General Service Bulletin (GSB):	Tire Vibration – Equipment Based Diagnostics and Requirements For Warranty Claim Submission
GSB Overview:	This bulletin will assist the dealership with the Ford approved procedure for road force balancing tire/wheel assemblies, based on dealer equipment available.
NOTE: This information is not intended to replace or supersede any warranty, parts and service policy, Work Shop Manual (WSM) procedures, or technical training or wiring diagram information.	

Contents:

INTRODUCTION – WHEEL TO TIRE RUNOUT MINIMIZATION PROCEDURE

To ensure a tire/wheel vibration is the cause of the customer concern, refer to Ford Workshop Manual (WSM) section 100-04 - Diagnosis and Testing

Before a warranty claim can be made on tire(s) with out-of-spec Road Force® or runout measurements, the Wheel to Tire Runout Minimization procedure (sometimes referred to as “match-mounting”, “re-indexing”, or “Road Force® balancing”) found in WSM section 204-04A - General Procedures must be performed. This procedure is designed to optimize a tire’s mounting position on a wheel in order to reduce the total Road Force® or runout of the assembly. The procedure can be performed using either Road Force® measurements (the preferred method) or radial runout measurements. Road Force® measurements are taken using a Road Force® balancer machine, while radial runout measurements are taken using a dial indicator.

The manner in which the Wheel to Tire Runout Minimization procedure is carried out will sometimes vary depending on the model of equipment used. Use this GSB to help identify the equipment type used at your dealership, then follow the instructions outlined for that equipment. If your equipment software does not include the Ford-approved procedure, it may be available through hardware/software upgrades. Contact your local Hunter representative for more details.

DEALER REQUIREMENTS FOR EQUIPMENT BASED DIAGNOSTICS & WARRANTY CLAIM SUBMISSION

CRITERIA FOR ROAD FORCE® BALANCING

- Diagnosis of tire/wheel vibration should not be performed on tires with less than 200 mi (322 km).
- Possible short term tire flat-spotting should be eliminated by driving the vehicle 20 or more miles just prior to taking Road Force® measurements.
- Use one of the following Ford approved Road Force® balancing procedures:
  - Hunter “180 Matching”
  - Ford WSM section 204-04A – General Procedures -- Wheel to Tire Runout Minimization

DEALER REQUIREMENTS FOR EQUIPMENT BASED DIAGNOSTICS & WARRANTY CLAIMS SUBMISSION

REQUIRED PROCESS STEPS FOR DIAGNOSTICS AND SUBMISSION OF A TIRE REPLACEMENT VIBRATION CLAIM

- Determine the equipment type used at your dealership or tire/wheel balancing (reference page 5 for identifying equipment type).
- Refer to appropriate equipment section in this GSB and follow instructions.
- Refer to WSM Section 204-04A – Diagnosis and Testing – Wheels and Tires under the heading “Radial Runout Measurement - Loaded Hunter Road Force® Method” for vehicle-specific specifications.
- Properly mark warranty return tires (reference page 11).
- Use correct Service Labor Time Standards (SLTS) codes (reference page 12).
- Document all diagnostic steps and dial indicator/Road Force® measurements in the technician comments of the warranty claim and on the shop copy of the repair order (reference page 13).

HUNTER EQUIPMENT MODEL IDENTIFICATION

Road Force® Balancer Evolution

HUNTER Engineering Company

	Gen1	Gen2	Gen3	Gen4	Gen5
Model numbers	GSP9702	GSP9712	GSP9722	RFT	RFE
Introduction date	March 9, 1998	May 15, 2001	April 12, 2007	March 16, 2012	April 27, 2016
Identifying features	6 in. roller	9.5 in. roller	LCD monitor	Touch Screen	No dataset arms
Monitor controls	3 knobs	1 knob	1 knob	No knobs	No knobs
Monitor type	Color CRT	Color CRT	Color LCD	Touch Screen	Touch Screen
Printer	Dot matrix	Dot matrix	Color inkjet	Color inkjet	Color inkjet

GSP9700 Gen I:
Small load roller with CRT display
and 3 knobs
and dataset arms

GSP972x Gen III:
Large load roller
with LCD display
and dataset arms

RFE Gen V:
(Elite)

Large load roller,
Touch Screen
and
NO dataset arms

GSP971x Gen II:
Large load roller with CRT display
with buttons below
and dataset arms

RFT Gen IV:
Large load roller
with Touch Screen
and dataset arms

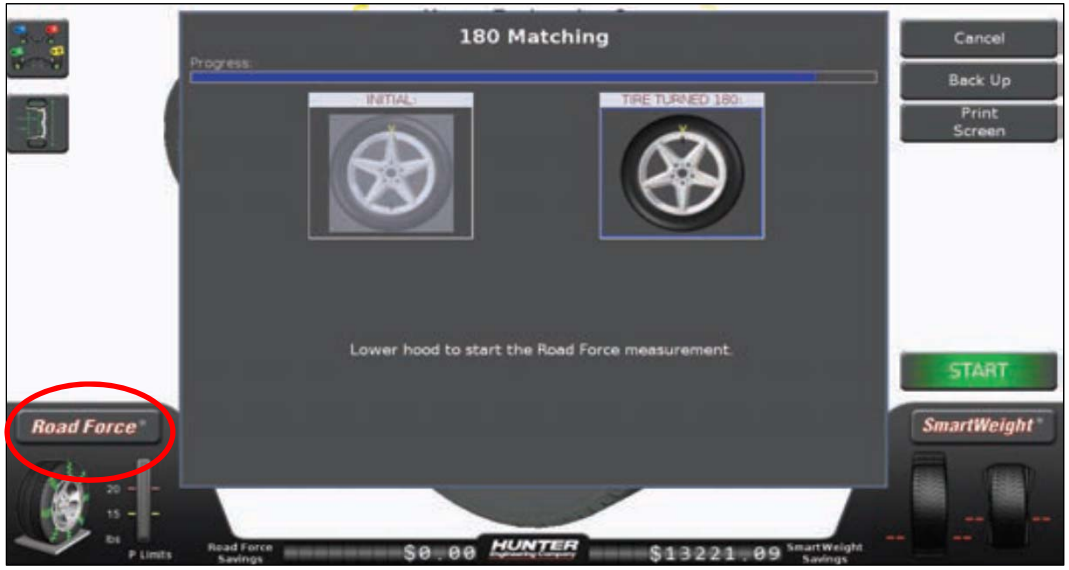
EQUIPMENT TYPE: *Hunter Road Force® Touch / Road Force® Elite* (Generation 4 / Generation 5)

• These balancer models include a procedure for “180 Matching” on the balancer display. This is the only Hunter procedure that matches Ford WSM section 204-04A – General Procedures – Wheel to Tire Runout Minimization.

• A second balancing procedure (it may be the default) likely exists on your equipment. Do not use that procedure. If you can not default your machine to the 180 Matching Procedure, then it will need to be selected each time.

• The 180 Matching Procedure can be launched by selecting the following buttons:

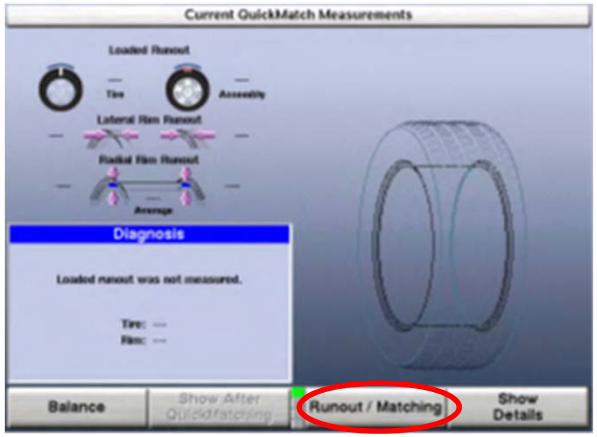
“Road Force®” > “Procedures” > “180 Matching”



EQUIPMENT TYPE: *Hunter GSP9722* (Generation 3)

- This model of balancer may Include a procedure for “Match Without Rim Runout” on the balancer display. If this procedure is not included, then Ford WSM section 204-04A – General Procedures – Wheel to Tire Runout Minimization should be followed.
- Another balancing procedure likely exists on your equipment. Do not use that procedure, only the Hunter “Match Without Rim Runout” and Ford WSM Wheel to Tire Runout Minimization procedure are approved for use on Ford tire/wheel assemblies.
- The “Match Without Rim Runout” procedure should become the machine default setting after you use it the first time. If it does not become the default than you will need to select it each time.
- The “Match without Rim Runout” procedure can be launched by selecting the following:

“Show Runout & QuickMatching” -- “Runout/Matching” -- “Match Without Rim Runout”



EQUIPMENT TYPE: *Hunter GSP9712* (Generation 1 / Generation 2)

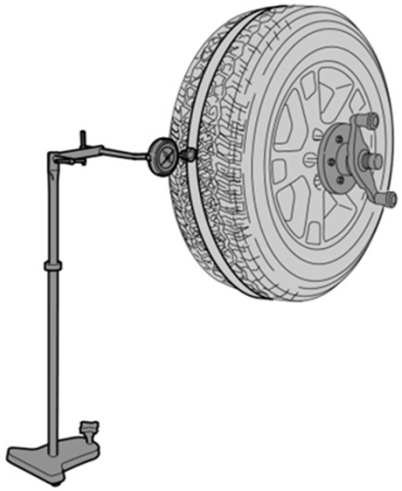
- These balancer models do not include software that follows the Ford Workshop Manual methodology
- The match-mounting procedures in the software of these models should not be used. Instead, only the Wheel to Tire Runout Minimization procedure found in WSM section 204-04A – General Procedures, should be used.
- Use these machines only to gather the necessary Road Force® measurements. Do not follow the prompts that appear for match-mounting.

EQUIPMENT TYPE: Other Brands/Models of Balancer Equipment

- Non-Hunter brand balancers will not include the Ford-approved procedure for match-mounting in their software.
- Other balancing procedures that exist on non-Hunter brand equipment are not Ford approved and should not be used.

EQUIPMENT TYPE: Dial Indicator (Use Only When Road Force® Equipment is Not Accessible)

- Radial runout measurements can be taken using a dial indicator, if the preferred Road Force® balancing equipment is not available.
- Refer to WSM section 204-04A – Diagnosis and Testing – Wheels and Tires under the heading “Radial Runout Measurement – Dial Indicator Method” for the approved process.



NOTE: Loaded run-out measurements are the preferred method for verifying tire serviceability. While a dial indicator can be used to optimize the position of the tire on the wheel, these “unloaded” run-out measurements cannot accurately determine if the tire should be removed from service.

MARKING TIRES PROPERLY FOR WARRANTY RETURN

Any tire replaced under warranty must be marked with two Road Force® measurements and their locations as outlined in the Wheel to Tire Runout Minimization procedure in WSM Section 204-04A – General Procedures. Refer to Warranty & Policy Manual Section 3 for warranty requirements.

Each tire should be marked as indicated in the image where:
① is the location of the initial measurement, and
② is the location of the second measurement, taken after rotating the tire 180° on the wheel.
The numbers “43” and “41” in the image are the Road Force® values in pounds for each of the two measurements.

VIBRATION SERVICE LABOR TIME STANDARDS (SLTS) CODES DEFINITION AND USAGE

Labor Op Code Definitions And Usage

1015D	Wheel and Tire - Balance (balance only - for when runout/road force is within spec and so match mounting is not required)
1007D11	Tire and Wheel Assembly - Check Runout/Road Force, and Balance (measure the road force or runout of the assembly and balance)
1007D12	Tire and Wheel Assembly - Match Mount (Perform "Wheel to Tire Runout Minimization" procedure from Ford Workshop Manual)
1007D13	Wheel(s)/Tire(s) - Replace for Vibration (Replace wheel(s)/tire(s) when found to be out of spec per 204-04A of Workshop Manual)

ACCEPTABLE DOCUMENTATION FOR TECH COMMENTS SECTION OF THE WARRANTY CLAIM

Requirement: All Road Force® or dial indicator measurements taken should be included in the warranty claim, as well as on the repair order shop copy. Refer to the Warranty & Policy Manual Section 1 for warranty requirements.

Note: Document Road Force® measurements in the following positional order: LF, RF, RR, LR. After re-indexing, use an "NA" designation in any positions that did not require re-measurement and record in the same order.

EXAMPLES OF ACCEPTABLE TECH COMMENTS FOR EACH BALANCING PROCESS

Hunter 180 Matching Process:

Drove Vehicle– 23mi, Verified Vibration. Spec 25 lb, Initial Road Force 38,51,66,31. Re-index 180 - 14,39,40,27. Hunter Match Mount – NA,29,32,12. Replace 2 Tires.

Ford WSM-Road Force® Balancing Process:

Drove Vehicle - 20mi, Verified Vibration. Spec 35 lb, Initial Road Force 46,12,18,58. Re-index Tire 180 - 26,NA,NA,46. Re-index 90 per WSM Instruction – NA,NA,NA,41. Replaced 1 Tire.

Ford WSM-Dial Indicator Process (runout measurements in inches):

Drove Vehicle - 21mi, Verified Vibration. Spec 1.14 mm (0.045 in), Initial Measurements (in.) 0.107, 0.086,0.043,0.031. Re-index Tire 180 - 0.081,0.078,NA,NA. Re-index 90 per WSM Instructions – 0.085,0.041,NA,NA. Replace 1 Tire.

EQUIPMENT SETTINGS AND CALIBRATION

It is important to run daily calibration checks on tire balancer equipment and re-calibrate when indicated. Most modern balancers utilize a calibration weight stored on the back of the machine. The weight is installed on the balancer's faceplate during calibration and a "calibrate" option is selected from the machine's menu. For specific instructions, reference the machine's user manual.