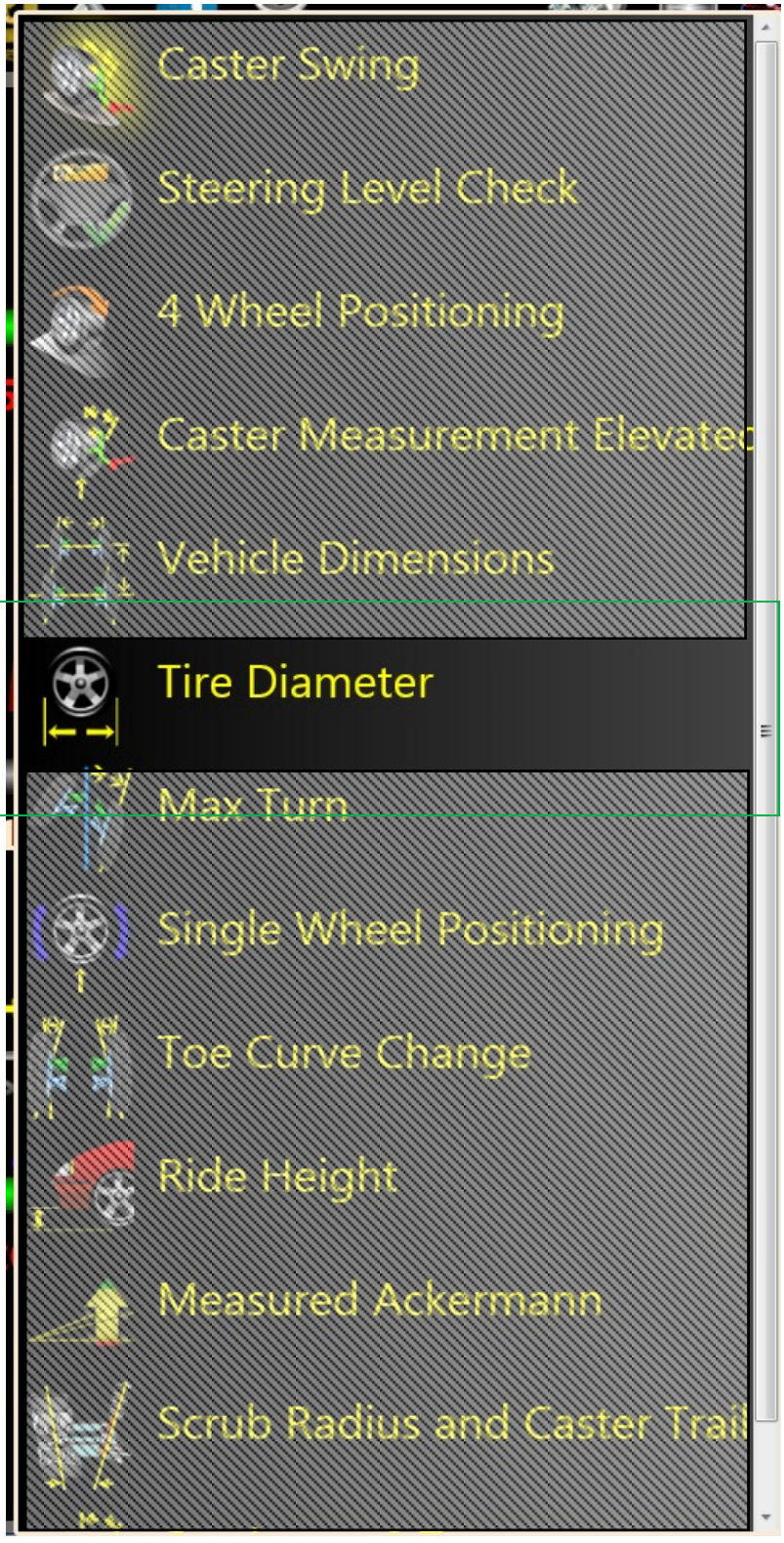
Why we are the best in the industry: Tire diameter measurement

Tire diameter measurement allows the alignment technician to quickly measure and determine if the vehicle's tire meet the manufacturer's overall tire diameter. This is especially important in the case of AWD propelled vehicles.

Yes a large difference in overall tire diameter can impose undue mechanical stresses on certain drivetrain components and result in catastrophic failures.



Why we are the best in the industry: Tire diameter measurement

Topic:

Overall tire diameter is an important factor in vehicle performance. Mismatched tires can cause drivetrain mechanical damage and lead to expensive repairs not covered under the vehicle manufacturer's warranty.

AWD vehicle manufacturers provide specific dimensions relative to overall tire diameters . These specifications are included in the owners manual under tire and servicing.

Here is an example of a Chrysler TSB

TSB reference number

Subject matter

Important information

Read this

ALL WHEEL DRIVE POWER TRANSFER UNIT FAILURE

TECHNICAL SERVICE BULLETIN

Reference Number(s): 21-05-00, Date of Issue: July 28, 2000
Related Ref Number(s): 21-05-00

ARTICLE BEGINNING

ALL WHEEL DRIVE POWER TRANSFER UNIT FAILURE

Model(s): 1996-2000 Chrysler (NS) Town & Country: 1996-2000 Dodge (NS) Caravan: 1996-2000 Plymouth (NS) Voyager: 1996-2000 Chrysler (GS) Voyager (International Markets): 2001 Chrysler (RS) Town & Country: 2001 Dodge (RS) Caravan: 2001 Plymouth (RS) Voyager: 2001 Chrysler (RG) Voyager (International Markets)

Group: Transmission

Bulletin No.: 21-05-00

Date: July 28, 2000

DISCUSSION

The All Wheel Drive (AWD) system used on Minivans uses a Power Transfer Unit (PTU) that connects the front drive components to the rear drive components. The PTU may fail if identical tires are not used on all four wheels. This kind of PTU failure is the result of extreme heat build up caused by a continuous difference of rotation speeds and torque transfer between the front and rear drive components when different size tires are used on the front wheels versus the rear wheels.

A difference in tire circumference measurements as small as 0.5% is enough to cause a PTU failure PTU failures related to mismatched tires are not warrantable.

Important points to be remembered and to remind AWD minivan vehicle operators:

- Tires should be rotated every 7,500 miles or less to maintain even tread wear.
- Correct tire air pressure must be maintained.
- When tire replacement is necessary all 4 tires must be replaced with a matched (same manufacturer, model, and size) set.

WARRANTY INFORMATION

POLICY: Information Only.

Why we are the best in the industry: Tire diameter measurement

Here is an example of a Subaru TSB

Read this

SUBARU

Vehicles ▼ | Why Subaru ▼ | Financial Tools ▼ | For Owners ▼ | Build Your Own

MySubaru

Frequently Asked Questions

1. Can I use a cell phone in my Subaru using the cigarette lighter outlet?
You can use the in-dash receptacle as an accessory plug. BUT ONLY IF IT IS NOT ALSO USED AS A CIGARETTE LIGHTER.

If the in-dash lighter receptacle is ever used for a plug-in accessory such as a cellular phone, it may damage the portion of the receptacle's internal mechanism (bi-metal) that causes the cigarette lighter plug to "pop-out" after its lighter element is heated. Placing a lighter plug in a receptacle that has been damaged by a plug-in accessory may cause the plug to stick and overheat, which may in some cases cause a fire in the receptacle that can spread to surrounding areas.

Therefore, if the lighter socket is used even once for an accessory plug-in item, then it must not ever be used to operate the cigarette lighter element. The entire socket must be replaced if you, the customer, ever wants to use it as a cigarette lighter again.

2. How do I properly break-in the engine in my new Subaru?
Your Owner's Manual indicates specific suggestions for the first 1000 miles, which will aid in the performance and long life of your vehicle. Obviously, how you handle and care for your vehicle will play a major role in its longevity. Among the suggestions are: (1) do not race the engine. (2) Never exceed 4,000-rpm engine speed except for brief acceleration in an emergency. (3) Do not drive at one constant engine or vehicle speed for a long time, either fast o slow. (4) Avoid starting suddenly and rapid acceleration, except in an emergency. (5) Avoid hard braking, except i an emergency.

3. Can I change the tire size on my AWD Subaru?
We recommend that you replace the tires on your Subaru with the same brand of tires as originally equipped, as they were chosen specifically for your vehicle. Also, we STRONGLY recommend that you replace them with the same size/style as originally equipped. Finally, we recommend that you refer to the information in your owner's manual regarding tires.

4. Do I have to replace all four tires on my AWD Subaru?
All of the tires on your AWD Subaru must be within 1/4 of an inch of rolling circumference (part that touches the road). This is because of our All Wheel Drive System.

Proper rotation of the tires at the appropriate service intervals will increase the life expectancy of your tires. This will also ensure that all four tires stay relatively equal in their tire tread wear. When vehicles are serviced, tires should be routinely checked to ensure that the alignment and tires are in good working condition.

Why we are the best in the industry Tire diameter measurement

Here is an example of a Ford TSB

4 WHEEL DRIVE/ALL WHEEL DRIVE—WITH CONTROL TRAC —SHUDDER ON ACCELERATION/DECELERATION OR BINDING ON SLOW TURNS	TSB 08-21-11

FORD:
1997-2008 Expedition, Explorer
2006-2008 F-150
2007-2008 Explorer Sport Trac
2008 F-150

LINCOLN:
1998-2008 Navigator
2003-2005 Aviator

MERCURY:
2005 Mountaineer
2006-2008 Mountaineer

Read this →

ISSUE
Various 1997-2008 vehicles equipped with either 4 wheel drive or all wheel drive and equipped with control trac may exhibit a shudder on acceleration/deceleration, binding in slow speed turns or noise from the front driveline and/or transfer case. The shudder/binding will occur with the vehicle being operated in the awd/auto 4x4 mode. The shudder/binding may be due to incorrect tire circumference or improper tire inflation pressures.

ACTION
Follow the Service Procedure steps to correct the condition.

SERVICE PROCEDURE

NOTE
THIS DOES NOT APPLY TO 2006-2008 MOUNTAINEER WITH A 4.0L ENGINE OR 2007-2008 EXPLORER AND SPORT TRAC WITH 20 INCH WHEELS.

Read this →

NOTE
VEHICLES ON THE LIST MAY REQUIRE REPLACEMENT OF TIRE/S IF THE TIRE CIRCUMFERENCE AVERAGE BETWEEN THE FRONT AND REAR AXLES ARE OUTSIDE OF THE 1/2 INCH SPECIFICATION OR IF THE TIRE CIRCUMFERENCE FROM SIDE TO SIDE ON EITHER AXLE EXCEEDS 1/2 INCH DIFFERENCE, THE SMALLER TIRE(S) MUST BE REPLACED.

NOTE
REVIEW THE WARRANTY AND POLICY MANUAL FOR FORD MOTOR COMPANY TIRE REPLACEMENT WARRANTY BEFORE PERFORMING THE SERVICE PROCEDURE.

NOTE
ONLY USE REPLACEMENT TIRE AND WHEEL THAT ARE THE SAME SIZE, LOAD INDEX, SPEED RATING AND TYPE (SUCH AS P-METRIC VERSUS LT-METRIC OR ALL-SEASON VERSUS ALL-TERRAIN) AS THOSE ORIGINALLY PROVIDED BY FORD. THE RECOMMENDED TIRE AND WHEEL SIZE MAY BE FOUND ON EITHER THE SAFETY COMPLIANCE CERTIFICATION LABEL OR THE TIRE LABEL WHICH IS LOCATED ON THE B-PILLAR OR EDGE OF THE DRIVER'S DOOR.

NOTE
ON SOME 4WD MODELS, THE INITIAL SHIFT FROM 2WD TO 4WD WHILE THE VEHICLE IS MOVING CAN CAUSE A MOMENTARY CLUNK AND/OR BRIEF RATCHETING SOUND. THESE SOUNDS ARE NORMAL AS THE FRONT DRIVETRAIN COMES UP TO SPEED AND IS NOT CAUSE FOR CONCERN.

1. Review the tire label for correct tire size and tire inflation pressures located at the B-Pillar of the driver's door.
2. If the tire size does not match the label, this procedure does not apply, follow normal Workshop Manual (WSM) diagnostics.

Why we are the best in the industry: Tire diameter measurement

Here is an example of a Ford TSB

TSB 08-21-11 (Continued)

3. If the tire size is correct, ensure tire pressures are within specifications.
4. Raise the vehicle on the hoist, refer to Workshop Manual, Section 100-02.
5. Disconnect all wiring going to the transfer case and road test.
6. Is the shudder/binding present?
   a. If the shudder/binding is still present, do not contine with this procedure, continue with WSM normal diagnostic for 4X4.
   b. If the shudder/binding is gone, proceed to Step 7.
7. Raise the vehicle on the hoist and reconnect all the wiring previously disconnected.
8. Using a tailor's tape or flexible measuring tape and measure the circumference of all four (4) tires and record the measurements. (Figure 1)

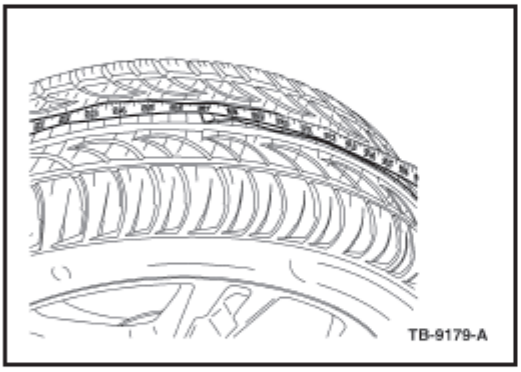


Figure 1 - Article 08-21-11

9. Calculate the average of the circumference of the two (2) front tires and calculate the average of the circumference of the two (2) rear tires. (Figure 2)

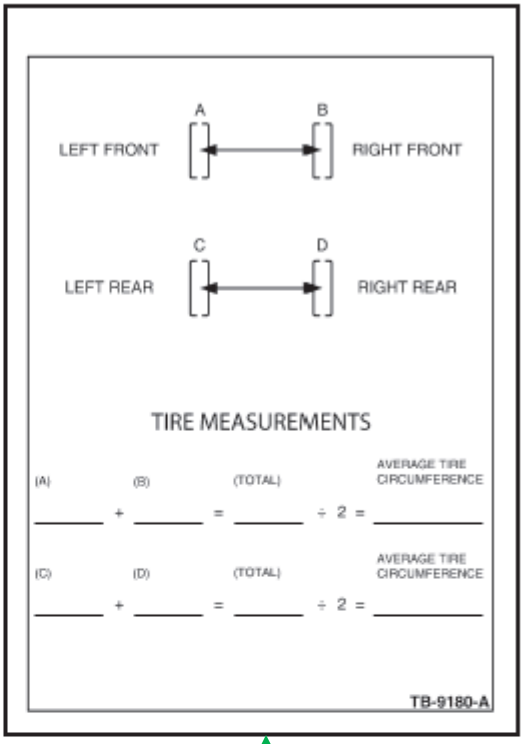


Figure 2 - Article 08-21-11

10. If the difference between these two averages is greater than 1/2″ (12.7 mm), front to back or side to side, replace the smallest circumference tire(s) and remeasure the tire averages. Refer to WSM, Section 204-04 for tire replacement.

NOTE
WARRANTY COVERAGE ELIGIBILITY STARTS WITH 2007 NEW VEHICLE LIMITED WARRANTY COVERAGE.

WARRANTY STATUS: Eligible Under Provisions Of New Vehicle Limited Warranty Coverage
IMPORTANT: Warranty coverage limits/policies are not altered by a TSB. Warranty coverage limits are determined by the identified causal part.

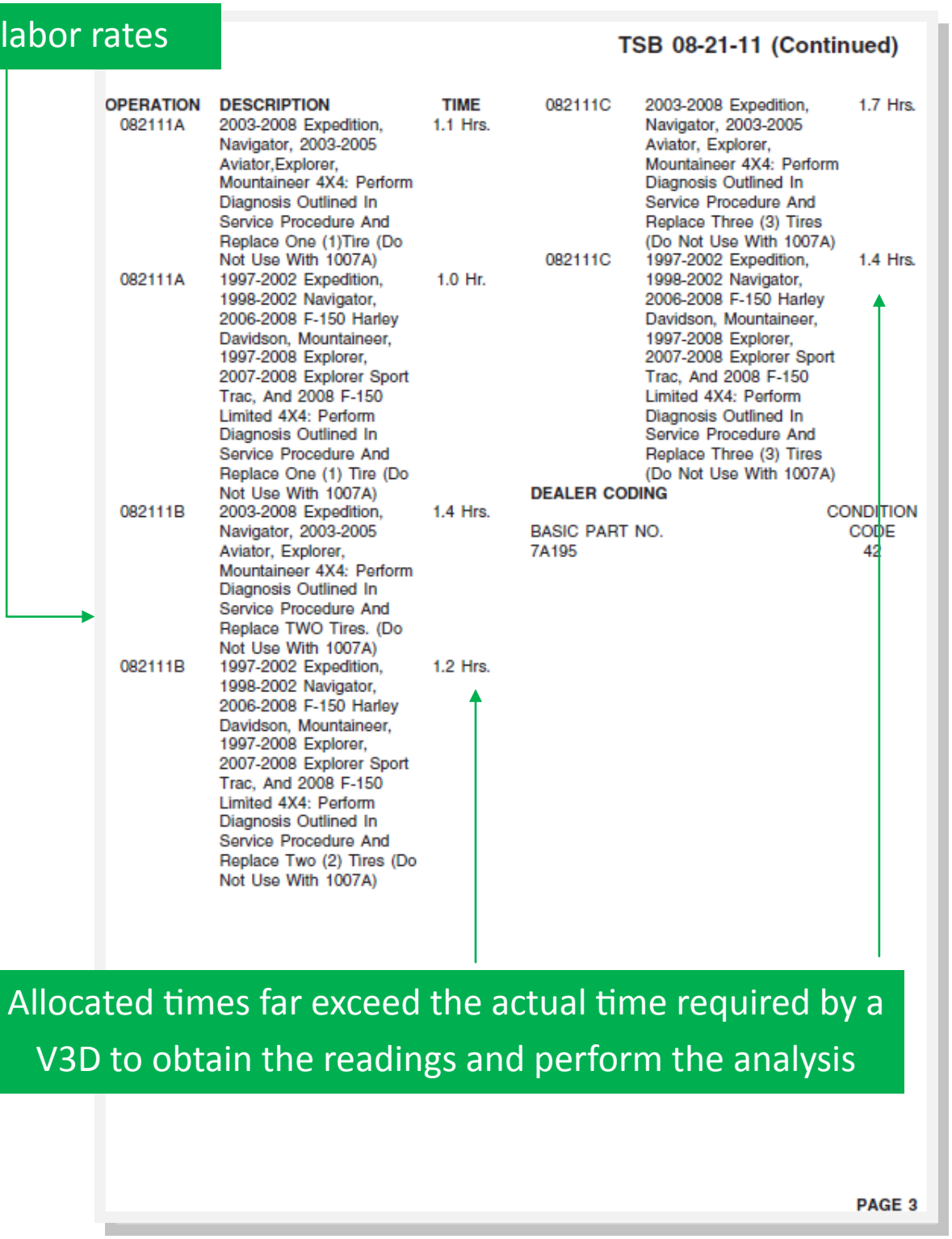
PAGE 2

They recommend using a tape measure

Manually enter the data and perform the calculations

Why we are the best in the industry: Tire diameter measurement

Warranty labor rates



TSB 08-21-11 (Continued)

OPERATION	DESCRIPTION	TIME
082111A	2003-2008 Expedition, Navigator, 2003-2005 Aviator,Explorer, Mountaineer 4X4: Perform Diagnosis Outlined In Service Procedure And Replace One (1)Tire (Do Not Use With 1007A)	1.1 Hrs.
082111A	1997-2002 Expedition, 1998-2002 Navigator, 2006-2008 F-150 Harley Davidson, Mountaineer, 1997-2008 Explorer, 2007-2008 Explorer Sport Trac, And 2008 F-150 Limited 4X4: Perform Diagnosis Outlined In Service Procedure And Replace One (1) Tire (Do Not Use With 1007A)	1.0 Hr.
082111B	2003-2008 Expedition, Navigator, 2003-2005 Aviator, Explorer, Mountaineer 4X4: Perform Diagnosis Outlined In Service Procedure And Replace TWO Tires. (Do Not Use With 1007A)	1.4 Hrs.
082111B	1997-2002 Expedition, 1998-2002 Navigator, 2006-2008 F-150 Harley Davidson, Mountaineer, 1997-2008 Explorer, 2007-2008 Explorer Sport Trac, And 2008 F-150 Limited 4X4: Perform Diagnosis Outlined In Service Procedure And Replace Two (2) Tires (Do Not Use With 1007A)	1.2 Hrs.
082111C	2003-2008 Expedition, Navigator, 2003-2005 Aviator, Explorer, Mountaineer 4X4: Perform Diagnosis Outlined In Service Procedure And Replace Three (3) Tires (Do Not Use With 1007A)	1.7 Hrs.
082111C	1997-2002 Expedition, 1998-2002 Navigator, 2006-2008 F-150 Harley Davidson, Mountaineer, 1997-2008 Explorer, 2007-2008 Explorer Sport Trac, And 2008 F-150 Limited 4X4: Perform Diagnosis Outlined In Service Procedure And Replace Three (3) Tires (Do Not Use With 1007A)	1.4 Hrs.

DEALER CODING

BASIC PART NO.	CONDITION CODE
7A195	42

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Allocated times far exceed the actual time required by a V3D to obtain the readings and perform the analysis

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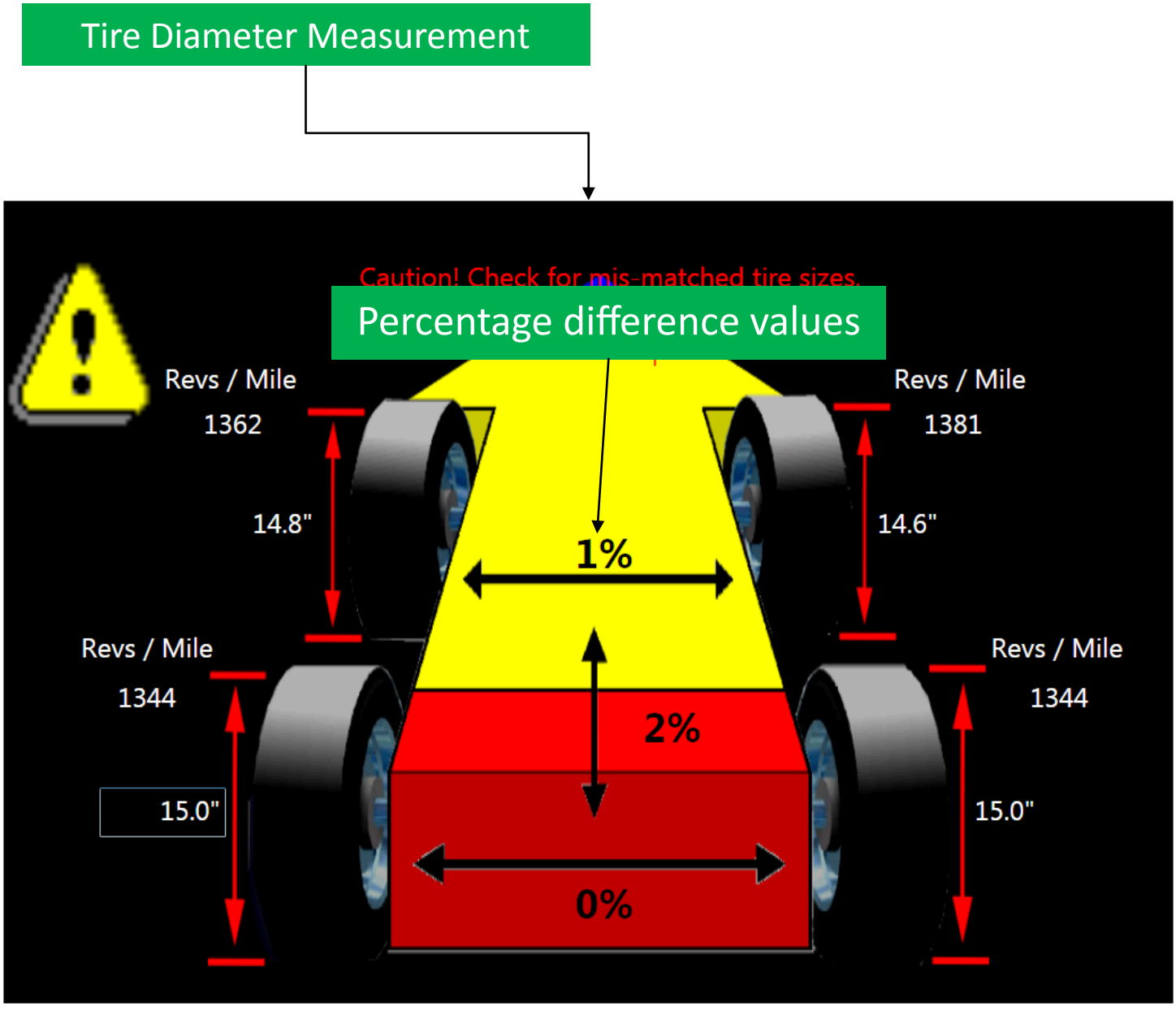

- Unique feature only available on John Bean wheel alignment equipment. Diameter differences displayed in percentage and inches
- Values obtained after roll back
- Time to obtain the values less than 2 minutes