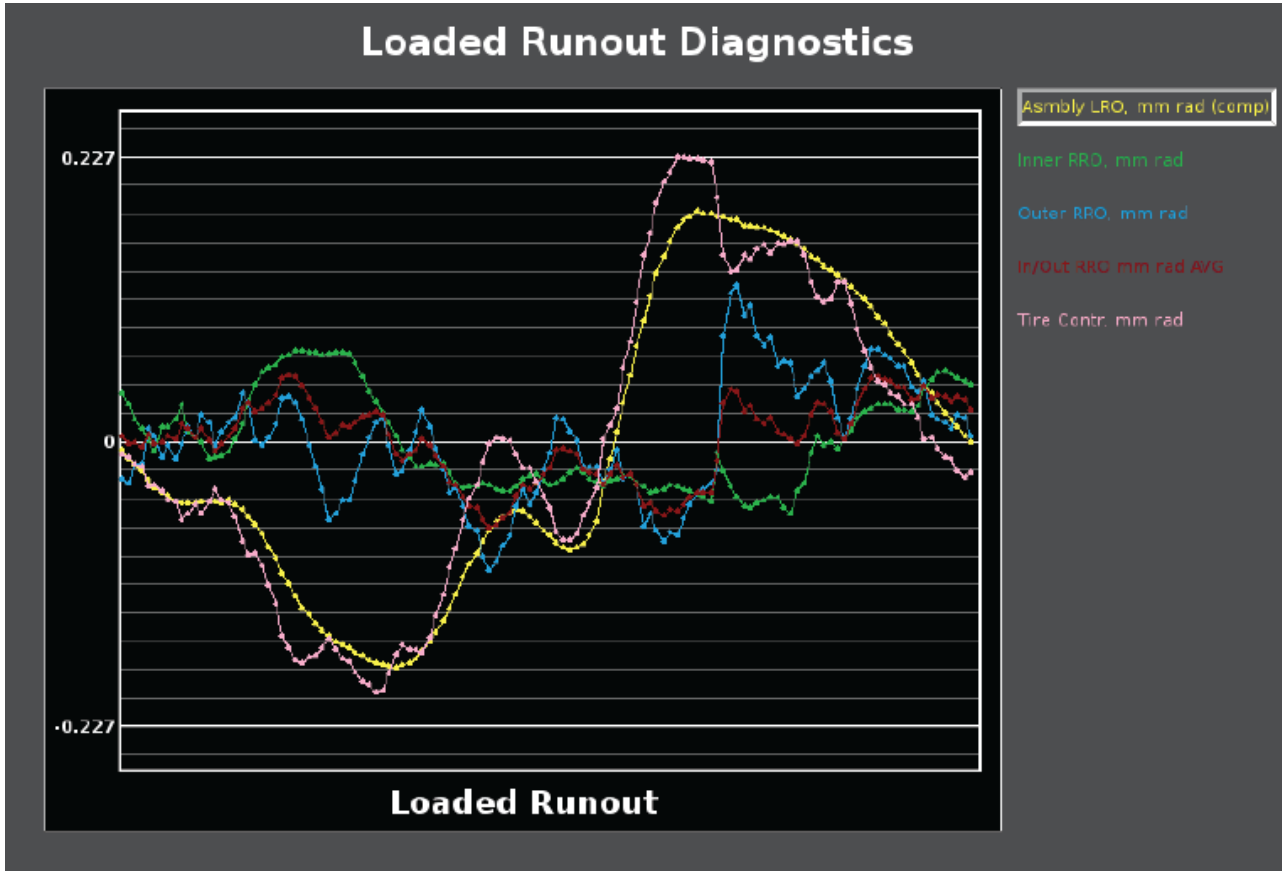
Most GM vehicles will tolerate radial force variation up to these levels. However, some vehicles are more sensitive, and may require lower levels. Also, there are other tire parameters that GM approved tire force variation measurement equipment cannot measure that may be a factor. In such cases, TAC should be contacted for further instructions.

Important:

- When mounting a GM wheel to a wheel balancer/force variation machine, always use the wheel's center pilot hole. This is the primary centering mechanism on all GM wheels; the bolt holes are secondary. Usually a back cone method to the machine should be used. For added accuracy and repeatability, a flange plate should be used to clamp the wheel onto the cone and machine. This system is offered by all balancer manufacturers in GM's dealer program.
- Any type of service equipment that removes tread rubber by grinding, buffing or truing is NOT recommended, and may void the tire warrant. However, tires may have been ground by the tire company as part of their tire manufacturing process. This is a legitimate procedure.
- If the equipment being used is capable of performing a centering check, the centering check must be completed before taking measurement.

of balance or RFV.

Road Force Data and Plots



The Hunter Road Force Balancer allows technicians to review the Road Force Data and Plots that were measured. This allows technicians to determine the high and low spots on the tire. These should be used for a visual inspection when looking for defects or signs of road hazard damage.

Documentation Requirements

The labor times for balancing have been updated to allow additional time for performing the 180 Match Mount process on any assembly/assembly that do not meet the GM Specification. The additional time must be substantiated. For any assembly requiring additional time to perform the Hunter 180 Match Mount, a printout showing the out of specification assembly, must be attached to the Repair Order.

While the above information provides a summary of the Hunter Road Force tool, all users should review the Hunter Road Force User Manual for complete instructions on using the machine. Additionally, the Hunter Road Force Balancer has been integrated into the GM Training curriculum.

Hunter Help

Hunter has also included built in videos for many of the bulletin processes. The Video Player feature provides tips and procedures for using the Road Force® Elite GSP9700

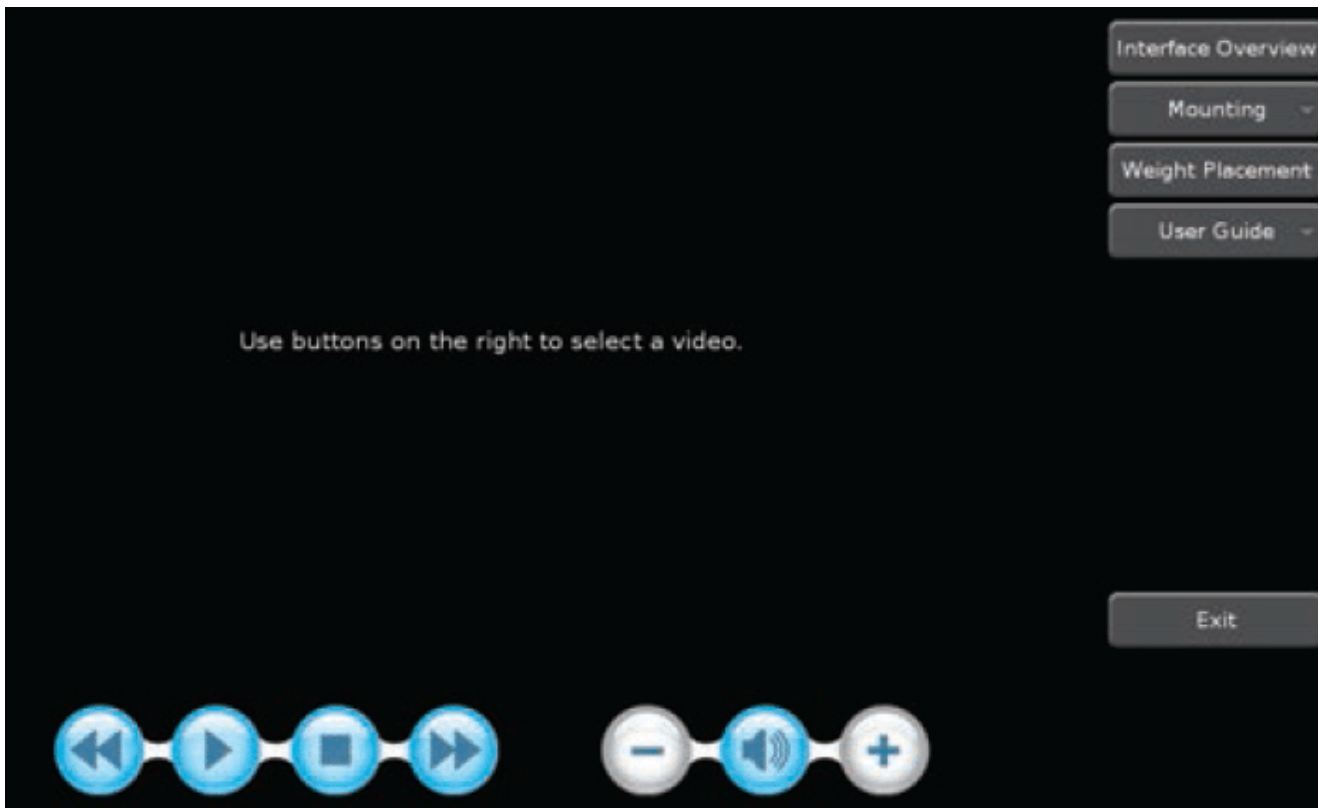
To Access the Video Player:



From the main balance screen, touch the "Help" button



Touch the "Launch Video Player" button.



The main video menu screen is displayed.

Select a topic from the menu to view the video.



The selected video will begin playing.

Vibration Diagnostic Worksheet

<i>Vibration Felt In</i>		
Seat:	Steering Wheel:	Other:

Complaint Speed:	VIN:
Year:	Model:
Symptom:	
Engine:	Engine Speed:
Tire Brand:	Tire Size:
Axle Ratio:	Gear:
TPC Spec:	
<i>Primary</i>	
Frequency:	Type (circle): T1 T2 T3 P1 E1.5 E2
	Other:
Measurement of vibration is Mg's (# of runs? Peak, Average, and Avg of Peaks?)	

Source of Vibration (Based PICO)	

<i>Secondary</i>		
Frequency:	Type (circle): T1 T2 T3 P1 E1.5 E2	
	Other:	
Measurement of vibration is Mg's (# of runs? Peak, Average, and Avg of Peaks?)		

Source of Vibration (Based PICO)		

Condition 1: Road-Force Measurements		
<i>Before Repairs</i>		
	<i>Ounces</i>	<i>Road Force (Lbs)</i>
Right Front		
Left Front		
Right Rear		
Left Rear		
<i>After Repairs</i>		
	<i>Ounces</i>	<i>Road Force (Lbs)</i>
Right Front		
Left Front		
Right Rear		
Left Rear		

Version	1
Modified	

GM bulletins are intended for use by professional technicians, NOT a "do-it-yourselfer". They are written to inform these technicians of conditions that may occur on some vehicles, or to provide information that could assist in the proper service of a vehicle. Properly trained technicians have the equipment, tools, safety instructions, and know-how to do a job properly and safely. If a condition is described, DO NOT assume that the bulletin applies to your vehicle, or that your vehicle will have that condition. See your GM dealer for information on whether your vehicle may benefit from this information.



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