



Countries:	BRAZIL, CANADA, UNITED STATES, PUERTO RICO	Document ID:	IK0400033
Availability:	ISIS, Bus ISIS, FleetISIS	Revision:	3
Major System:	BRAKES	Created:	12/20/2006
Current Language:	English	Last Modified:	3/11/2014
Other Languages:	Portuguese ,	Author:	James Santos
Viewed:	1195		

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Coding Information

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Title: Automatic Traction Control Tire Size Compatibility

Applies To: Vendor: Bendix

DESCRIPTION

For all vehicles equipped with Bendix automatic traction control systems, compatible tire sizes are necessary for proper performance of the traction control system. The automatic traction control feature is included with codes 04AZD and 04AZJ.

The Bendix automatic traction control system includes an Electronic Control Unit (ECU) that monitors the rotational speed of the right and left steering axle wheels and right and left rear drive axle wheels on one drive axle. In the traction control mode, the rotational speed (RPM) of the rear wheels is compared to the rotational speed (RPM) of the front wheels. If either or both of the rear drive wheels are rotating at a faster rate than the front steering wheels, the ECU "thinks" rear wheel slippage is occurring and the ECU traction control strategy turns ON the Instrument Panel Light and reduces power to the drive axles until at least one of the rear wheels rotational speed is the same as the front wheels. However, if one of the rear wheels continues to rotate faster than the front wheels and the drive wheels on the opposite side, the ECU selectively applies the brake on the "slipping" wheel, which transfers power to the opposite wheel which is not slipping.

Different tire part numbers often have a different Revolutions-Per-Mile (REVS- PER-MILE) specification, even within a given tire size. For example, with the 11R22.5 tire size, the variation among the different tire types and vendors results in a REVS-PER-MILE range of 487 to 507, which is nearly a four percent difference within that particular size. The Bendix system requires the tire **REVS-PER-MILE TOLERANCE for all tires on the vehicle be within 3 percent of the smallest tire size on the vehicle.**

The ECU is continuously monitoring the rotational speed of both the front wheels, and the right and left driving wheels on one drive axle, then comparing their rotational speeds. If a vehicle has front tires larger than the rear tires, the front tires will rotate slower than the rear tires. If the difference (REVS-PER-MILE) is more than the three percent tolerance, the ECU will interpret that difference in rotational speed as "rear wheel slip" and will reduce engine power to try to eliminate that wheel slip. A traction control equipped vehicle with mis-matched tires, either front to rear or side to side on an axle may experience reduced engine power because the traction control system is trying to control what the ECU interprets as wheel slip. **Under-inflated tires can also cause different rotational rates (in addition to increasing tire wear).**

When "specing" tires for a traction control equipped vehicle, it is important to determine whether the tire size compatibility is within the 3 percent tolerance that is necessary.

DETERMINING TIRE SIZE COMPATIBILITY

1. If the front and rear tires are the same part number, the tire sizes are compatible.
2. If the front and rear tires are not the same part number, do the following: Refer to the CT-400 Component Book, Group 27/32 for REVS-PER-MILE for the front and rear tire part numbers being used on the vehicle. See Note 1.

a. If the REVS-PER-MILE are the same for the selected front and rear tire part numbers, the tire sizes are compatible.

b. If the REVS-PER-MILE are **NOT** the same for the selected front and rear tire part numbers, perform the following calculations to determine if the tire sizes are compatible:

FRONT REVS-PER-MILE minus REAR REVS-PER-MILE equals REVS-PER-MILE DIFFERENCE (See Note 2.)

Example:

Front Tires 7302210179 10R22.5 (G159) REVS-PER-MILE = 518

Rear Tires 730210192 10R22.5 (G124) REVS-PER-MILE = 514

REVS-PER-MILE DIFFERENCE = 4

Calculate REVS-PER-MILE TOLERANCE:

REVS-PER-MILE (smallest of the two values) x .03=REVS-PER-MILE TOLERANCE

Example:

514 x .03=15.42 REVS-PER-MILE TOLERANCE

The REVS-PER-MILE DIFFERENCE of 4 is less than the REVS- PER-MILE TOLERANCE of 15.2: the tire sizes are compatible.

If the REVS- PER-MILE TOLERANCE would have been a figure larger than 15.2, the tire sizes would not be compatible with the requirements of the Automatic Traction Control System.

NOTE:

1: Consult your local tire dealer for REVS-PER-MILE data not included in the CT-400 Component Book.

2: Disregard a minus sign if the front REVS-PER-MILE is smaller than the rear REVS- PER-MILE.

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